



Dell EMC XtremIO Storage Array

X1 and X2 Cluster Types

XMS Versions 6.3.0 and 6.3.1

**XIOS Versions 4.0.15, 4.0.25, 4.0.26, 4.0.27, 4.0.31, 6.0.0, 6.0.1, 6.0.2, 6.1.0,
6.2.0, 6.2.1, 6.2.2, 6.3.0 and 6.3.1**

RESTful API (Ver. 3.1) Guide

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Introduction

This document provides information on using the RESTful API with the XtremIO Storage Array.

Topics include:

- ◆ Introduction 5
- ◆ Using the XtremIO RESTful API.....11
- ◆ User Roles.....35
- ◆ Basic Cluster Management Flow 36
- ◆ RESTful Response Codes 37
- ◆ Supported Objects 38
- ◆ Advisory Notices 44
- ◆ Alerts.....55
- ◆ Alert Definitions.....61
- ◆ BBUs.....68
- ◆ Clusters.....78
- ◆ Consistency Groups.....102
- ◆ Consistency Group Copies 137
- ◆ DAEs 140
- ◆ DAE Controllers.....148
- ◆ DAE Row Controllers.....157
- ◆ DAE PSUs 168
- ◆ Data Protection Groups.....176
- ◆ Debug Information Log Bundles 182
- ◆ Discover Initiators.....187
- ◆ Email Notifiers.....191
- ◆ Events 197
- ◆ InfiniBand Switches 203
- ◆ Initiators 217
- ◆ Initiators Connectivity.....234
- ◆ Initiator Groups.....239
- ◆ iSCSI Portals and Routes.....254
- ◆ LDAP Configurations.....270
- ◆ Local Disks 279
- ◆ Local Protections 286

♦ LUN Mapping	301
♦ NVRAM.....	311
♦ Performance	318
♦ Quality of Service (QoS) Policies.....	353
♦ Remote Protection Domains	363
♦ Remote Protection Consistency Group	372
♦ Remote Protection IP-Links	376
♦ Remote Protection Ports.....	388
♦ Remote Protection Sessions	393
♦ Remote Protection Volumes	419
♦ Remote Snapshot Sets.....	424
♦ Retention Policies	432
♦ Schedulers	447
♦ Secure Remote Services Notifiers	463
♦ Slots	472
♦ Snapshot Groups.....	478
♦ Snapshot Sets	487
♦ SNMP Notifier	504
♦ Storage Controllers	510
♦ Storage Controller PSUs.....	535
♦ SSDs.....	543
♦ SYSLOG Notifier	556
♦ Tags	562
♦ Targets	572
♦ Target Groups.....	588
♦ User Accounts.....	596
♦ Volumes.....	604
♦ Volume Copies	637
♦ Volume Pairs.....	639
♦ Volumes Savings	646
♦ X-Bricks.....	649
♦ XEnvs	656
♦ XMS.....	662
♦ Appendix A – RESTful API Versions	674

Introduction

- ♦ Appendix B – RESTful API Changes.....692
- ♦ Appendix C – RESTful API Examples 744
- ♦ Appendix D –RESTful API Best Practices 767
- ♦ Troubleshooting and Getting Help 769

Introduction

XtremIO Product Description

XtremIO is an all-flash storage array that has been designed from the ground-up to unlock flash's full performance potential and deliver array-based capabilities that leverage the unique characteristics of SSDs, based on flash media.

XtremIO uses industry standard components and proprietary intelligent software to deliver unparalleled levels of performance. Achievable performance ranges from hundreds of thousands to millions of IOPS, and consistent low latency of under one millisecond *

The system is also designed to provide minimal planning, with a user-friendly interface that makes provisioning and managing the array very easy. The XtremIO Management Server (XMS) can manage one or more XtremIO clusters.

XtremIO leverages flash to deliver value across the following main dimensions:

- ♦ **Performance** – Regardless of how busy the system is, and regardless of storage capacity utilization, latency and throughput remain consistently predictable and constant. Latency within the array for an I/O request is typically far less than one millisecond.*
- ♦ **Scalability** – XtremIO storage can be expanded for only capacity (scale-up) or both capacity and performance (scale-out). The XtremIO cluster is based on building blocks called X-Bricks. Each X-Brick is constructed of two Storage Controllers and a Disk Array Enclosure (DAE). The system begins with an X-Brick with a minimum of 18 SSDs. When more capacity is required, the system scales-up, with up to 72 SSDs per X-Brick. When additional performance and capacity is required, the system can be scaled-out by adding X-Bricks. Performance scales linearly, ensuring that two X-Bricks can deliver twice the IOPS of a single X-Brick configuration, three X-Bricks deliver three times the IOPS, four X-Bricks deliver four times the IOPS, and so on. Latency remains consistently low as the system scales-out.

* As measured for small block sizes. Large block I/O by nature incurs higher latency on any storage system.

Introduction

- ♦ **Efficiency** – The core engine implements content-based Inline Data Reduction. The XtremIO Storage Array automatically reduces (deduplicates and compresses) data on the fly, as it enters the system. This reduces the amount of data written to flash, improving longevity of the media and driving down cost. XtremIO arrays allocate capacity to Volumes on-demand in granular data blocks. Volumes are always thin-provisioned without any loss of performance, over-provisioning of capacity, or fragmentation. Once content-based inline deduplication is implemented, the remaining data is compressed even further, reducing the amount of write operations to the flash media. The data compression is carried out inline on the deduplicated (unique) data blocks.

Benefits gained from avoiding a large percentage of writes include:

- ♦ Better performance due to reduced data
- ♦ Increased overall endurance of the flash array's SSDs
- ♦ Less required physical capacity to store the data, increasing the storage array's efficiency and dramatically reducing the \$/GB cost of storage
- ♦ **Data Protection** – XtremIO leverages a proprietary flash-optimized data protection algorithm (XtremIO Data Protection or XDP), which provides performance that is superior to any existing RAID algorithm. Optimizations in XDP also result in fewer writes to flash media for data protection purposes.
- ♦ **Integrated Copy Data Management (iCDM)** – XtremIO allows consolidation of many different workloads, and the copies of those workloads (for example, test and development), on one array. You can create a larger number of high-performance and space-efficient copies, using XtremIO Virtual Copies (XVC) or using highly-efficient XCOPY with VMware VAAI integration.
- ♦ **Local Data Protection** – XtremIO leverages a proprietary flash-optimized data protection algorithm (XtremIO Data Protection or XDP) which provides protection for data, while enabling performance that is superior to any existing RAID algorithms. Optimizations in XDP also result in fewer writes to flash media for data protection purposes.

- ♦ **Remote Data Protection – Native Replication** – XtremIO leverages its unique content addressable storage, in-memory metadata and copy data management implementation to offer the most efficient replication solution by replicating unique data only. This unique implementation significantly reduces bandwidth and storage array utilization. XtremIO Native Replication enables instantaneous test and failover operations.

XtremIO simplifies the replication management for all use cases. As with all other XtremIO data services, all data protection operations are supported, and their management is simple.

The integration of replication and XtremIO iCDM capabilities simplifies remote repurposing processes and reduces the time for creating and refreshing environments from hours and days to just minutes.

- ♦ **Quality of Service** – This feature enables differential allocation of storage resources and thus provide control over consumption of resources and prevent 'noisy' applications from disrupting performance of other applications.
- ♦ **Protocol Support** – XtremIO supports Fibre Channel (16 Gb) and iSCSI protocols.
- ♦ **Simple Management** – XtremIO leverages its inherent auto-balancing and self-optimizing algorithms to reduce the complexity of storage array management. This results in less management tasks for the Storage Administrator. The consistent performance of XtremIO relieves the Storage Administrator of ongoing battles, decisions and tradeoffs to maintain low latencies. XtremIO offers HTML5 Web-based GUI, CLI interfaces, and RESTful and PowerShell APIs, as well as vCenter Virtual Storage Integrator (VSI), vCenter Realize Orchestrator, and other external ecosystem plugins. A single XtremIO Management Server (XMS) can manage multiple X1 and X2 XtremIO clusters.
- ♦ **Bandwidth Limitation** – XtremIO allows limiting the transferred bandwidth per protection session, defined by MB per second. The protection session is unlimited (default) and an option is provided to specify the maximum bandwidth limitation per protection session. The feature includes Bandwidth Limitation Set and Bandwidth Limitation Reached indicators. XMCLI, Restful API and GUI supported.

Introduction

About this Guide

Verify that you are using the RESTful API Guide for the correct RESTful API version.

This document describes the RESTful API Ver. 3.1. It is recommended to use the latest version in new code initiatives, since it contains the most updated API including all the latest product functionalities.

If you are maintaining an existing code that utilizes RESTful API Ver. 2.x (the previous supported version), you may continue developing it, using the RESTful API Ver. 2.x, only if the new features in Ver. 3.1 are not needed.

For a full list of differences between the XtremIO RESTful API versions, refer to [Appendix A – RESTful API Versions](#) on page 674.

Scope

This guide contains a list of all RESTful API commands that you can use to manage and monitor the XtremIO Storage Array. The guide is intended for authorized users of the XtremIO Storage Array.

This guide also includes detailed descriptions of all supported fields, and describes RESTful API commands, including enhanced features and backward compatibility.

Related Documents

For information about other RESTful API versions, refer to the RESTful API Guide of the required version on Dell EMC Online Support page (<http://support.emc.com>).

For additional information about XtremIO Storage Arrays, refer to the following documents on Dell EMC Online Support page (<http://support.emc.com>):

- XtremIO Storage Array User Guide
- XtremIO Storage Array Security Configuration Guide
- XtremIO Storage Array Host Configuration Guide
- XtremIO Storage Array XIOS Release Notes
- XtremIO Storage Array XMS Release Notes

Introduction

RESTful API Versioning

The RESTful API Version 3.1 is referred to as the current version. Version 2 (2.0/2.1/2.2) is referred to as the previous version. In order to support backward compatibility, XtremIO now supports both Version 2 (2.0/2.1/2.2) and Version 3.0. XtremIO does not support Version 1.0.

Table 1 shows the XMS versions, RESTful API version for each XMS version, and the cluster types supported by each version.

Table 1: XMS and RESTful API Versions with Supported Cluster Types

XMS	RESTful API Versions	Cluster Types Supported
4.0.0	2.0, 1.0	X1
6.0.0	2.1, 1.0	X2
6.0.1	2.2, 1.0	X1, X2
6.1.0	3.0, 2.2	X1, X2
6.2.0	3.1, 2.3	X1, X2

The API version is explicitly declared in the URL path, by using v2 or v3 in the notation syntax (e.g.: "POST /api/json/v2/types/volumes" or "POST /api/json/v3/types/volumes"). If the API version is not explicitly declared in the URL path, then the Version 2 command will execute. However, if the command is new in Version 3 and, therefore, not in Version 2, then the command will not execute.

XtremIO Storage Array XMS Ver. 6.2 can be used with previously-written scripts or programs that employ previously-available versions of the API. However, new commands that are introduced in this software release are supported only by using the latest API Version (3.X). The changed RESTful API supports a different call syntax and different response. The bulk of the RESTful API commands remain unchanged. In many cases, the same call can be made in both Versions 2.X and 3.X.

Using the XtremIO RESTful API

The XtremIO RESTful API is an HTTP-based interface for the automation, orchestration, querying and provisioning of an XtremIO array cluster or multiple clusters. With this API, third party applications can be used to control and fully administer the array. The XtremIO RESTful API supports the development of flexible management solutions for the XtremIO array.

The XtremIO RESTful API includes two types of API commands:

- ♦ Standard API Calls – for operations conforming to general API practices (see [Standard API Calls](#)).
- ♦ XtremIO RESTful API Commands – for complicated operations not conforming to general API practices (see [XtremIO RESTful API Commands](#), on page 13).

Multiple Clusters Managed by a Single XMS

The XtremIO Version 4.0 and above supports the management of multiple clusters via a single XMS. Many of the commands in the XtremIO RESTful API allow specifying the required cluster. For more information about using XtremIO RESTful API commands for multiple cluster configurations, see [Specifying Clusters and Objects In Commands](#), on page 27.

Standard API Calls

Standard API calls use the four HTTP methods (verbs) referred to as "CRUD" operations to create, retrieve, update and delete configurations. Generally, they operate on an object (singleton resource) or group of objects of the same type (resource collection). [Table 2](#) describes these standard methods and their use in the XtremIO RESTful API.

Using the XtremIO RESTful API

Table 2: HTTP Methods (Verbs) and Uses

HTTP Method	Use (Operation)	Similar to
GET	Retrieves and lists the existing configuration of an object or multiple objects.	XtremIO Management Server CLI 'show' commands
POST	Creates a new configuration of an object. The content of that object should be enclosed in the request body.	XtremIO Management Server CLI 'add' commands
PUT	Updates the existing configuration of an object. The content of that change should be enclosed in the request body. Note: In XtremIO RESTful API Commands, PUT is used for all operations (see XtremIO RESTful API Commands , on page 13).	XtremIO Management Server CLI 'modify' commands
DELETE	Deletes the existing configuration of an object.	XtremIO Management Server CLI 'remove' commands

XtremIO RESTful API Commands

XtremIO RESTful API Commands all use the PUT method and perform complicated operations not conforming to standard API practices. RESTful API Commands can operate on objects of different types, as well as perform operations related to XtremIO Storage Array functionality.

For example, creating a protection copy of a Consistency Group is a complicated operation that does not operate only on Consistency Groups. It copies a Consistency Group object and creates a read-only Snapshot-Set object from it. This operation is performed using an XtremIO RESTful API Command (see [Creating a Repurpose Copy of a Consistency Group](#) on page 112).

XtremIO RESTful API Commands are organized by command object type. A command object type is the resource (object type) that a Command primarily acts upon. For example, the Command to add a Volume to a Consistency Group (see [Adding a Volume to Consistency Group](#) on page 117) involves both the Volume and Consistency Group object types. However, the Command's operation primarily acts upon the Consistency Group object type by modifying a Consistency Group object. Therefore, the command object type is Consistency Groups.

All commands primarily operating on the same resource have the same command object type. The command object type is used in the command URL (see [XtremIO RESTful API Command Syntax](#), on page 14). For a list of all Commands by command object type, see [XtremIO RESTful API Commands by Command Object Type](#) on page 15.

Using the XtremIO RESTful API**XtremIO RESTful API Command Syntax**

The following syntax and table describe XtremIO RESTful API Commands:

PUT /api/json/v3/**commands**/**<command-object-type>**/**<command-name>**

URL Component	Description
PUT	The method is PUT for all XtremIO RESTful API Commands.
commands	Indicates this URL is an XtremIO RESTful API Command. This is applicable for all XtremIO RESTful API Commands.
<command-object-type>	Identifies the type of object upon which the XtremIO RESTful API Command primarily operates. (For a list of Commands by command object type, see XtremIO RESTful API Commands by Command Object Type , on page 15).
<command-name>	Identifies the specific XtremIO RESTful API Command. For example, refresh-data.

For example:

PUT /api/json/v3/commands/volumes/refresh-data

XtremIO RESTful API Commands by Command Object Type

The following tables show the XtremIO RESTful API Commands by command object type.

Table 3: Advisory-Notices

Command	Description
acknowledge	Acknowledges an Advisory-Notice
refresh	Refreshes the Advisory-Notices repository.

Table 4: Alerts

Command	Description
acknowledge	Acknowledgings an Alert

Table 5: Consistency Groups

Command	Description
add-copy-volume-to-consistency-groups	Adds a Volume to a linked Consistency Group
add-volume	Adds a Volume to Consistency Group
create-protection-copy	Creates a Protection Copy of a Consistency Group
create-repurpose-copy	Creates a linked Consistency Group
refresh-data	Refreshes a linked Consistency Group, including options to view the Volume relationships for which the refresh operation can execute, and ignoring misaligned Volume positions
remove-volume	Removes a Volume from a Consistency Group
restore-data	Restores data to a Consistency Group from a Snapshot-Set or from a Consistency -Group

Table 6: Local-Protections

Command	Description and Example
resume	Resume a Local Protection Session
start	Start a Local Protection Session
suspend	Suspend a Local Protection Session

Table 7: Remote-Protections

Command	Description and Example

Using the XtremIO RESTful API

Command	Description and Example
failover	Performs a failover operation for a Remote Protection Session
failover-cleanup	Perform a failover cleanup operation for a Remote Protection Session
remove-snapshot-sets	Removes Snapshot-Sets from the source/target in a Remote Protection Session (must be run twice, once for the source and once for the target)
replicate now	Gets the current cycle number of a Remote Protection Session (for bookmarking)
resume	Resumes Remote Protection Session
start	Starts a Remote Protection Session
suspend	Suspends a Remote Protection Session
terminate	Terminates a Remote Protection Session
test-copy-finish	Cleans up after a failover test for a Remote Protection Session
test-copy-start	Starts a failover test for a Remote Protection Session

Table 8: Retention-Policies

Command	Description and Example
copy	Copies a Retention Policy or all Retention Policies from one cluster to another cluster

Table 9: Schedulers

Command	Description and Example
resume	Resume a suspended Scheduler
suspend	Suspend an active Scheduler

Table 10: Snapshot-Groups

Command	Description and Example
calculate-savings	Scans Snapshot-Sets and calculates the savings metrics. View Volume details to see the savings metrics.

Table 11: Snapshot-Sets

Command	Description and Example
create-protection-copy	Creates a protection copy of a Snapshot-Set

Command	Description and Example
create-repurpose-copy	Creates a repurpose copy of a Snapshot-Set

Table 12: Tags

Command	Description and Example
tag-object	Tags an object
untag-object	Untags (remove the tag) of a tagged objects

Table 13: Targets

Command	Description and Example
modify-refresh-replication-password	Modifies a Target refreshing the replication password

Table 14: Volumes

Command	Description and Example
create-protection-copy	Creates a Protection Copy of a Volume
create-repurpose-copy	Creates a Repurpose Copy of a Volume
modify-performance-data-collection	Modifies a Volume or Volumes performance data collection enabled state
refresh-data	Refreshes data from a Volume
restore-data	Restores data to a Volume

Table 15: XMS

Command	Description and Example
add-peer	Adds a peer XMS to a Remote Protection Domains
modify-peer	Modifies a Remote Protection Domain peer XMS
remove-peer	Removes a Remote Protection Domain peer XMS

XtremIO RESTful API Object Identifiers

Each object that XtremIO RESTful API commands use can be identified by an object ID. An object ID uniquely identifies that object. The XtremIO RESTful API uses three types of object IDs:

- ♦ GUIDs
- ♦ names
- ♦ indexes

Object GUID Identifiers

Starting in XtremIO Version 6.1, the XtremIO RESTful API Version 3 supports object GUIDs as object identifiers. Object GUIDs are globally unique identifiers for objects (GUIDs are 128 bit values). Object GUIDs are unique over time ("perpetually unique"). An object's GUID does not change over the lifetime of the object.

For multiple cluster configurations, Object GUID identifiers are unique in-cluster and between clusters (for more information about specifying objects in a multiple cluster configuration, see [Specifying Clusters and Objects In Commands](#) on page 27). Object GUIDs are the recommended object ID for XtremIO RESTful API commands.

Note: It is highly recommended to use object GUID identifiers instead of object names or object indexes, because they are unique in-cluster and between clusters. However, some commands require Cluster Ids. In most commands, object GUID identifiers also eliminate the requirement to specify a cluster index or name ([Object GUID Identifiers](#)).

Object GUID identifiers are specified in the command header, some command bodies, and are returned in command response HREFs.

Object Name Identifiers

Object names are strings used as identifiers for objects. Object names can change during an object's lifetime. Empty strings for object names are permitted. Objects with empty string names are called, unnamed objects. Object names that are not empty (not unnamed objects) must be unique within their object class at the same time. Two objects of the same class cannot concurrently have the same name. When an object is deleted, however, its object name can be reused. XtremIO RESTful API commands can be used to name objects upon creation and rename existing object names. Object names are often a convenient property for users working with objects, especially CLI and script users.

The requirements for a non-empty object name are the following:

- ♦ Character Lengths:
 - ♦ Volumes – up to 256 characters
 - ♦ All other objects – up to 64 characters
- ♦ Valid characters:
 - ♦ Alphanumeric characters
 - ♦ Space character
 - ♦ ~ ! @ # \$ % ^ * _ + { } | : ? . -
- ♦ Invalid characters:
 - ♦ & / < >

Note: For most standard API calls and XtremIO RESTful API Commands in the XtremIO RESTful API Version 3, object GUID identifiers eliminate the requirement to use an object name.

Using the XtremIO RESTful API

Object Index Identifiers

Object indexes are small positive integers used as object identifiers. Object indexes are unique across all concurrently existing objects of the same class. XMS assigns an object its index upon object creation. Object indexes cannot change during an objects lifetime. Object indexes are a convenient means to easily identify objects, including unnamed objects.

Note: For most standard API calls and XtremIO RESTful API Commands in the XtremIO RESTful API Version 3, object GUID identifiers eliminate the requirement to use an object index.

Cluster Object Identifiers

Cluster objects also use object GUID identifiers (as well as object indexes and object names). In multiple cluster configurations, for most XtremIO RESTful API commands, specifying the cluster object is only required if the resource object (the object in the URI) is specified using its object index or object name, because more than one object of the same type could have the same index or name in different clusters. If the resource object is specified using its object GUID, then the cluster object need not be specified, because object GUID identifiers are unique in-cluster and between clusters. In short, by using object GUID identifiers the cluster is known.

Note: It is highly recommended to use object GUID identifiers instead of cluster indexes or cluster names, and object indexes or object name. However, if the cluster-id is specified, the cluster-id name property (cluster-id="cluster name") is recommended, as a cluster's index number property may change when a cluster is removed and added from one XMS to another.

Some API calls and XtremIO API Commands do require specifying the cluster object. Those command sections indicate the requirement, accordingly.

API calls to list cluster objects (GET commands) in multiple cluster configurations, require a cluster index or cluster name to view a single cluster's objects. To view all clusters objects, then do not specify a cluster index or name. For single cluster configurations, specifying the cluster index number or cluster name remains optional (for cluster-related commands).

Note: 'cluster-id' is shown as the 'sys-id' output parameter in RESTful API responses. The 'sys-id' output parameter is a tuple array containing the cluster's object GUID identifier, object name, and object index.

XtremIO RESTful API Parameter Types

The XtremIO RESTful API uses the following three types of parameters for creating (POST method), reading (GET method), updating (PUT method), and deleting (DELETE method) objects. The three types of parameters are the following:

- ♦ path parameters (see [Path Parameters](#), below)
- ♦ query string parameters (see [Query String Parameters](#) on page 23)
- ♦ request body parameters (see [Path and Query String Parameter Syntax in Commands](#) on page 24)

Path Parameters

Path parameters are used to identify resource objects and object properties. Path parameters are part of the URI and are appended to the URI by adding a slash ("/"), followed by the path parameter value. Only the value is used, not the parameter name. Path parameters may be optional, depending upon the specific API command and its usage.

The general syntax for path parameters is as follows:

`/api/json/v3/types/[object-type]/<path-parameter-value>`

Use one of the following to specify a path parameter in the header of a RESTful API command:

- ♦ object GUID
Example: `/api/json/v3/types/volumes/c72fd4f74cc64ee798e218af60ce1ec`
- ♦ object Index
Example: `/api/json/v3/types/volumes/1`

Query String Parameters

Query string parameters are input parameters used as part of the URI and are appended to the URI by adding a question mark ("?"), followed by a parameter name, an equal sign ("="), and then the parameter value. Additional parameters are added to the query string by appending an ampersand ("&") after a parameter value, and then another parameter name, equal sign, and parameter values.

The general syntax for query parameters is as follows:

```
/api/json/v3/types/[object-type]?<parameter1-name>=<value1>&<parameter2-name>=<value2>
```

Use one of the following to specify a query parameter in the header of a RESTful API command:

- ♦ object GUID

Example: `/api/json/v3/types/r-snapshot-sets?protection-session-id=c2ade4c4b38748978c392191e60b5288`

- ♦ object index

Example: `/api/json/v3/types/Volumes?cluster-id=1`

- ♦ object name

Example: `/api/json/v3/types/Volumes?cluster-name=xbrickdrm165`

Note: Use one question mark ("?",) after the object type, without a preceding slash ("/"), and an ampersand ("&") separating each parameter name / value pair.

Using the XtremIO RESTful API

Path and Query String Parameter Syntax in Commands

In each command section, the command syntax represents path and query string parameter values using names. These names combine the type of object and the type of parameter. To execute a command, do not use the name. Substitute the value for the name.

For example, in the command syntax to view the details of a Volume, the object GUID identifier is named "vol-guid", the object index is named "vol-id", and the object name is "vol-name". The command syntax for that example is the following:

GET /api/json/v3/types/volumes/<parameter [**vol-guid** or **vol-index** or **?name= vol-name**]>)

The usage is:

GET /api/json/v3/types/volumes/ **c72fd4f74cc64ee798e218af60ce1ec**

GET /api/json/v3/types/volumes/**1**

GET /api/json/v3/types/volumes?**name=Vol123**

For more information about this command and its syntax, see [Viewing the Details of a Volume](#) on page 606.

Request Body Parameters

Request body parameters are input parameters used in the request body, not in the URI. Request bodies usually contain one or more parameters. However, some XtremIO commands require an empty request body. Request bodies contain parameter name and value pairs for each object property the API command uses.

The XtremIO's RESTful API uses JSON (JavaScript Object Notation) for request bodies. JSON is a lightweight data-interchange format.

The general form of a request body JSON is as follows:

```
{"parameter1": "value1", "parameter2": "value2", "name_or_integer": 123}
```

Note: The entire request body is enclosed in braces ("{" , "}"). All values except names and integers must be enclosed in double quotes. However, names and integers can also be enclosed in double quotes. Parameter names and values are separated by a colon (":"). Parameter name / value pairs are separated by a comma (",").

Request body parameters values can be integers, floating point numbers, strings, Booleans (as strings), object indexes, object names, object GUIDs, or lists which are groups of values applying to a single parameter. Lists can also contain mixed value types, for example a list containing a string value, an integer value, and a GUID.

Using the XtremIO RESTful API

Use one of the following to specify a request body parameter of a RESTful API command:

- ♦ object GUID

Example: {"vol-id":["0b4efb8333f944b7800b5b34d6b5df1f"]}

Note: The object GUID identifier is enclosed in double quotes within square brackets

- ♦ object GUID List

Example: {"vol-list":

[[["0b4efb8333f944b7800b5b34d6b5df1f"],["61ef99db693a4d70b9ce639022662cb0"],["3451a212605e4305aea6f75eef3f0d30"]]]}

Note: Each object GUID identifier is enclosed in double quotes within square brackets, and the entire list is enclosed in another set of square brackets.

- ♦ object Index

Example: {"vol-id":1}

- ♦ object name

Example: {"vol-name":"MYVOL-100"}

- ♦ list of different parameter types

Example: {"vol-list" : [[["825ea2e0a1694e02b7d7df4f413a316b"],["548294e77d2b4cb494d4c5ded1c1a9a2"],12,"ProdVolume100"]]}

Specifying Clusters and Objects In Commands

To specify a cluster and object in the header of a RESTful API command:

Note: The following examples demonstrate that either (a) an object GUID identifier is used as a path parameter or (b) the combination of cluster name or cluster index, and object name or index is required.

- ♦ object GUID

Example: `/api/json/v3/types/[object type]/e4c9635a6fb0470bbbbe3f0af527a288`

Note: Using the object GUID eliminates the requirement for a cluster index or cluster name.

- ♦ cluster-index and object index

Example: `/api/json/v3/types/[object type]/1?cluster-index=2`

- ♦ cluster-index and object name

Example: `/api/json/v3/types/[object type]?name=ABC&cluster-index=2`

- ♦ cluster-name and object index

Example: `/api/json/v3/types/[object type]/1?cluster-name=xbrickdrm220`

- ♦ cluster-name and object name

Example: `/api/json/v3/types/[object type]?name=ABC&cluster-name=xbrickdrm220`

Using the XtremIO RESTful API

To specify a cluster in the body of a RESTful API command, use the `cluster-id` parameter and either the cluster index or cluster name for its value, as shown in the examples below:

- ♦ Cluster ID using cluster index

Example: {"vol-name":"Vol123","vol-size":"1g","**cluster-id**

- ♦ Cluster ID using cluster name

Example: {"vol-name":"Vol123","vol-size":"1g","**cluster-id**":"xbrickdrm220"}

Note: cluster-index and cluster-name are not required for XMS objects (e.g. Tags and User Accounts).

Object Identifier Requirements Summary

For XtremIO RESTful API, GET/POST/PUT/DELETE commands:

- ♦ Object GUID is required for most cluster objects
- ♦ Cluster name or cluster index number is optional for most cluster objects

Note: Commands requiring cluster-id/name are documented accordingly.

- ♦ No cluster name or cluster index number is required for XMS objects

Note: No cluster-id/name is required when the XMS is managing a single cluster.

Generating Output and Filtering

XtremIO RESTful API enables displaying a list view of either all parameters in list response sets, or a partial list of parameters in list response sets (the response will always display the "href" and "name" parameters). This is an alternative option to the default view, which displays only the list of returned object URLs.

Note: The commands and outputs in this section only apply to the GET command and assume working a single cluster.

Output List Definition

This section contains default GET command outputs.

- ♦ `/api/json/v3/types/volumes/`

GETs a list of all the objects (Volumes), with the name of the object, the objects' URLs/Href and cluster name owning the object.

Note: The cluster name in the output is referred to as sys-name.

- ♦ `/api/json/v3/types/volumes/3cd726fa7eaa4e9b97ad724c40e24837`

GETs all the output parameters and their values of the selected object. In our example all the output parameters and values of the Volume with an object GUID of "3cd726fa7eaa4e9b97ad724c40e24837" are listed.

- ♦ `/api/json/v3/types/volumes?name=vol-name`

Alternatively, use the object index instead of the name.

Note: An object index may be reused if an object is deleted. In this case, the object index may no longer identify the same object.

The user is able to change the default output of the GET commands by using additional syntax, as in the following syntax:

- ♦ `/api/json/v3/types/volumes/28?cluster-index=1&prop=index&prop=naa-name`

Using the `&prop` option enables you to list selected output parameters and their values of the defined object. Multiple parameter lists are supported. In our example, the system displays the output parameters `index` and `naa-name` for the Volume with the index number 28.

- ♦ `/api/json/v3/types/volumes?full=1`

Using the `full=1` option, all parameters of the entire list of objects are returned.

- ♦ `/api/json/v3/types/volumes?full=1&prop=index&prop=naa-name`

In this example the `index` and `naa-name` output parameters and their values will be displayed for all Volumes in a list view.

Using the XtremIO RESTful API

Filtering Logics

XtremIO RESTful API supports the definition of filtering logics. This support enables you to retrieve concise and specific responses that potentially contain large amounts of unwanted rows. Any object property that can be exposed via RESTful API can be used as a filtering parameter.

The following filtering logics can be applied to filter out objects from a list.

Filter Type	Syntax
Equal to (Numeric/Integer or String properties)	eq
Not equal to (Numeric/Integer or String properties)	ne
Date and time properties	to-date-time from-date-time (Event monitoring only)
Greater than	gt
Greater than or equal to	ge
Less than	lt
Less than or equal to	le
Like	like Returns the defined term contained within the property.

When multiple properties are used for filtering, logical AND logical OR can be used between all of the specified properties.

Logical AND Example

Logical AND is determined by the use of &filter= in the path. Use logical AND when filtering between different parameters.

/api/json/v3/types/volumes?filter=vol-size:eq:10240&filter=name:eq:production

This only returns a property of the size 10240KB and with the name of "production".

Note: A filter can be used for any property that is relevant to the object.

Logical OR Example

Logical OR is determined by the use of "," in the path. Use logical OR when filtering between different values of a selected parameter.

```
/api/json/v3/types/volumes?filter=vol-size:eq:1G,vol-size:eq:10G,vol-size:eq:100G
```

This will return all Volumes of the size 1G or 10G or 100G.

Note: Logical OR can only be used for the same property.

Filtering syntax:

Filter=property1: OPERATOR: value & filter = property2: OPERATOR: value

Examples:

- To display all Volumes of a specified size (in this example it is 10240KB):
/api/json/v3/types/volumes?filter=vol-size:eq:10240
- To view all Volumes not of the specified size (in this example it is 262144000KB):
/api/json/v3/types/volumes?filter=vol-size:ne:262144000
- To view all LUN mapping with LUN greater than 200:
/api/json/v3/types/lun-maps/?filter=lun:gt:200
- To view all LUN mapping with LUN less than or equal to 10:
/api/json/v3/types/lun-maps/?filter=lun:le:10
- To view all Volumes that contain the word "production":
/api/json/v3/types/volumes/?filter=name:like:production

This filter would return the following Volumes: current_production, previous_production, production_backup

Note: No cluster-id/name is required for managing a single cluster.

Note: When making direct protocol calls, you must specifically encode all reserved characters. The examples in the guide use a client library that automatically encodes the reserved characters of the URL.

Accessing the RESTful API

Access to the RESTful API is achieved via HTTPS.

Using the XtremIO RESTful API

XtremIO Management Server (XMS) uses a self-signed certificate. To gain access to the RESTful API securely and receive certificate verification, you are first required to install the root certificate.

All commands and responses listed in this guide were run via Google Chrome[®] Postman[®] * extension tool and the Linux `curl` command.

For more information on this extension tool, refer to:

<https://www.getpostman.com>

curl Commands and the XtremIO RESTful API

This section contains common use guidelines for using `curl` and the XtremIO RESTful API. This section is not intended as a complete guide to `curl` and does not contain a complete list of examples.

Note: Refer to the documentation for the `curl` implementation you use for more information.

"`curl`" is a command line tool used for transferring data to and from servers using URLs. Several implementations of `curl` are available. Some `curl` usage may vary by implementation.

* Google Chrome and Postman are trademarks or registered trademarks of Google.

The following are an example of curl command syntax and descriptions of usage in the XtremIO RESTful API.

```
curl -k -X <HTTP method> -d '{"param1": "value1", "param2": "value2"}' '<URL>'
```

- ♦ **curl** – curl commands begin with "curl".
- ♦ **-k** – This option indicates a non-secure SSL connection is allowed.

Note: All examples in this document use the "-k" option.

- ♦ **-X <HTTP method>** – This option indicates an HTTP method follows the "-X" option, for example:
 - X POST
 - X PUT
 - X DELETE

Note: "-X GET" is not required, because the GET method is the default.

- ♦ **-d** – This option indicates data follows the "-d" option and for XtremIO RESTful API commands the data is an input body, for example:


```
-d '{"vol-name": "test1", "vol-size": "16"}'
```
- ♦ **<URL>** – The full URL including the protocol, username, password, name of the XMS, and the XtremIO RESTful API command, for example:


```
https://user:password@XMSName/api/json/v3/types'
```

Additionally, the following are important syntax guidelines you may require for XtremIO RESTful API commands using curl:

- ♦ Single quotes (') and double quotes (")
 - ♦ If an input body is not required, then use either single or double quotes to enclose the entire URL, including the query string parameters.

Note: In some cases, quotes enclosing the URL are not required. For example, if the XtremIO RESTful API command does not require query string parameters.

- ♦ If an input body is required, use single quotes to enclose the entire URL, single quotes to enclose the entire input body, and double quotes to enclose each parameter name and parameter value.

Using the XtremIO RESTful API

For example:

```
curl -k -X POST -d '{"vol-name": "test1", "vol-size": "1G"}'
'https://user:password@XMSName/api/json/v3/types/volumes/'
```

Note: Some parameters values may not require double quotes, for example integers.

Note: Unintentionally mismatching quotes may require careful inspection of the curl command to identify the misplaced single or double quotes.

- ♦ Encoding – Some characters require encoding for curl to properly transfer the character to the server. Encoding is the substitution of a special character or string for a character that does not properly transfer. The following are examples of commonly used encoding:

- ♦ **%20** – encodes a space
- ♦ **+** – encodes a space
- ♦ **%21** – encodes an exclamation point (!)
- ♦ **%3A** – encodes a colon (:))

For example, the value 2018-09-03 15:26:16 for the to-date parameter requires encoding:

```
to-date-time=2018-09-03%2015%3A26%3A16
```

- ♦ Escaping – Some characters may require a preceding backslash (\) for curl to properly interpret the character.

For example, the list [avg__wr_iops] for the prop-list parameter requires escaping the square brackets using a backslash:

```
prop-list=\[avg__wr_iops\]
```

User Roles

The XtremIO Storage Array User Accounts are defined for each user’s authorized capabilities and roles, which are built into the cluster with predefined authorization capabilities, and cannot be removed, renamed or modified. Each user is issued a User Id (i.e. the User Account name) and password.

Three levels of users’ roles are supported, as shown in the following table:

Role	RESTful API Capability
Admin	All commands
Configuration	All storage array configuration commands. Cannot manage users or set notification configurations.
Read-Only	HTTP GET commands only

Basic Cluster Management Flow

Basic cluster management involves assigning Initiators with access to the cluster's Volumes by LUN mapping.

To create a LUN mapping:

1. Add Volumes to the cluster (see [Adding a New Volume](#) on page 616).
2. Create an Initiator Group (see [Adding an Initiator Group](#) on page 248).
3. Add Initiators to the Initiator Group (see [Adding an Initiator](#) on page 228).
4. Assign Volumes to the Initiators (see [Creating a LUN Mapping](#) on page 308).

RESTful Response Codes

Each command retrieves a specific HTTP response code.

Potential response codes include:

Response Code	Description
200 OK	The request is valid and points to an existing object.
201 CREATED	A valid request to add an object is confirmed.
400 BAD REQUEST	The request points to a non-existing object, a syntax problem, or a failed validation.
401 UNAUTHENTICATED USER	Indication that either the username or password is incorrect.

Supported Objects

Supported Objects

Viewing the Supported Objects

GET /api/json/v3/types

This command (GET /api/json/v3/types) displays the list of all supported objects.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example Request

GET /api/json/v3/types HTTP/1.1 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "children": [
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/advisory-
notices",
      "name": "advisory-notices"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/alert-
definitions",
      "name": "alert-definitions"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/alerts",
      "name": "alerts"
    }
  ],
}
```

```

    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/bbus",
      "name": "bbus"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/bricks",
      "name": "bricks"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/clusters",
      "name": "clusters"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/consistency-
group-copies",
      "name": "consistency-group-copies"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/consistency-
groups",
      "name": "consistency-groups"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/dae-
controllers",
      "name": "dae-controllers"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/dae-psus",
      "name": "dae-psus"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/dae-row-
controllers",
      "name": "dae-row-controllers"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/daes",
      "name": "daes"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/data-
protection-groups",
      "name": "data-protection-groups"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/debug-info",
      "name": "debug-info"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/discover-
initiators",
      "name": "discover-initiators"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/email-
notifier",
      "name": "email-notifier"
    },
  ],

```

Supported Objects

```

    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/events",
      "name": "events"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/infiniband-
switches",
      "name": "infiniband-switches"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/initiator-
groups",
      "name": "initiator-groups"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/initiators",
      "name": "initiators"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/initiators-
connectivity",
      "name": "initiators-connectivity"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/ip-links",
      "name": "ip-links"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/iscsi-
portals",
      "name": "iscsi-portals"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/iscsi-routes",
      "name": "iscsi-routes"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/ldap-configs",
      "name": "ldap-configs"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/local-disks",
      "name": "local-disks"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/local-
protections",
      "name": "local-protections"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/lun-maps",
      "name": "lun-maps"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/nvrams",
      "name": "nvrams"
    },
  ],

```


Supported Objects

```

    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/performance",
      "name": "performance"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/protection-
domains",
      "name": "protection-domains"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/qos-policies",
      "name": "qos-policies"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/r-consistency-
groups",
      "name": "r-consistency-groups"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/r-snapshot-
sets",
      "name": "r-snapshot-sets"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/r-target-
ports",
      "name": "r-target-ports"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/r-volumes",
      "name": "r-volumes"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/remote-
protections",
      "name": "remote-protections"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/retention-
policies",
      "name": "retention-policies"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/schedulers",
      "name": "schedulers"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/slots",
      "name": "slots"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/snapshot-
groups",
      "name": "snapshot-groups"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/snapshot-
sets",
      "name": "snapshot-sets"
    }
  ]
}

```

Supported Objects

```

    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/snmp-
notifier",
      "name": "snmp-notifier"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/ssds",
      "name": "ssds"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/storage-
controller-psus",
      "name": "storage-controller-psus"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/storage-
controllers",
      "name": "storage-controllers"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/syr-notifier",
      "name": "syr-notifier"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/syslog-
notifier",
      "name": "syslog-notifier"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/tags",
      "name": "tags"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/target-
groups",
      "name": "target-groups"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/targets",
      "name": "targets"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/user-
accounts",
      "name": "user-accounts"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/volume-
copies",
      "name": "volume-copies"
    },
    {
      "href": "https://vxms-xbrickdrm1208/api/json/v3/types/volume-pairs",
      "name": "volume-pairs"
    },
    {

```

Supported Objects

```
        "href": "https://vxms-xbrickdrm1208/api/json/v3/types/volumes",
        "name": "volumes"
      },
      {
        "href": "https://vxms-xbrickdrm1208/api/json/v3/types/volumes-
savings",
        "name": "volumes-savings"
      },
      {
        "href": "https://vxms-xbrickdrm1208/api/json/v3/types/xenvs",
        "name": "xenvs"
      },
      {
        "href": "https://vxms-xbrickdrm1208/api/json/v3/types/xms",
        "name": "xms"
      }
    ],
    "links": [
      {
        "href": "https://vxms-xbrickdrm1208/api/json/v3/types/",
        "rel": "self"
      }
    ]
  }
}
```

Advisory Notices

Viewing the List of Advisory Notices

GET /api/json/v3/types/advisory-notices

This command (GET /api/json/v3/types/advisory-notices) integrates with the ESRS service. ESRS allows Dell EMC to publish advisory notices such as new software available or a new documentation. The command displays the list of all advisory notices received by the XMS.

Note: Only Dell EMC can publish new advisory notices.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration OR - a multiple cluster configuration, to specify all clusters - Yes – for a multiple cluster configuration, to specify a specific cluster

Example Request

```
GET /api/json/v3/types/advisory-notices HTTP/1.1
Host: vxms-xbrickdrm1271.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Advisory Notices

Response

```
{
  "advisory-notices": [
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/0f64cb90e3e9430890387951c91da076",
      "name":
"LatestClusterSWVersion_ClusterDISetForQA_XIOS_6_2_0_96_HF1_XMS_6_2_0_96",
      "sys-name": "xbrickdrm1271"
    },
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/c43a3833a1de416c95b535feb8554f96",
      "name":
"LatestClusterSWVersion_ClusterDISetForQA_XIOS_6_3_0_66_XMS_6_2_0_96",
      "sys-name": "xbrickdrm1271"
    },
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/21c05fcc7bc647de9ddfa8d930819f29",
      "name": "LatestDocument_BETARN",
      "sys-name": "xbrickdrm1271"
    },
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/f3b4d9ef56e04d28bf89259156d55db4",
      "name": "LatestDocument_DocumentSet_ETA",
      "sys-name": "xbrickdrm1271"
    },
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/44b2b8938823484d950181c9f6196274",
      "name": "LatestDocument_DocumentSet__XIOS_6_2_0_XMS_6_2_0",
      "sys-name": "xbrickdrm1271"
    },
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/ece77da781554233bb50ce03c5b25ce8",
      "name": "LatestNotification_BETAEXT4ETA",
      "sys-name": "xbrickdrm1271"
    },
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/43808c8eea75434dbe920eaafb6a53cb",
      "name": "LatestNotification_EXT4_ETA",
      "sys-name": "xbrickdrm1271"
    },
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/f3f3ce11ff78453bae1f386b0ced5e5c",
      "name": "LatestNotification_NotificationDocSet_1_5_3",
      "sys-name": "xbrickdrm1271"
    },
    {
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
```

```

notices/a4c3020b007d43f7977991b309430bfb",
  "name": "LatestNotification_NotificationDocSet__XIOS_6_2_0",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/21241d8de53b4ac592e820a5cf7c4b2b",
  "name":
"LatestNotification_NotificationDocSet__XIOS_6_2_0_XMS_6_2_0",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/5ada135251a4fe487df5b809d5cee10",
  "name": "LatestNotification_NotificationDocSet__XMS_6_2_0",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/95e7116b61b446778dd914483d53eadb",
  "name":
"LatestClusterSWVersion_ClusterDISetForQA__XIOS_6_2_0_96_HF1_XMS_6_2_0_96",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/3364c59ea10048c7949a6f39870ed06d",
  "name":
"LatestClusterSWVersion_ClusterDISetForQA__XIOS_6_3_0_66_XMS_6_2_0_96",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/e3acab4f85ce46cb82278ec3461b2ccf",
  "name": "LatestDocument_BETARN",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/c2d78e455f2d4ea8980f1013ed776ed7",
  "name": "LatestDocument_DocumentSet_ETA",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/540c23a98bc342f7b3f65b213c4d3096",
  "name": "LatestDocument_DocumentSet__XIOS_6_2_0_XMS_6_2_0",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/9f99f4fbfd64cafb71779199d79466",
  "name": "LatestNotification_BETAEXT4ETA",
  "sys-name": "xbrickdrm1271"
},
{
  "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/465bcd9e6a124300b05a009b22e818c2",
  "name": "LatestNotification_EXT4_ETA",

```

Advisory Notices

```

        "sys-name": "xbrickdrm1271"
      },
      {
        "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/c19278fc1d3a49fb81e3c390badd0a2c",
        "name": "LatestNotification_NotificationDocSet_1_5_3",
        "sys-name": "xbrickdrm1271"
      },
      {
        "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/b46feebc4bae4945af532c3a03ec5175",
        "name": "LatestNotification_NotificationDocSet__XIOS_6_2_0",
        "sys-name": "xbrickdrm1271"
      },
      {
        "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/05b6bd67300e4de299c188d458ae13a8",
        "name":
"LatestNotification_NotificationDocSet__XIOS_6_2_0_XMS_6_2_0",
        "sys-name": "xbrickdrm1271"
      },
      {
        "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/95b89e0345b54171a003f6f2bcc64dbf",
        "name": "LatestNotification_NotificationDocSet__XMS_6_2_0",
        "sys-name": "xbrickdrm1271"
      },
      {
        "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/ba6cb22303f24a2a89ec7c400e965014",
        "name":
"LatestXMSVersion_XMSDISetForQA__XIOS_6_2_0_96_XMS_6_2_0_96_HF1",
        "sys-name": "xbrickdrm1271"
      },
      {
        "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/db9e99c82ba44105b6ddaf39a5d1ee6b",
        "name":
"LatestXMSVersion_XMSDISetForQA__XIOS_6_3_0_66_XMS_6_3_0_66",
        "sys-name": "xbrickdrm1271"
      }
    ],
    "links": [
      {
        "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/",
        "rel": "self"
      }
    ]
  }

```


Viewing the Details of an Advisory Notice

GET /api/json/v3/types/advisory-notices/<parameter (advisory-notice-guid or advisory-notice-index or ?name= advisory-notice-name)>

This command (GET /api/json/v3/types/advisory-notices/<parameter [advisory-notice-guid or advisory-notice-index or ?name= advisory-notice-name]>) integrates with the ESRS service. ESRS allows Dell EMC to publish advisory notices such as new software available or a new documentation. The command displays the list of all advisory notices for a cluster.

Note: Only Dell EMC can publish new advisory notices.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
advisory-notice-guid	A unique identifier for the Advisory Notice.	Select one of the following: - advisory-notice-guid - advisory-notice-index - advisory-notice-name
advisory-notice-index	The index of the Advisory Notice.	
advisory-notice-name	The name of the Advisory Notice.	
- cluster-index OR - cluster-name	The Cluster index or name of the Advisory Notice.	- No – for single cluster configurations or if advisory-notice-guid is specified - Yes – for multiple cluster configurations and if the advisory-notice-guid is not specified

Output Parameter	Description

Advisory Notices

Output Parameter	Description
advisory-notice-category	The category describing the Advisory Notice. The category serves to differentiate required processing and ease filtering. Values: - cluster_sw - Cluster Software - xms_sw - XMS Software - document - Document - script - Script - tool - Tool - message - Message
advisory-notice-id	For this Advisory Notice, a tuple array containing the following parameters (in the following order): the Advisory Notice object GUID identifier, the Advisory Notice name, and the Advisory Notice index.
advisory-notice-name	The name of the Advisory Notice object.
advisory-notice-state	Indicates the Advisory Notice's state. Values: - Outstanding – The Advisory Notice has not yet been acknowledged by the user. - Acknowledged - The Advisory Notice has yet been acknowledged by the user. - Outdated - The Advisory Notice has not been acknowledged by the user. And is outdated. When the user acknowledges the Advisory Notice, it will be deleted by XMS.
advisory-text	The Advisory Notice text to show to the target audience.
associated-cluster-id	The cluster Id for which this Advisory Notice is targeted.
associated-cluster-psnt	The Product Serial Number Tag (PSNT) part number of the associated cluster.
creation-time	The time this Advisory Notice was created by XMS (in UTC).
download-completion-state	States whether the tool/script relevant for this specific advisory-notice has been successfully download. This is relevant for script and tool Advisory Notice categories, only.
guid	A unique identifier for the Advisory Notice.
index	The index number, defined by the XMS (a unique identifier for this Advisory Notice instance).
name	The name of the Advisory Notice object.

Output Parameter	Description
role-visibility	This describes the target audience for this Advisory Notice. The Advisory Notices is visible only to this audience. Support notices are only visible to support. User notices are visible to support and users. Values: • user • support
xms-id	For the XMS to which this Advisory Notice belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/advisory-notices/e4c9635a6fb0470bbbbe3f0af527a288
HTTP/1.1
Host: vxms-xbrickdrm1271.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Advisory Notices

Response

```
{
  "content": {
    "index": 37,
    "creation-time": "2018-02-14 12:50:50.556603",
    "guid": "e4c9635a6fb0470bbbbe3f0af527a288",
    "xms-id": [
      "4ac4c14220c24c6195b3239e39aa8c91",
      "xms",
      1
    ],
    "name": "LatestXMSSWVersion_XMSDISetForQA_XIOS_6_2_0_63_XMS_6_2_0_63",
    "advisory-notice-id": [
      "e4c9635a6fb0470bbbbe3f0af527a288",
      "LatestXMSSWVersion_XMSDISetForQA_XIOS_6_2_0_63_XMS_6_2_0_63",
      37
    ],
    "role-visibility": "user",
    "download-completion-state": null,
    "advisory-notice-name":
    "LatestXMSSWVersion_XMSDISetForQA_XIOS_6_2_0_63_XMS_6_2_0_63",
    "associated-cluster-psnt": "SYR00010910001",
    "advisory-notice-category": "xms_sw",
    "associated-cluster-id": "xbrickdrm1271",
    "advisory-text": "LatestXMSSWVersion_XMSDISetForQA2018-02-
08_17:50:07.403989",
    "advisory-notice-state": "outstanding"
  },
  "links": [
    {
      "guid": "e4c9635a6fb0470bbbbe3f0af527a288",
      "href": "https://vxms-xbrickdrm1271/api/json/v3/types/advisory-
notices/e4c9635a6fb0470bbbbe3f0af527a288",
      "rel": "self"
    }
  ]
}
```

Acknowledging an Advisory Notice

PUT /api/json/v3/commands/advisory-notices/acknowledge/<parameter (advisory-notice-guid)>

This command (PUT /api/json/v3/commands/advisory-notices/acknowledge/<parameter [advisory-notice-guid]>) enables you to acknowledge an Advisory Notice.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
advisory-notice-guid	A unique identifier for the Advisor Notice.	Yes

Example Request

```
PUT /api/json/v3/commands/advisory-notices/acknowledge/
e4c9635a6fb0470bbbbe3f0af527a288 HTTP/1.1
Host: vxms-xbrickdrm1271.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Advisory Notices

Refreshing the Advisory Notice Repository

PUT /api/json/v3/commands/advisory-notices/refresh

This command (PUT /api/json/v3/commands/advisory-notices/refresh) enables you to refresh the Advisory Notice repository.

Note: No object identifier is required, because the entire Advisory Notice repository is refreshed.

Example Request

```
PUT /api/json/v3/commands/advisory-notices/refresh HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Alerts

Viewing the List of Alerts

GET /api/json/v3/types/alerts

This command (GET /api/json/v3/types/alerts) displays the list of Alerts.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration OR - a multiple cluster configuration, to specify all clusters - Yes – for a multiple cluster configuration, to specify a specific cluster

Example Request

```
GET /api/json/v3/types/alerts HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Alerts

Response

```
{
  "alerts": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/alerts/07ff05ddd3654536a1fc25a0a805918f",
      "name": ""
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/alerts/770534497ed045be93393aaa5645ac62",
      "name": ""
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/alerts/cd6336b5e972417396cb185276708c00",
      "name": ""
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/alerts/779957b889e5499d8844c78eb76fda71",
      "name": ""
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/alerts/f171f554430746798496eb947da10147",
      "name": ""
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/alerts/",
      "rel": "self"
    }
  ]
}
```


Viewing the Details of an Alert

GET /api/json/v3/types/alerts/<parameter (alert-guid or alert-index or ?name=alert-name)>

This command (GET /api/json/v3/types/alerts/<parameter [alert-guid or alert-index or ?name=alert-name]>) displays the details of the selected Alert.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
alert-guid	A unique identifier for the Alert.	Select one of the following: • alert-guid • alert-index • alert-name
alert-index	The index of the Alert.	
alert-name	The name of the Alert.	
• cluster-index OR • cluster-name	The Cluster index or name of the Advisory Notice.	• No – for single cluster configurations or if alert-guid is specified • Yes – for multiple cluster configurations and if the alert-guid is not specified

Output Parameter	Description
guid	A unique identifier for the Alert.
alert-code	Alert code (the numeric code used to identify all Alerts of this type)
alert-state	The state of the Alert
alert-type	The Alert name in words
assoc-obj-id	For the object with which this Alert is associated, a tuple array containing the following parameters (in the following order): the object GUID identifier, the object name, and the object index.
assoc-obj-index	The Id of the object associated with the Alert
assoc-obj-name	Name of the object associated to the Alert
class-name	The class of the entity reporting the Alert
description	Description of the problem that is causing an Alert

Alerts

Output Parameter	Description
index	The index number, defined by the XMS (a unique identifier for this Alert instance)
name	Alert's name as it appears in the Alert Definition
raise-time	The last time the Alert was raised
severity	The severity of the Alert, determined by the Alert Definition severity value.
sys-id	For the cluster to which this Alert belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. May be omitted if only one cluster is defined.
threshold	The threshold for this Alert
xms-id	For the XMS to which this Alert belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/alerts/f171f554430746798496eb947da10147 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "assoc-obj-name": "20:01:00:0e:1e:c2:c9:3c",
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "description": "Initiator has non-redundant path connectivity (Connected to a single Storage Controller).",
    "class-name": "Initiator",
    "sys-index": 1,
    "sys-name": "xbrickdrm919",
    "threshold": "",
    "alert-code": "2400203",
    "guid": "f171f554430746798496eb947da10147",
    "sys-id": [
      "7e0bbd4b7d69477ab32e2953636a70de",
      "xbrickdrm919",
      1
    ],
    "name": "",
    "index": 37,
    "severity": "major",
    "alert-type": "alert_def_initiator_redundancy_state_non_redundant",
    "alert-state": "clear_unacknowledged",
    "raise-time": "1517310529142",
    "assoc-obj-index": 3,
    "assoc-obj-id": [
      "e30e5c81197343b2945e51bf5e9987ef",
      "20:01:00:0e:1e:c2:c9:3c",
      3
    ]
  },
  "links": [
    {
      "guid": "f171f554430746798496eb947da10147",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/alerts/f171f554430746798496eb947da10147",
      "rel": "self"
    }
  ]
}
```

Alerts

Acknowledging an Alert

PUT /api/json/v3/commands/alerts/acknowledge/<parameter (alert-guid or alert-index or ?name=alert-name)>

This command (PUT /api/json/v3/commands/alerts/acknowledge/<parameter [alert-guid or alert-index or ?name=alert-name]>) enables you to acknowledge the selected Alert.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
alert-guid	A unique identifier for the Alert.	Select one of the following: • alert-guid • alert-index • alert-name
alert-index	The index of the Alert.	
alert-name	The name of the Alert.	
• cluster-index OR • cluster-name	The Cluster index or name of the Advisory Notice.	• No – for single cluster configurations or if alert-guid is specified • Yes – for multiple cluster configurations and if the alert-guid is not specified

Example Request

```
PUT /api/json/v3/commands/alerts/acknowledge/779957b889e5499d8844c78eb76fda71
HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Alert Definitions

Viewing the List of Alert Definitions

GET /api/json/v3/types/alert-definitions

This command (GET /api/json/v3/types/alert-definitions) displays the list of Alert Definitions.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration OR - a multiple cluster configuration, to specify all clusters - Yes – for a multiple cluster configuration, to specify a specific cluster

Alert Definitions

Example Request

```
GET /api/json/v3/types/alert-definitions HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "alert-definitions": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/alert-definitions/a5173b03e5194b5eb55652b086c01ca9",
      "name": "alert_def_ip_link_user_disabled"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/alert-definitions/4023b89618da4e58b7dd705decff0cc1",
      "name": "alert_def_modify_pending"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/alert-definitions/a806123914764f75a3572b3aa98fd6cc",
      "name": "alert_def_ip_link_inconsistent"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/alert-definitions/d43ced3f80a74805bde1c63be7dc9fa9",
      "name": "alert_def_ip_link_state_initializing"
    }
  ]
}
```

Viewing the Details of an Alert Definition

GET /api/json/v3/types/alert-definitions/<parameter (alert-definition-guid or alert-definitions-index or ?name=alert-definitions-name)>

This command (GET /api/json/v2/types/alert-definitions/<parameter [alert-definitions-guid alert-definitions-index or ?name=alert-definitions-name]>) displays the details of the selected Alert Definition.

For a detailed description of the alert definitions, refer to the XtremIO Storage Array User Guide.

Note: Alert definition names in the RESTful API appear with the "alert_def_" prefix. For example, the "ibswitch_user_disabled" alert appears in the RESTful API as "alert_def_ibswitch_user_disabled".

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
alert-definition-guid	The unique identifier of the Alert Definition.	Select one of the following: • alert-definition-guid • alert-definition-index • alert-definition-name
alert-definition-index	Alert Definition Id	
alert-definition-name	Alert Definition name	

Output Parameter	Description
activity-mode	Indicates whether this alert is enabled or disabled. Values: • enabled • disabled
alert-code	Alert code (the numeric code used to identify all Alerts of this type)
alert-type	The Alert name in words
class-name	The class of the entity reporting the Alert
clearance-mode	Indicates whether this alert is automatically cleared once triggered or the user must acknowledge the alert. Values: • auto_clear • ack_required
guid	
index	
name	
send-to-call-home	Indicates whether to send an SYR notification upon raising this alert. Values: • yes – send SYR notification • no – do not send SYR notification
severity	The severity of the Alert, determined by the Alert Definition severity value.

Alert Definitions

Output Parameter	Description
threshold-type	The role that can modify a threshold-value. Alerts with the threshold type tech can only be modified via a signed script that is run by a tech role user.
threshold-value	The value at which an alert is raised. The valid range for these thresholds is 0 to 100.
user-modified	Indicates whether the alert definition was modified by the user. Values: • true – alert definition was modified by the user • false – alert definition was not modified by the user
xms-id	For the XMS to which this Alert belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/alert-definitions?name=alert_def_ip_link_user_disabled
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  'content':
  {
    'activity-mode': 'enabled',
    'alert-code': '4200202',
    'alert-type': 'alert_def_ip_link_user_disabled',
    'class-name': 'IPLink',
    'clearance-mode': 'auto_clear',
    'guid': 'dd0e0a4d15f645f9bc91e9e3d6dc2de9',
    'index': 1,
    'name': 'alert_def_ip_link_user_disabled',
    'send-to-call-home': 'no',
    'severity': 'information',
    'threshold-type': 'tech',
    'threshold-value': None,
    'user-modified': False,
    'xms-id': ['67e9e1b5743f45dc815e9ab844a682d7', 'xms', 1]
  },
  "links": [
    {
      "guid": "dd0e0a4d15f645f9bc91e9e3d6dc2de9",
      "href": "https://vxms-
xbrickdrm1648/api/json/v3/types/alert-
definitions/dd0e0a4d15f645f9bc91e9e3d6dc2de9",
      "rel": "self"
    }
  ]
}
```

Alert Definitions

Modifying an Alert Definition

PUT /api/json/v3/types/alert-definitions/<parameter (alert-definition-guid or alert-definitions-index or ?name=alert-definitions-name)>

This command (PUT /api/json/v3/types/alert-definition/<parameter[alert-definition-guid or alert-definitions-index or ?name=alert-definitions-name]>) enables you to modify the selected Alert Definition.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
alert-definition-guid	The unique identifier of the Alert Definition.	Select one of the following: • alert-definition-guid • alert-definition-index • alert-definition-name
alert-definition-index	Alert Definition Id	
alert-definition-name	Alert Definition name	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
activity-mode	Indicates whether this alert is enabled or disabled. Values: • enabled • disabled	Select one or more of the following: • activity-mode • clearance-mode • send-to-call-home • severity • threshold
clearance-mode	Indicates whether this alert is automatically cleared once triggered or the user must acknowledge the alert. Values: • auto_clear • ack_required	

Alert Definitions

Input Parameter	Description	Mandatory
send-to-call-home	Indicates whether to send an SYR notification upon raising this alert. Values: - yes – send SYR notification - no – do not send SYR notification	
severity	The level severity for this alert. Values: - clear - information - minor - major - critical	
threshold	The threshold value for this alert. The range is 0 to 100.	

Note: An index number does not exist for this object type.

Example Request

```
PUT /api/json/v3/types/alert-definitions?name=alert_def_cg_modify_pending
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"alert-type":"alert_def_cg_modify_pending","activity-mode":"disabled"}
```

Response

Note: The successful completion of this command returns no response.

BBUs

BBUs

Note: BBUs are available in X1 clusters only.

Viewing the List of BBUs

GET /api/json/v3/types/bbus

This command (GET /api/json/v3/types/bbus) displays the list of BBUs.

Note: This command applies to X1 clusters only.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration OR - a multiple cluster configuration, to specify all clusters - Yes – for a multiple cluster configuration, to specify a specific cluster

Example Request

GET /api/json/v3/types/bbus HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "bbus": [
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/bbus/787de29c3344423bade816879644142f",
      "name": "X1-BBU",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/bbus/a16ec14e60ae420e9331571eae149d14",
      "name": "X2-BBU",
      "sys-name": "xbrick224-rename"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/bbus/",
      "rel": "self"
    }
  ]
}
```

BBUs

Viewing the Details of a BBU

GET /api/json/v3/types/bbus/<parameter (BBU-guid or BBU-index or ?name=BBU-name)>

This command (GET /api/json/v3/types/bbus/<parameter [BBU-guid or BBU-index or ?name=BBU-name]>) displays the details of the selected BBU.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
BBU-guid	A unique identifier for the BBU	Select one of the following: • BBU-guid • BBU-index • BBU-name
BBU-index	The index of the BBU.	
BBU-name	The name of the BBU.	
• cluster-index - OR • cluster-name	The Cluster index or name of the BBU.	• No – for single cluster configurations or if BBU-guid is specified • Yes – for multiple cluster configurations and if the BBU-guid is not specified

Output Parameter	Description
acc-daily-uptime	Daily accumulated uptime. Denotes the duration (in minutes) that the BBU was up, during a 24 hour period.
avg-daily-temp	Daily average temperature.
battery-runtime	BBU runtime (in seconds)
battery-voltage	Battery power, measured in Volts
brick-id	X-Brick's index numberFor the X-Brick to which this BBU belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.

Output Parameter	Description
brick-name	The name of the X-Brick.
enabled-state	Indicates whether the BBU is currently enabled or disabled, either by the user or the cluster.
fru-lifecycle-state	BBU's FRU state, using the generic FRU transition states Values: • <code>healthy</code> - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • <code>failed</code> - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • <code>disconnected</code> - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • <code>uninitialized</code> - An FRU that has not been initialized passes through this state before initialization. • <code>initializing</code> - Indicates a transient state in which the system performs initialization of a component.
fru-replace-failure-reason	Reason why the FRU replacement has failed. <code>null</code> means that the last FRU replacement was either not performed for this object or the replacement was successful.
fw-version	Current firmware version of the BBU
fw-version-error	Reason for FRU diagnostic failure when a firmware problem exists
guid	A unique identifier for the BBU
hw-revision	Hardware level of the power supply unit Note: The value is not always available.
identify-led	Indicates whether the identification LED is illuminated for this BBU. The property value is reflected in the GUI LED icon. Note: There is no identification LED in the current PSU. Values: • <code>off</code> - Identification LED is turned off. • <code>blinking</code> - Identification LED is blinking. • <code>on</code> - Identification LED is turned on. • <code>na</code> - This LED or reading of its value is not supported in the hardware.
index	BBU's index number as defined by the XMS upon its creation (a unique positive number)
index-in-brick	The BBU's index within the X-Brick, either 1 or 2. Always 1 for multiple X-Brick clusters (for all X-Bricks), but two BBUs are available for a single X-Brick cluster.

BBUs

Output Parameter	Description
input-frequency	Input frequency, measured in Hertz
is-bypass-active	Indicates if the BBU bypass is active.
is-low-battery-has-input	Indicates a low battery with power. Cluster undergoes an orderly shutdown when the power is under 70% (if insufficient additional BBUs exist) and will not boot.
is-low-battery-no-input	Indicates a low battery with no input. Cluster emergency shutdown and power-off occur when below 98% (if additional insufficient BBUs exist).
is-low-battery-runtime	Low battery runtime has been detected.
is-ups-overload	The BBU is overloaded.
location-index	The physical location of the BBU.
model-name	Vendor-assigned BBU model name
monitoring-nodes-obj-id-list	The Storage Controller IDs that monitor the BBU. For a multiple X-Brick system this is a list of size 2 (for all X-Bricks). For a single X-Brick system this is a list of size 1.
name	BBU's name
obj-severity	BBU severity, based on severity level of current Alerts (Alerts still uncleared) for this BBU Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
outlet1-status	BBU Status (the status of the power output of BBU 1, read from the BBU)
outlet2-status	BBU Status (the status of the power output of BBU 2, read from the BBU)
output-current	Output current, measured in Amps
output-frequency	Output frequency, measured in Hertz
output-voltage	Output voltage
part-number	Part number. An Dell EMC-assigned string identifying part (SKU). Independent of the actual vendor model name used for this FRU.
power	Power, measured in Watts

Output Parameter	Description
power-feed	A and B PSU power feeds. Power into PSU typically has two feeds: A and B Typical configuration: - The first InfiniBand Switch PSU is connected to feed_A. - The second InfiniBand Switch PSU is connected to feed_B.
real-power	Real power, measured in Watts
serial-number	BBU's serial number
status-led	LED state indicating BBU object faults
sys-id	For the cluster to which this BBU belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined. The index number of the cluster this BBU belongs to. May be omitted if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. May be omitted if only one cluster is defined.
tag-list	List of Tags
ups-alarm	BBU alarm. Used to display specific BBU alarms. PM may use this information to calculate fru_lifecycle_state.
ups-battery-charge-in-percent	The percentage of BBU battery charge. If the BBU is unreachable or disabled, this parameter value is null
ups-battery-charge-in-percent	The percentage of UPS battery charge. If the UPS is unreachable or disabled, this property is NULL.
ups-conn-state	States of the control connection between the Storage Controller and the BBU. Each Storage Controller reports either connected or disconnected. Sym determines the values reported by Storage Controller 1 and Storage Controller 2 to determine if disconnected.
ups-id	For this BBU, a tuple array containing the following parameters (in the following order): the BBU's object GUID identifier, the BBU name, and the BBU index. BBU index number
ups-input	The BBU external power feed
ups-load-in-percent	The current BBU load given in percent
ups-load-percent-level	Event triggered for any change in this parameter
ups-need-battery-replacement	Indicates if the BBU battery needs to be replaced.
ups-status	Status information read from the BBU
ups-voltage	The input voltage of the BBU. Parameter value is null if BBU is unreachable or disabled.

BBUs

Output Parameter	Description
xms-id	For the XMS to which this BBU belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.The index number of the XMS object

Example Request

```
GET /api/json/v3/types/bbus/c72fd4f74cc64ee798e218af60ce1ec HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

BBUs

Response

```
{
  "content": {
    "fru-lifecycle-state": "healthy",
    "fw-version-error": "no_error",
    "outlet2-status": "on",
    "is-low-battery-has-input": "false",
    "obj-severity": "information",
    "sys-index": 2,
    "power-feed": "PWR-A",
    "serial-number": "G299F07036",
    "enabled-state": "enabled",
    "ups-alarm": "not found",
    "location-index": 1,
    "fru-replace-failure-reason": "",
    "guid": "c72fd4f74cc64ee798e218af60cbe1ec",
    "is-low-battery-runtime": "false",
    "output-frequency": 59.9000015259,
    "index-in-brick": 1,
    "acc-daily-uptime": 1432,
    "index": 1,
    "is-ups-overload": "false",
    "ups-voltage": 214,
    "battery-voltage": 0.0,
    "battery-runtime": 1738,
    "ups-conn-state": "connected",
    "identify-led": "na",
    "brick-name": "X1",
    "hw-revision": "",
    "outlet1-status": "on",
    "ups-battery-charge-in-percent": 100,
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "power": 257,
    "is-bypass-active": "false",
    "output-voltage": 214.5,
    "tag-list": [],
    "avg-daily-temp": 29,
    "fw-version": "02.08.0016",
    "sys-name": "xbrickdrm847",
    "real-power": 253,
    "part-number": "078-000-122",
    "monitoring-nodes-obj-id-list": [
      [
        "849eeb1830e94c7586ca201c59f6609a",
        "X1-SC1",
        1
      ],
      [
        "7c2d52656e656e2048616c6c616b2d7c",
        ""
      ]
    ]
  }
}
```

```

    0
  ]
},
"ups-load-in-percent": 23,
"sys-id": [
  "3139f69b7b0e4b21a013bf1c45d4fb00",
  "xbrickdrm847",
  2
],
"ups-status": "OL CHRG",
"ups-input": "on",
"name": "X1-BBU",
"ups-id": [
  "c72fd4f74cc64ee798e218af60cbe1ec",
  "X1-BBU",
  1
],
"brick-id": [
  "e2ee8c88151b491489e9ca86e37658b7",
  "X1",
  1
],
"output-current": 1.2000000477000001,
"status-led": "na",
"input-frequency": 59.9000015259,
"is-low-battery-no-input": "false",
"ups-need-battery-replacement": "false",
"model-name": "Eaton 5P 1550",
"ups-load-percent-level": "ok",
"brick-index": 1
},
"links": [
  {
    "guid": "c72fd4f74cc64ee798e218af60cbe1ec",
    "href": "https://vxms-
xbrickdrm919/api/json/v3/types/bbus/c72fd4f74cc64ee798e218af60cbe1ec",
    "rel": "self"
  }
]
}-

```

Clusters

Clusters

Viewing the List of Managed Clusters

GET /api/json/v3/types/clusters

This command (GET /api/json/v3/types/clusters) displays the information of the cluster currently being managed.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example Request

```
GET /api/json/v3/types/clusters HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
"clusters": [
{
  "href": "https://vxms-
xbrickdrm919/api/json/v3/types/clusters/7e0bbd4b7d69477ab32e2953636a70de",
  "name": "xbrickdrm919"
},
{
  "href": "https://vxms-
xbrickdrm919/api/json/v3/types/clusters/3139f69b7b0e4b21a013bf1c45d4fb00",
  "name": "xbrickdrm847"
}
],
"links": [
{
  "href": "https://vxms-xbrickdrm919/api/json/v3/types/clusters/",
  "rel": "self"
}
]
```

Viewing the Details of a Managed Cluster

GET /api/json/v3/types/clusters/<parameter (cluster-guid or cluster-index or ?name=cluster-name)>

This command (GET /api/json/v3/types/clusters/<parameter [cluster-guid or cluster-index or ?name=cluster-name]>) displays the cluster information.

Note: For multiple cluster configurations, using a cluster index or name instead of an object GUID identifier is still supported. However, the object GUID identifier is highly recommended, because it is unique in-cluster and between clusters.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
cluster-guid	A unique identifier for the cluster.	Select one of the following: - cluster-guid - cluster-index - cluster name
cluster-index	The index of the cluster.	
cluster-name	The name of the cluster.	

Output Parameter	Description
acc-num-of-rd	Cluster's total lifespan cumulative read I/Os

Clusters

Output Parameter	Description
acc-num-of-small-rd	Accumulated number of small reads input/output operations for the cluster
acc-num-of-small-wr	Accumulated number of small writes input/output operations contained by this cluster
acc-num-of-unaligned-rd	Cluster's accumulated number I/Os since adding the Initiator
acc-num-of-unaligned-wr	Cluster's total number of accumulated unaligned writes
acc-num-of-wr	Accumulative number of write operations having occurred during the cluster's lifespan
acc-size-of-rd	Accumulative capacity KB size of read operations during the cluster's lifespan
acc-size-of-wr	Accumulative capacity KB size of write operations having occurred during the cluster's lifespan
avg-latency	Real-time average latency of read and write operations, measured in μ s
avg-latency-128kb	Average latency time for 128KB blocks, measured in μ s
avg-latency-16kb	Average latency time for 16KB blocks, measured in μ s
avg-latency-1kb	Average latency time for 1KB blocks, measured in μ s
avg-latency-1mb	Average latency time for 1MB blocks, measured in μ s
avg-latency-256kb	Average latency time for 256KB blocks, measured in μ s
avg-latency-2kb	Average latency time for 2KB blocks, measured in μ s
avg-latency-32kb	Average latency time for 32KB blocks, measured in μ s
avg-latency-4kb	Average latency time for 4KB blocks, measured in μ s
avg-latency-512b	Average latency time for 512B blocks, measured in μ s
avg-latency-512kb	Average latency time for 512KB blocks, measured in μ s
avg-latency-64kb	Average latency time for 64KB blocks, measured in μ s
avg-latency-8kb	Average latency time for 8KB blocks, measured in μ s
avg-latency-gt1mb	Average latency time of the entire cluster, for block sizes greater than 1MB
brick-list	The cluster's list of X-Bricks
bw	Cluster's total real-time read and write bandwidth, measured in KB per second
bw-by-block	Cluster's current aggregated bandwidth

Output Parameter	Description
chap-authentication-mode	Describes the CHAP (Challenge-Handshake Authentication Protocol) mode for Initiator authentication (applicable for iSCSI only).
chap-discovery-mode	Describes the CHAP mode for Initiator discovery (applicable for iSCSI only).
cluster-expansion-in-progress	Indicates if cluster expansion is in progress. Values: - false - cluster expansion is not underway. - true - cluster expansion is underway.
compression-factor	Cluster-wide compression factor reflecting the overall space saving effects of compression
compression-factor-text	Compression factor text. Cluster-wide compression factor, reflecting the overall space-saving effects of compression, represented by a ratio of X:1. Presented with 1 decimal digit, append ':1' to the value. e.g: A value of 4.2 shows 4.2:1.
compression-mode	Shows the compression mode (always enabled).
configurable-vol-type-capability	Denotes whether the cluster supports the capability to configure a Volume's vol-access. Values: - supported - unsupported
consistency-state	Indicates detection of data consistency error.
dae-temperature-monitor-mode	Indicates whether the DAE monitoring and temperature based HA is enabled. Values: - enabled - disabled
data-reduction-ratio	The ratio of actual used Volume capacity to used physical capacity in this cluster
data-reduction-ratio-text	An X:1 representation of the parameter (X= data-reduction-ratio)
debug-create-timeout	Determines whether the XMS uses long or normal timeout period for the create-debuginfo command. Values: - normal - Default XMS timeout - long - Long XMS timeout
dedup-ratio	Cluster's current ratio of deduplication space in use to total logical space in use
dedup-ratio-text	Cluster's total deduplication ratio
dedup-space-in-use	This parameter is no longer supported.

Clusters

Output Parameter	Description
device-connectivity-mode	Defines the SCSI behavior towards initiators with OS type of ESX, during system stop. Values: - enable - disable
encryption-mode	Controls whether encryption (Data at Rest) is performed for all cluster SSDs, DAE SSDs and Local Disks.
encryption-supported	The capability parameter reflects whether Data at Rest encryption is possible for this cluster.
esrsve-conn-status	Indicates whether this clusters is connected to the esrsve primary gateway. Values: - online - offline - unknown
esrsve-conn-status-secondary	Indicates whether this clusters is connected to the esrsve primary gateway. Values: - online - offline - unknown
fc-port-speed	Fibre Channel port speed. The speed used by all Fibre Channel target ports. If all ports do not perform at the same speed, the value is inconsistent.
firmware-upgrade-failure-reason	The reason for a firmware upgrade failure.
free-ud-ssd-space-in-percent	Monitors the percentage of the cluster's free UD SSD space.
free-ud-ssd-space-level	Monitors the free UD SSD space utilization levels
gates-open	Indicates whether gates are open. The cluster is active and IO is allowed. In some HA flows, the cluster may be active but IOs are not allowed. Values: - true - false

Output Parameter	Description
hardware-platform	The type of cluster hardware platform. Values: • X1 • X2
ib-switch-list	Number of InfiniBand Switches in the cluster and the list of their object IDs
installation-type	Indicates whether the cluster installation is standard or RPQ was made. Values: • Standard Installation • RPQ
installation-type-details	Details describing the installation type.
index	Cluster's unique index number as defined by the XMS upon its creation
lops	Input/output per second (cluster's total read and write real-time input/output operations per second)
iops-by-block	Input/output per second by block (current aggregated input/output per second, handled by all clusters managed by the XMS)
is-any-c-mdl-lazy-load-in-progress	Indicates whether any C Mdl lazy load is in progress. Values: • true • false
is-any-d-mdl-lazy-load-in-progress	Indicates whether any D Mdl lazy load is in progress. Values: • true • false
iscsi-port-speed	The negotiated speed of all iSCSI Target ports. The same value should be for all target ports. An Alert is issued, when inconsistent. Values: • not_in_use • inconsistent • 10mb • 100mb • 1gb • 10gb
iscsi-tcp-port	The listen port for iSCSI. The default value is 3260 .
last-query-discovered-initiator-connectivity-timestamp	The timestamp (UTC) of the latest discovered-initiator command. The timestamp is zero if the discover initiator command has never been executed or after an XMS reboot.

Clusters

Output Parameter	Description
last-query-initiator-connectivity-timestamp	The timestamp (UTC) of the latest initiator command. The timestamp is zero if the discover initiator command has never been executed or after an XMS reboot.
last-upgrade-attempt-timestamp	Timestamp (UTC) of the last attempted upgrade
last-upgrade-attempt-version	Software version of the last attempted upgrade
license-id	Cluster's license index number
logical-space-in-use	Total logical address space written to the cluster before deduplication, measured in KB
max-cgs	The maximum number of Consistency Groups allowed in the system.
max-cgs-per-vol	Maximum Consistency Groups per Volume.
max-data-transfer-percent-done	The estimated time remaining for a cluster expansion procedure to complete, as a percentage
max-igs	The amount of initiator groups that currently exist in the system.
max-initiators	The maximum number of initiators allowed in the system.
max-initiators-in-igs	The maximum number of initiators allowed per IG.
max-mapped-volumes	The maximum number of mapped Volumes allowed.
max-mappings	The maximum number of mappings allowed in the system.
max-num-of-ssds-per-rg	The maximum number of SSDs a DPG can contain
max-num-schedulers	The maximum number of schedulers allowed in the system.
max-snapshots-per-vol	The maximum number of Snapshots per Volume
max-snapshots-per-volume	The maximum Snapshots for a Volume This the maximum number of Volumes allowed per vsd.
max-volumes	The maximum number of Volumes that can be created in the system. This includes Volumes and Snapshots.
max-volumes-per-cg	The maximum number of Volumes that may be placed in a Consistency Group.
memory-recovery-status	Reflects the current state of the activate_cluster_memory recovery command.
mode-switch-new-mode	Describes the most recent encryption_mode applied.
mode-switch-status	Current state of encryption mode being changed
naa-sys-id	A Volume's SCSI NAA name consisting of three elements

Output Parameter	Description
name	Cluster's name
node-list	A list of the X-Brick's Storage Controllers.
num-of-bricks	Cluster's total number of X-Bricks
num-of-critical-alerts	The number of critical Alerts in the cluster
num-of-ib-switches	Cluster's total number of InfiniBand Switches
num-of-initiators	The number of Initiators belonging to this cluster
num-of-internal-vols	Indicates the number of internal Volumes in this cluster, created by external entities such as RecoverPoint or ODX. The return value is dependent upon the type of user performing the request as follows: - tech users – the number of RecoverPoint and ODX internal Volumes - RecoverPoint users – the number of RecoverPoint internal Volumes, only - ODX – the number of ODX internal Volumes, only - Regular XMS users – no internal Volumes
num-of-jbods	Cluster's list of disk array enclosures (DAEs)
num-of-major-alerts	The number of major Alerts in the cluster
num-of-minor-alerts	The number of the XMS's minor Alerts
num-of-nodes	Total number of the cluster's Storage Controllers
num-of-rgs	Number of the cluster's Data Protection Groups (DPGs)
num-of-ssds	Total number of the cluster's SSDs
num-of-tars	Total number of the cluster's target ports
num-of-tgs	Total number of the cluster's Target Groups
num-of-upses	Total number of the cluster's BBUs
num-of-vols	Total number of the cluster's provisioned Volumes
num-of-xenvs	Total number of the cluster's XEnvs
obfuscate-debug	Determines whether debug information is created while obfuscating IP addresses. Default is disabled. Debug information is placed in the log bundle.

Clusters

Output Parameter	Description
obj-severity	Cluster's severity, based on severity level of current Alerts (Alerts still uncleared) for this cluster and its contained objects Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
os-upgrade-in-progress	Indicates if an operating system upgrade (for all Storage Controllers in the cluster) is currently in progress. Values: • false - OS upgrade is not underway. • true - OS upgrade is underway.
psnt-part-number	The PSNT, read from the Storage Controller
rd-bw	Cluster's total real-time read bandwidth in MB per second
rd-bw-128kb	Read bandwidth for 128KB size blocks
rd-bw-16kb	Read bandwidth for 16KB size blocks
rd-bw-1kb	Read bandwidth for 1KB size blocks
rd-bw-1mb	Read bandwidth for 1MB size blocks
rd-bw-256kb	Read bandwidth for 256KB size blocks
rd-bw-2kb	Read bandwidth for 2KB size blocks
rd-bw-32kb	Read bandwidth for 32KB size blocks
rd-bw-4kb	Read bandwidth for 4KB size blocks
rd-bw-512b	Read bandwidth for 512B size blocks
rd-bw-512kb	Read latency time for 512KB size blocks, measured in μ s
rd-bw-64kb	Read bandwidth for 64KB size blocks
rd-bw-8kb	Read bandwidth for 8KB size blocks
rd-bw-by-block	Current aggregated bandwidth handled by all the clusters
rd-bw-gt1mb	Read time bandwidth of the entire cluster, for block sizes greater than 1MB
rd-iops	Cluster's total read real-time input/output operations per second

Clusters

Output Parameter	Description
rd-iops-128kb	Current input/output per second for 128KB block size handled by the clusters
rd-iops-16kb	Current input/output per second for 16KB block size handled by the clusters
rd-iops-1kb	Current input/output per second for 1KB block size handled by clusters
rd-iops-1mb	Current input/output per second for 1MB block size handled by the clusters
rd-iops-256kb	Current input/output per second for 256KB block size handled by the clusters
rd-iops-2kb	Current input/output per second for 2KB block size handled by the clusters
rd-iops-32kb	Current input/output per second for 32KB block size handled by the clusters
rd-iops-4kb	Current input/output per second for 4KB block size, handled by the clusters
rd-iops-512b	Current input/output per second for 512B block size handled by the clusters
rd-iops-512kb	Current input/output per second for 512KB block size handled by the clusters
rd-iops-64kb	Current input/output per second for 64KB block size, handled by the clusters
rd-iops-8kb	Current input/output per second for 8KB block size handled by the clusters
rd-iops-by-block	Current aggregated input/output per second handled by all clusters managed by the XMS
rd-iops-gt1mb	Read time of the entire cluster, for block sizes greater than 1MB
rd-latency	Cluster's total real-time average latency of read operations, measured in μ s
rd-latency-128kb	Read latency time for 128KB size blocks, measured in μ s
rd-latency-16kb	Read latency time for 16KB size blocks, measured in μ s
rd-latency-1kb	Read latency time for 1KB size blocks, measured in μ s
rd-latency-1mb	Read latency time for 1MB size blocks, measured in μ s
rd-latency-256kb	Read latency time for 256KB size blocks, measured in μ s
rd-latency-2kb	Read latency time for 2KB size blocks, measured in μ s
rd-latency-32kb	Read latency time for 32KB size blocks, measured in μ s
rd-latency-4kb	Read latency time for 4KB size blocks, measured in μ s
rd-latency-512b	Read latency time for 512B size blocks, measured in KB per second

Clusters

Output Parameter	Description
rd-latency-512kb	Read latency time for 512KB size blocks, measured in μ s
rd-latency-64kb	Read latency time for 64KB size blocks, measured in μ s
rd-latency-8kb	Read latency time for 8KB size blocks, measured in μ s
rd-latency-gt1mb	Latency read time of the entire cluster, for block sizes greater than 1MB
replication-efficiency-ratio	A ratio indicating the efficiency of the replication due to hash usage and not sending all of the actual pages. This is calculated by SYM and takes into account all active remote-protection sessions on this cluster. The ratio value is from 0 to 100, where 100 indicates all hash and 0 indicates all full pages.
sc-fp-temperature-monitor-mode	Storage Controller front panel temperature monitor mode (the parameter used to disable the feature if the front panel sensor is faulty)
shared-memory	The total shared memory pool allocated by the system to cluster, in MB.
shared-memory-in-use-ratio-level	Used to monitor the shared memory utilization levels based on: <code>shared_memory_in_use_ratio</code>
shared-memory-in-use-recoverable-ratio-level	Used for low shared memory conditions, where a module's restart reclaims significant unused memory.
size-and-capacity	Cluster's total physical capacity. The total physical capacity is shown as "X Brick & YTB", where X is number of bricks in cluster and y is total capacity (rounded down) over all bricks in cluster).
small-bw	Current bandwidth of small input/output operations, addressed at the Volume
small-iops	Current small input/output operations per second
small-rd-bw	Current bandwidth of small input/output operations, addressed at the Volume
small-rd-iops	Current small read input/output operations per second
small-wr-bw	Current small write bandwidth
small-wr-iops	Current small write input/output operations per second
space-in-use	Cluster's total physical capacity used as user data (KB)

Output Parameter	Description
space-saving-ratio	Cluster's space saving ratio: <code>dedup_space_in_use / vol_size</code> Note: - Smaller numbers are the best for compression. 0/0 = 0 (while cluster is without Volumes). - Changes when Snapshots are created. For example, if one Volume exists with blocks as non-zero and unique and 100 Snapshots are created, the parameter changes from 1 to 0.01 (a feature, not a bug). - Counter does not have a Snapshot-Group equivalent.
ssd-high-utilization-thld-crossing	Triggers a user threshold crossing Alert for high SSD utilization.
ssd-space-in-use	The actual number of Kbytes written by the user to the SSD. The Kbyte calculation occurs after compression. This is the actual physical consumption of blocks.
ssd-very-high-utilization-thld-crossing	Triggers a user threshold crossing Alert for very high SSD utilization.
ssh-firewall-mode	Determines whether a limitation on SSH connections is enforced. Values: - locked - SSH Firewall Mode is locked. - unlocked - SSH Firewall Mode is unlocked.
stopped-reason	The reason reported as to why <code>sys_state</code> is stopped
sys-activation-timestamp	Cluster's activation uptime timestamp as of 1.1.1970, measured in seconds
sys-health-state	Not in use. <code>sys-health-state</code> is a future output option. Do not use until further notification. Note: The correct method for gauging the cluster's health is by monitoring the cluster components' <code>fru-lifecycle-state</code> output parameter value, as follows: - When the <code>fru-lifecycle-state</code> value is healthy, the component's health state equals the value of the <code>obj-severity</code> output parameter. - When <code>fru-lifecycle-state</code> value is not healthy, the component's health state equals the value of the <code>fru-lifecycle-state</code> output parameter.
sys-id	For the cluster, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index.
sys-index	The physical index of the system to which the object belongs.
sys-mgr-conn-error-reason	Reason for disconnection from the cluster manager

Clusters

Output Parameter	Description
sys-mgr-conn-state	Current connection status between the XMS and the cluster's manager
sys-psnt-serial-number	Cluster's Product Serial Number tag (PSNT) serial number
sys-start-timestamp	Timestamp (in UTC) of the cluster's commencement. Values: measured in seconds since 1.1.1970
sys-state	Cluster's health state according to the XMS
sys-stop-type	Describes the nature of the current or last cluster stop.
sys-sw-version	XIOS version (the XtremAPP software version currently running on the Storage Controllers)
tag-list	List of Tags
thin-provisioning-ratio	The ratio of the total provisioned capacity to the logical space in use
total-memory-in-use	Represents the total amount of the memory pool currently in use by shared memory pools, in MB.
total-memory-in-use-in-percent	Represents the total amount (as a percent) of the memory pool currently in use by shared memory pools.
ud-ssd-space	Total user data space on the SSDs
ud-ssd-space-in-use	Specifies how much user data SSD space is in use, in Kbytes.
unaligned-bw	Current IOPS of unaligned bandwidth input/output operations
unaligned-iops	Unaligned input/output operations per second
unaligned-rd-bw	Current bandwidth of unaligned read input/output operations
unaligned-rd-iops	Current IOPS of unaligned read input/output operations
unaligned-wr-bw	Current bandwidth of unaligned write input/output operations
unaligned-wr-iops	Current IOPS of unaligned write input/output operations per second
under-maintenance	Indicates that the cluster is under maintenance.
upgrade-failure-reason	Shows permanent error of last upgrade attempts: Empty if previous attempt successful, if no previous upgrade command given, or upgrade currently in process
upgrade-state	The state of the last upgrade process for this Storage Controller
useful-ssd-space-per-ssd	User data space per SSD, measured in Kbytes
vaai-tp-limit	The threshold used to trigger the VAAI Thin Provisioning Space Threshold Space The values are from 0 to 100, where a value of 100 will trigger no warning (the same as disabling the VAAI feature of soft limit warning).

Output Parameter	Description
vaai-tp-limit-crossing	vStorage APIs for Array Integration (VAAI) thin provisioning limit crossing. Triggers notification to XMS user when thin provisioning limit is crossed.
volumes-performance-data-collection	Indicates whether performance data is collected for all Volumes in this cluster. If performance data collection is disabled on the cluster level, specific Volume's performance data collection can be enable. However, if performance data collection is enabled on the cluster level, specific Volumes cannot be disabled. The default is enabled. Values: - enabled – all Volumes performance data is collected - disabled – no Volumes performance data is collection.
vol-size	Total provisioned capacity. Volume size (in KB) as exposed to Initiators
wr-bw	Cluster's total real-time write bandwidth in MB per second
wr-bw-128kb	Write bandwidth for 128KB block size
wr-bw-16kb	Write bandwidth for 16KB block size
wr-bw-1kb	Write bandwidth for 1KB block size
wr-bw-1mb	Write bandwidth for 1MB block size
wr-bw-256kb	Write bandwidth for 256KB block size
wr-bw-2kb	Write bandwidth for 2KB block size
wr-bw-32kb	Write bandwidth for 32KB block size
wr-bw-4kb	Write bandwidth for 4KB block size
wr-bw-512b	Write bandwidth for 512B block size
wr-bw-512kb	Write bandwidth for 512KB block size
wr-bw-64kb	Write bandwidth for 64KB block size
wr-bw-8kb	Write bandwidth for 8KB block size
wr-bw-by-block	Cluster's current bandwidth, used to get a Snapshot of the aggregated totals by block size
wr-bw-gt1mb	Write bandwidth of the entire cluster, for block sizes greater than 1MB
wr-iops	Total write real-time input/output operations per second
wr-iops-128kb	Current input/output per second for 128KB block size handled by all clusters
wr-iops-16kb	Current input/output per second for 16KB block size handled by all clusters
wr-iops-1kb	Current input/output per second for 1KB block size handled by all clusters
wr-iops-1mb	Current input/output per second for 1MB block size handled by all clusters

Clusters

Output Parameter	Description
wr-iops-256kb	Current input/output per second for 256KB block size handled by all clusters
wr-iops-2kb	Current input/output per second for 2KB block size handled by all clusters
wr-iops-32kb	Current input/output per second for 32KB block size handled by all clusters
wr-iops-4kb	Current input/output per second for 4KB block size handled by all clusters
wr-iops-512b	Current input/output per second for 512B block size handled by all clusters
wr-iops-512kb	Current input/output per second for 512KB block size handled by all clusters
wr-iops-64kb	Current input/output per second for 64KB block size handled by all clusters
wr-iops-8kb	Current input/output per second for 8KB block size handled by all clusters
wr-iops-by-block	Current input/output per second, handled by the cluster. A parameter used to get a Snapshot of the aggregated totals by block size.
wr-iops-gt1mb	Write input/output per second of the entire cluster, for block sizes greater than 1MB
wr-latency	Cluster's total real-time average latency of write operations, measured in μ s
wr-latency-128kb	Write latency time for 128KB size blocks, measured in μ s
wr-latency-16kb	Write latency time for 16KB size blocks, measured in μ s
wr-latency-1kb	Write latency time for 1KB size blocks, measured in μ s
wr-latency-1mb	Write latency time for 1MB size blocks, measured in μ s
wr-latency-256kb	Write latency time for 256KB size blocks, measured in μ s
wr-latency-2kb	Write latency time for 2KB size blocks, measured in μ s
wr-latency-32kb	Write latency time for 32KB size blocks, measured in μ s
wr-latency-4kb	Write latency time for 4KB size blocks, measured in μ s
wr-latency-512b	Write latency time for 512B size blocks, measured in μ s
wr-latency-512kb	Write latency time for 512KB size blocks, measured in μ s
wr-latency-64kb	Write latency time for 64KB size blocks, measured in μ s
wr-latency-8kb	Write latency time for 8KB size blocks, measured in μ s
wr-latency-gt1mb	Latency write time of the entire cluster, for block sizes greater than 1MB

Output Parameter	Description
xms-id	For the XMS to which this cluster belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

GET /api/json/v3/types/clusters/4b7891fe67be4c00b7c9c194c54150eb HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Clusters

Response

```
{
  "content": {
    "compression-factor-text": "2.6:1",
    "os-upgrade-in-progress": "false",
    "ssh-firewall-mode": "unlocked",
    "rd-iops-32kb": "0",
    "num-of-initiators": 10,
    "obj-severity": "major",
    "dae-temperature-monitor-mode": "enabled",
    "rd-bw": "0",
    "num-of-rgs": 2,
    "total-memory-in-use-in-percent": 0,
    "iops": "0",
    "last-upgrade-attempt-version": "",
    "max-initiators-in-igs": 128,
    "free-ud-ssd-space-level": "healthy",
    "avg-latency-512kb": "0",
    "volumes-performance-data-collection": "disabled",
    "wr-bw-32kb": "0",
    "rd-latency-256kb": "0",
    "num-of-nodes": 2,
    "wr-bw-by-block": "0",
    "rd-latency-512b": "0",
    "rd-iops-1kb": "0",
    "iscsi-port-speed": "invalid",
    "memory-recovery-status": "inactive_failed",
    "max-snapshots-per-volume": 512,
    "debug-create-timeout": "normal",
    "num-of-minor-alerts": 0,
    "gates-open": true,
    "compression-factor": 2.5822615178,
    "rd-iops-64kb": "0",
    "shared-memory-in-use-recoverable-ratio-level": "healthy",
    "device-connectivity-mode": "apd",
    "wr-bw-16kb": "0",
    "rd-iops-8kb": "0",
    "hardware-platform": "x2",
    "num-of-vols": 62,
    "wr-iops-by-block": "0",
    "avg-latency-1mb": "0",
    "max-mappings": 16384,
    "avg-latency-256kb": "0",
    "wr-latency-512kb": "0",
    "tag-list": [],
    "rd-bw-128kb": "0",
    "odx-mode": "enabled",
    "wr-iops": "0",
    "wr-latency-64kb": "0",
    "cluster-expansion-in-progress": "no",
    "wr-bw-gt1mb": "0",
    "name": "xbrickdrm1652",
    "max-initiators": 1024,
    "num-of-tars": 10,
    "num-of-ib-switches": 0,
  }
}
```

```

"acc-num-of-unaligned-wr": "7395",
"dedup-ratio-text": "1.0:1",
"rd-iops-4kb": "0",
"acc-num-of-wr": "3997827263",
"wr-latency-1mb": "0",
"acc-size-of-rd": "21487972329",
"wr-latency-4kb": "0",
"dedup-ratio": 1.0,
"rd-latency-1mb": "0",
"avg-latency-512b": "0",
"sys-sw-version": "6.2.0-61_X2",
"rd-latency-16kb": "0",
"rd-bw-512b": "0",
"max-data-transfer-percent-done": 0,
"shared-memory": 0,
"avg-latency-2kb": "0",
"wr-bw-128kb": "0",
"admission-control-mode": "disabled",
"mode-switch-new-mode": "self",
"index": 1,
"rd-iops-256kb": "0",
"rd-latency-gt1mb": "0",
"max-cgs-per-vol": 4,
"free-ud-ssd-space-in-percent": 99,
"wr-latency-256kb": "0",
"upgrade-failure-reason": "",
"wr-bw-1kb": "0",
"wr-iops-gt1mb": "0",
"last-upgrade-attempt-timestamp": "",
"acc-num-of-small-rd": "148127",
"ssd-high-utilization-thld-crossing": "healthy",
"rd-bw-4kb": "0",
"num-of-xenvs": 4,
"sys-stop-type": "none",
"stopped-reason": "none",
"wr-iops-32kb": "0",
"configurable-vol-type-capability": "supported",
"xms-id": [
  "76aab098d95a48beafd5a6b75c8a2ec5",
  "xms",
  1
],
"rd-iops-gt1mb": "0",
"wr-latency-gt1mb": "0",
"small-wr-bw": "0",
"num-of-ssds": 18,
"mode-switch-status": "none",
"sys-start-timestamp": 1530445564,
"sys-health-state": "healthy",
"bw": "0",
"esrsv-conn-status": "offline",
"avg-latency-64kb": "0",
"wr-bw-512kb": "0",
"send-snmp-heartbeat": true,
"installation-type": "standard_installation",
"last-query-initiator-connectivity-timestamp": 1530638200.297922,
"avg-latency": "0",
"total-memory-in-use": 0,
"upgrade-state": "fw_upgrade_succeeded",

```

Clusters

```

"rd-iops-128kb": "0",
"rd-latency-1kb": "0",
"rd-bw-gt1mb": "0",
"ud-ssd-space-in-use": "36317455",
"num-of-jbods": 1,
"license-id": "LIC123456789",
"wr-bw-512b": "0",
"avg-latency-8kb": "0",
"wr-iops-128kb": "0",
"unaligned-wr-iops": "0",
"admission-control-qos-policy-id": null,
"data-reduction-ratio-text": "2.6:1",
"wr-bw": "0",
"num-of-tgs": 1,
"rd-bw-1kb": "0",
"wr-bw-64kb": "0",
"obfuscate-debug": "disabled",
"wr-latency": "0",
"rd-latency-8kb": "0",
"small-iops": "0",
"wr-bw-2kb": "0",
"avg-latency-1kb": "0",
"unaligned-rd-bw": "0",
"small-rd-iops": "0",
"max-cgs": 512,
"rd-bw-by-block": "0",
"ud-ssd-space": "5358306912",
"wr-bw-8kb": "0",
"max-snapshots-per-vol": 1024,
"wr-iops-512b": "0",
"rd-iops-512b": "0",
"acc-num-of-small-wr": "2996",
"guid": "4b7891fe67be4c00b7c9c194c54150eb",
"useful-ssd-space-per-ssd": "390625000",
"acc-num-of-rd": "1343109354",
"data-reduction-ratio": 2.5822615178,
"wr-bw-1mb": "0",
"ssd-very-high-utilization-thld-crossing": "healthy",
"rd-iops-16kb": "0",
"acc-size-of-wr": "64022119644",
"shared-memory-in-use-ratio-level": "healthy",
"num-of-internal-vols": 0,
"rd-bw-2kb": "0",
"rd-iops-by-block": "0",
"installation-type-details": "",
"chap-authentication-mode": "disabled",
"bw-by-block": "0",
"under-maintenance": false,
"small-wr-iops": "0",
"chap-discovery-mode": "disabled",
"wr-iops-1mb": "0",
"psnt-part-number": "900-586-007",
"wr-latency-2kb": "0",
"rd-bw-16kb": "0",
"acc-num-of-unaligned-rd": "36918",
"iscsi-tcp-port": 3260,
"wr-iops-2kb": "0",

```



```

"sc-fp-temperature-monitor-mode": "enabled",
"sys-mgr-conn-state": "connected",
"rd-bw-512kb": "0",
"last-query-discovered-initiator-connectivity-timestamp":
1530633529.60705,
"wr-latency-128kb": "0",
"unaligned-rd-iops": "0",
"rd-latency-512kb": "0",
"rd-bw-64kb": "0",
"sys-id": [
  "4b7891fe67be4c00b7c9c194c54150eb",
  "xbrickdrm1652",
  1
],
"max-mapped-volumes": 32768,
"replication-rd-iops-16kb": "0",
"size-and-capacity": "1 Bricks & 6TB",
"max-igs": 1024,
"rd-bw-1mb": "0",
"rd-latency-4kb": "0",
"avg-latency-4kb": "0",
"sys-activation-timestamp": 1521740711,
"wr-latency-512b": "0",
"wr-iops-256kb": "0",
"max-num-schedulers": 256,
"brick-list": [
  [
    "f3c3795c03e64b369e6068b1c86cbb8e",
    "x1",
    1
  ]
],
"rd-latency-32kb": "0",
"rd-latency-64kb": "0",
"rd-bw-32kb": "0",
"wr-bw-256kb": "0",
"rd-latency-2kb": "0",
"fc-port-speed": "16GFC",
"replication-wr-iops-16kb": "0",
"space-saving-ratio": 0.0004844415,
"compression-mode": "enabled",
"vaai-tp-limit-crossing": "healthy",
"wr-latency-16kb": "0",
"is-any-d-mdl-lazy-load-in-progress": false,
"sys-index": 1,
"wr-iops-512kb": "0",
"avg-latency-128kb": "0",
"space-in-use": 0,
"logical-space-in-use": "0",
"vaai-tp-limit": 0,
"rd-iops-1mb": "0",
"esrsve-conn-status-secondary": "offline",
"max-volumes": 16384,
"is-any-c-mdl-lazy-load-in-progress": false,
"qos-exceeded-bw": "0",
"sys-psnt-serial-number": "XI000171313881",
"wr-iops-1kb": "0",
"rd-latency-128kb": "0",
"encryption-mode": "self",

```

Clusters

```

    "rd-bw-8kb": "0",
    "avg-latency-gt1mb": "0",
    "rd-bw-256kb": "0",
    "thin-provisioning-ratio": 0.0,
    "sys-mgr-conn-error-reason": "none",
    "firmware-upgrade-failure-reason": "none",
    "num-of-upses": 0,
    "num-of-major-alerts": 0,
    "naa-sys-id": "44969425303",
    "wr-iops-4kb": "0",
    "wr-iops-64kb": "0",
    "unaligned-iops": "0",
    "unaligned-bw": "0",
    "encryption-supported": true,
    "small-rd-bw": "0",
    "replication-efficiency-ratio": 1.0,
    "vol-size": "16052166656",
    "unaligned-wr-bw": "0",
    "rd-iops-512kb": "0",
    "thin-provisioning-savings": 100,
    "ib-switch-list": [],
    "wr-bw-4kb": "0",
    "wr-iops-8kb": "0",
    "dedup-space-in-use": "7776336",
    "num-of-bricks": 1,
    "rd-latency": "0",
    "avg-latency-32kb": "0",
    "max-num-of-ssds-per-rg": 38,
    "wr-latency-32kb": "0",
    "iops-by-block": "0",
    "wr-latency-8kb": "0",
    "sys-state": "active",
    "wr-iops-16kb": "0",
    "avg-latency-16kb": "0",
    "consistency-state": "healthy",
    "num-of-critical-alerts": 0,
    "rd-iops-2kb": "0",
    "wr-latency-1kb": "0",
    "rd-iops": "0",
    "max-vol-per-cg": 256,
    "small-bw": "0"
  },
  "links": [
    {
      "guid": "4b7891fe67be4c00b7c9c194c54150eb",
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/clusters/4b7891fe67be4c00b7c9c194c54150eb",
      "rel": "self"
    }
  ]
}

```

Modifying a Managed Cluster's Parameters

PUT /api/json/v3/types/clusters<parameter (cluster-guid or cluster-index or ?name=cluster-name)>

This command (PUT /api/json/v3/types/clusters/<parameter [cluster-guid or cluster-index or ?name=cluster-name]>) enables you to modify the parameters of a managed cluster, including performance data collection.

Note: To modify performance data collection for Volumes, see [Modifying the Performance Data Collection Mode for Volumes](#) on page 635.

Note: For multiple cluster configurations, using a cluster index or name instead of an object GUID identifier is still supported. However, the object GUID identifier is highly recommended, because it is unique in-cluster and between clusters.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
cluster-guid	A unique identifier for the cluster.	Select one of the following: - cluster-guid - cluster-index - cluster name
cluster-index	The index of the cluster.	
cluster-name	The name of the cluster.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
debug_create_timeout	Indicates whether XMS uses long or normal timeout for create-debug-info command. Values: - normal - long	Select one or more of the following: - debug_create_timeout - esx_device_connectivity_mode - iscsi_tcp_port - obfuscate_debug - odx_mode - replication_tcp
esx_device_connectivity_mode	Indicates the SCSI behavior towards Initiators with OS type of ESX, during system stop. Values: - PDL – Permanent Device Loss (indicates the loss of the datastore may be permanent) - APD – All Path Down (indicates the loss of the datastore may be temporary)	

Clusters

Input Parameter	Description	Mandatory
iscsi_tcp_port	The listen port for iSCSI. It is configured globally and used to set all portals ip-port property. The default value is 3260.	_port
obfuscate_debug	Indicates whether debug information is created while obfuscating IP addresses. Values: - enabled - disabled	
odx_mode	Indicates whether the cluster supports Microsoft's Offloaded Data Transfer (ODX). Values: - enabled - disabled	
replication_tcp_port	The TCP port used for native replication. The default port number is 1758.	
entity	If the performance-data-collection parameter is specified as enabled, then the entity must be provided. The values must be Volume.	- Yes – if performance_data_collection is enabled - No – if performance_data_collection is disabled
installation_type	Indicates whether the cluster installation was in a standard manner or RPQ was made (e.g., dispersed cluster or copper cables). Values: - standard_installation - rpq	No
installation_type_details	Installation details.	No
performance_data_collection	Indicates whether the performance data collection can be modified for the entity specified in the entity parameter. Values: - enabled - disabled Note: If enabled, then the entity parameter must be specified with the value Volume.	No

Input Parameter	Description	Mandatory
send_snmp_heartbeat	Indicates whether to disable SNMP heartbeat by XMS for this cluster. The SNMP heartbeat is sent only if the heartbeat is configured in the SNMP notifier on XMS. Values: - true - false	No
sys_id	The name or index of the cluster.	No

Example Request

```
PUT /api/json/v3/types/clusters/4b7891fe67be4c00b7c9c194c54150eb HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"performance-data-collection":"enabled","entity":"Volume"}
```

Response

Note: The successful completion of this command returns no response.

Consistency Groups

Viewing the List of Consistency Groups

GET /api/json/v3/types/consistency-groups

This command (GET /api/json/v3/types/consistency-groups) displays the list of Consistency Groups.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	The index or name of the cluster whose Consistency Groups will be listed.	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example Request

```
GET /api/json/v3/types/consistency-groups HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "consistency-groups": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/consistency-
groups/7a971fb97fad4aafa2487d8f7d226499",
      "name": "DBC61",
      "sys-name": "xbrickdrm1652"
    },
    ...
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/consistency-
groups/2bfcd9dafcde459ea0ad63edf2146baa",
      "name": "DBC61-DEV",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/consistency-
groups/6c3b4bc3f0c744c5a1897876b96a653d",
      "name": "CG-TW-01-3000",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/consistency-
groups/",
      "rel": "self"
    }
  ]
}
```

Consistency Groups

Viewing the Details of a Consistency Group

GET /api/json/v3/types/consistency-groups/<parameter (consistency-group-guid or consistency-group-index or ?name=consistency-group-name)>

This command (GET /api/json/v3/types/consistency-groups/<parameter [consistency-group-guid or consistency-group-index or ?name=consistency-group-name]>) displays the details of the selected Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
consistency-group-guid	A unique identifier for the Consistency Group.	Select one of the following: - consistency-group-guid - consistency-group-index - consistency-group-name
consistency-group-index	The index of the Consistency Group.	
consistency-group-name	The name of the Consistency Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Consistency Group.	- No – for single cluster configurations or if consistency-group-guid is specified - Yes – for multiple cluster configurations and if the consistency-group-guid is not specified

Consistency Groups

Output Parameter	Description
application-type	The host application type(s) for the Volumes in the Consistency Group, where the application-type of each Volume is specified by the user. If all of the Volumes in the Consistency Group have the same application-type, the Consistency Group's application-type is that type. If the Volumes have different application-types, the Consistency Group's application-type is a list of concatenated, comma separated application-types for all Volumes in the Consistency Group. Values: • epic - Epic • hyper_v_vm – Hyper-V VM • oracle_db – Oracle DB • other - other • other_db – other DB • sap - SAP • sql_server – SQL Server • vdi - VDI • vmware_vm - VMware
certainty	XMS certainty. Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
cg-id	For this Consistency Group, a tuple array containing the following parameters (in the following order): the Consistency Group object GUID identifier, the Consistency Group name, and the Consistency Group index.
cg-short-id	Short Consistency Group ID, created by SYM not used by the XMS, used by external interfaces (such as RecoverPoint)
created-by-app	Denotes the application which created the object.
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may including the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume in the Consistency-Group.
creation-time	The Consistency Group's creation timestamp (UTC).
guid	A unique identifier for the Consistency Group.
index	Consistency Group's index number as defined by the XMS upon its creation (a unique positive number)
last-refreshed-from-obj-index	The index of the object used to refresh this Consistency Group, using any type of snap-and-reassign operation.

Consistency Groups

Output Parameter	Description
last-refreshed-from-obj-name	The name of the object used to refresh this Consistency Group, using any type of snap-and-reassign operation.
last-refresh-from-obj-id	The Id of the object used to refresh this Volume, using any type of snap-and-reassign operation (for X2 clusters only)
last-refresh-time	The time this Volume was last refreshed (for X2 clusters only)
linked-consistency-group	The GUID or Id of the 'root' Consistency Group from which a linked Consistency Group was created (for X2 clusters only)
linked-consistency-group-index	The index of the 'root' Consistency Group from which a linked Consistency Group was created (for X2 clusters only)
linked-consistency-group-name	The name of the 'root' Consistency Group from which a linked Consistency Group was created (for X2 clusters only)
name	Consistency Group's name as defined by the user upon creation
num-local-protections	The number of local-protection sessions assigned to this Consistency Group. This value is calculated by the XMS.
num-of-snap-sets	The number of SnapshotSets that belong to this Consistency Group.
num-of-vols	Number of provisioned Volumes in this Consistency Group
obj-severity	Consistency Group's severity, based on severity level of current Alerts (Alerts still uncleared) for this Consistency Group Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
qos-effective-bw	The effective bandwidth of the QoS Policy specified by qos-policy-id for this Consistency Group.

Consistency Groups

Output Parameter	Description
qos-effective-max-bw	The effective maximum bandwidth which depends upon the limit-type of the QoS Policy specified by qos-policy-id for this Consistency Group as follows: - fixed – if the limit-type is fixed, then the effective maximum bandwidth is the QoS Policy's max-bw (if max-bw is specified), or the QoS Policy's max-iops multiplied by the io-size (if max-iops is specified). - adaptive – if the limit-type is adaptive, then the effective maximum bandwidth is the total size of Volumes in this Consistency Group multiplied by the QoS Policy's io-size.
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Consistency Group: Values: - disabled – the QoS Policy is not enforced - enabled – the QoS Policy is enforced - monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected.
qos-exceeded-bw	The bandwidth of IOs exceeding the QoS Policy specified by qos-policy-id. If the qos-enabled-mode is enabled, then these IOs were rejected.
qos-exceeded-iops	The number of IOPS rejected for exceeding the QoS Policy specified by qos-policy-id
qos-implicit-obj-list	A list of objects associated with the QoS Policy specified by qos-policy-id and this Consistency Group.
qos-policy-id	For the QoS Policy associated with this Consistency Group, a tuple array containing the following parameters (in the following order): the QoS Policy object GUID identifier, the QoS Policy name, and the QoS Policy index.
sys-id	For the cluster to which this Consistency Group belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined. The index number of the cluster this Consistency Group belongs to. May be omitted if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. The name may be omitted if only one cluster is defined.
tag-list	List of Tags
vol-list	The list of Volume object IDs this Consistency Group belongs to

Consistency Groups

Example Request

```
GET /api/json/v3/types/consistency-groups/8c82265b3f394e55951f1b23f97b5cc1
HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "last-refreshed-from-obj-name": "",
    "wr-latency": "0",
    "obj-severity": "information",
    "linked-consistency-group": "7c2d52656e656e2048616c6c616b2d7c",
    "rd-bw": "0",
    "created-by-app": "xms",
    "sys-index": 1,
    "iops": "0",
    "guid": "8c82265b3f394e55951f1b23f97b5cc1",
    "qos-exceeded-iops": "0",
    "acc-num-of-rd": "0",
    "index": 20,
    "qos-enabled-mode": "enabled",
    "created-by-external-client": "",
    "acc-size-of-wr": "0",
    "name": "TW-CG-3000",
    "linked-consistency-group-index": "",
    "num-of-local-protections": 0,
    "creation-time": 1530462392598,
    "num-of-vols": 3,
    "num-of-snap-sets": 0,
    "qos-exceeded-bw": 0,
    "last-refresh-from-obj-id": "7c2d52656e656e2048616c6c616b2d7c",
    "tag-list": [],
    "last-refresh-time": "1530462392598",
    "bw": "0",
    "cg-id": [
      "8c82265b3f394e55951f1b23f97b5cc1",
      "TW-CG-3000",
      20
    ],
    "wr-iops": "0",
    "qos-implicit-obj-list": [],
    "vol-list": [
      [
        "3e3623f1f21e4c6a94891a5123329ee7",
        "TW-001-003",
        101
      ],
      [
        "61ef99db693a4d70b9ce639022662cb0",
        "TW-001-001",
        104
      ]
    ]
  }
}
```

```

    ],
    [
      "4862fe4bddd941f595a00652fb5244f4",
      "TW-001-002",
      114
    ]
  ],
  "sys-id": [
    "4b7891fe67be4c00b7c9c194c54150eb",
    "xbrickdrm1652",
    1
  ],
  "avg-latency": "0",
  "qos-policy-id": [
    "fad078ed1cdf4f64bf974141389b0c35",
    "QoS-Policy-001",
    14
  ],
  "last-refreshed-from-obj-index": "",
  "application-type": "",
  "rd-latency": "0",
  "certainty": "ok",
  "cg-short-id": 19,
  "acc-num-of-wr": "0",
  "acc-size-of-rd": "0",
  "linked-consistency-group-name": "",
  "qos-effective-burst-bw": 102,
  "qos-effective-max-bw": 1024,
  "rd-iops": "0",
  "wr-bw": "0",
  "sys-name": "xbrickdrm1652"
},
"links": [
  {
    "guid": "8c82265b3f394e55951f1b23f97b5cc1",
    "href": "https://vxms-xbrickdrm1652/api/json/v3/types/consistency-
groups/8c82265b3f394e55951f1b23f97b5cc1",
    "rel": "self"
  }
]
}

```

Consistency Groups

Creating a Consistency Group

POST /api/json/v3/types/consistency-groups

This command (POST /api/json/v3/types/consistency-groups) enables you to create a Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	The index or name of the cluster on which the new Consistency Group will be created.	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
consistency-group-name	The new Consistency Group's name.	Yes
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume in the Consistency-Group.	No
tag-list	The list of Tags, including full name/path, to be included in the Consistency Group	No
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Consistency Group: Values: - disabled – the QoS Policy is not enforced - enabled – the QoS Policy is enforced - monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected. The default value is enabled.	No

Consistency Groups

Input Parameter	Description	Mandatory
qos-policy-id	The Id of the QoS Policy object to associate with this Consistency Group.	No
vol-list	The list of unique identifiers of the Volumes to add to the new Consistency Group.	No

Example Request

POST /api/json/v3/types/consistency-groups HTTP/1.1
Host: vxms-xbrickdrm788.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"consistency-group-name":"TW-CG-3000", "qos-enabled-mode":"enabled", "qos-policy-id":["fad078ed1cdf4f64bf974141389b0c35"]}

Response

```
{
  "links": [
    {
      "guid": "8c82265b3f394e55951f1b23f97b5cc1",
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/consistency-groups/8c82265b3f394e55951f1b23f97b5cc1",
      "rel": "self"
    }
  ]
}
```

Consistency Groups

Creating a Repurpose Copy of a Consistency Group

PUT /api/json/v3/commands/consistency-groups/create-repurpose-copy

The command (PUT /api/json/v3/commands/consistency-groups/create-repurpose-copy) enables you to create a repurpose copy from a Consistency Group. For X1 hardware cluster types, this command creates Snapshot-Sets with regular Volumes. For X2 hardware cluster types, this command creates linked Consistency Groups with regular Volumes.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-consistency-group-id	The unique identifier of the Consistency Group to copy.	Yes
cluster-id	The index or name of the Cluster on which the source Consistency Group is located.	No
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume in the repurpose copy created from the Consistency-Group.	No
management-locked	This indicates whether the new Volume(s) created by this command will be defined as a management-locked Volume. Management-locked Volumes cannot be deleted and their data cannot be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked	No

Consistency Groups

Input Parameter	Description	Mandatory
new-consistency-group-name	The name of the new Consistency Group to create. The only valid characters are alphanumerics, spaces and the following characters ~!@#\$\$%^*_+{} :?.-	No
new-snapshot-set-name	The name of the new Snapshot-Set to create. The only valid characters are alphanumerics, spaces and the following characters ~!@#\$\$%^*_+{} :?.-	No
new-vol-suffix	The suffix to use for the new Consistency Group Volume.	No

Output Parameter	Description
volumes	A list of new Volumes created, including each Volume's href, index, guid, and name..
consistency-group	The Consistency Group properties, including href, index, guid, and name.

Example

```
PUT /api/json/v3/commands/consistency-groups/create-repurpose-copy HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-consistency-group-id":["6770e67f9b0d4f58ab66beb7960d9075"],"new-consistency-group-name":"TW-NEW-CG-01"}
```

Consistency Groups

Response

```
{
  "content": {
    "volumes": [
      {
        "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/volumes/8bbb2d93ce0a47169e5542c7b2e0cd77",
        "index": 105,
        "guid": "8bbb2d93ce0a47169e5542c7b2e0cd77",
        "name": "TW-Test-Vol-01.1528625423111"
      }
    ],
    "consistency-group": {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/consistency-
groups/8aefdc3c8ef425bb4b9def80c60d6f9",
      "index": 13,
      "guid": "8aefdc3c8ef425bb4b9def80c60d6f9",
      "name": "TW-NEW-CG-01"
    }
  },
  "links": [
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/commands/consistency-groups/create-repurpose-copy/",
      "rel": "self"
    }
  ]
}
```

Creating a Protection Copy of a Consistency Group

PUT /api/json/v3/commands/consistency-groups/create-protection-copy

This command (PUT /api/json/v3/commands/consistency-groups/create-protection-copy) enables you to create a read-only Snapshot of an existing Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-consistency-group-id	The unique identifier of the Consistency Group to copy.	Yes
cluster-id	The index or name of the Cluster on which the source Consistency Group is located.	No
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume in the protection copy created from the Consistency-Group.	No
management-locked	This indicates whether the new Volume(s) created by this command will be defined as a management-locked Volume. Management-locked Volumes cannot be deleted and their data cannot be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked	No
new-snapshot-set-name	The new name of the new Snapshot Set.	No

Consistency Groups

Input Parameter	Description	Mandatory
new-vol-suffix	The suffix of the newly created Snapshot-Set. If a suffix is not provided, then the existing Volume name will be used and the suffix will be an Epoch format timestamp (seconds since 1/1/1970). A timestamp is used because unnamed Snapshot Sets are not be supported,	No

Example Request

PUT /api/json/v3/commands/consistency-groups/create-protection-copy HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"from-consistency-group-id":["6770e67f9b0d4f58ab66beb7960d9075"]}

Response

```
{
  "content": {
    "volumes": [
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/7f60cf71c19a4982ae8ed1da3bc4cf1b",
        "index": 106,
        "guid": "7f60cf71c19a4982ae8ed1da3bc4cf1b",
        "name": "TW-Test-Vol-01.1528625548614"
      }
    ],
    "snapshot-set": {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/f1fd0879c36f48a88865da18f7f76836",
      "index": 31,
      "guid": "f1fd0879c36f48a88865da18f7f76836",
      "name": "SnapshotSet.1528625548614"
    }
  },
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/commands/consistency-groups/create-protection-copy/",
      "rel": "self"
    }
  ]
}
```

Adding a Volume to Consistency Group

PUT /api/json/v3/commands/consistency-groups/add-volume

The command (PUT /api/json/v3/commands/consistency-groups/add-volume) enables you to add a Volume to a Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cg-id	The unique identifier of the Consistency Group to which to add the Volume.	Yes
vol-id	The unique identifier of the Volume to add.	Yes
cluster-id	The index or name of the cluster on which the Consistency Group is located.	No
reference-volume-id	If the Volume to add must be added in a specific location in a Consistency Group, this is The unique identifier of an existing Volume in the Consistency Group whose position will become the position of the newly added Volume.	No

Example

```
PUT /api/json/v3/commands/consistency-groups/add-volume HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"cg-id":["0b4efb8333f944b7800b5b34d6b5df1f"],"vol-id":["61ef99db693a4d70b9ce639022662cb0"]}
```

Response

Note: The successful completion of this command returns no response.

Consistency Groups

Adding a Copy Volume to Linked Consistency Groups

PUT /api/json/v3/commands/consistency-groups/add-copy-volume-to-consistency-groups

The command (PUT /api/json/v3/commands/consistency-groups/add-copy-volume-to-consistency-groups) enables you to copy Consistency Groups from Volumes to a Linked Consistency Groups to align Volumes between Linked Consistency Groups.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cg-list	The list of Consistency Groups to which the Volume(s) are added.	Yes
reference-cg	The unique identifier of the Consistency Group that contains the new Volume from which the new copies will be created.	Yes
reference-volume	The unique identifier of the Volume in the Consistency Group from which the new copies will be created.	Yes
volume-name-suffix-list	The list of new Volume name suffixes. These suffixes are applied in the same order as the Consistency Groups in the cg-list parameter.	Yes
cluster-id	The name or index of the Cluster on which the Consistency Group is located.	No

Example

```
PUT /api/json/v3/commands/consistency-groups/add-copy-volume-to-consistency-groups HTTP/1.1
```

```
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
```

```
Authorization: Basic *****
```

```
Cache-Control: no-cache
```

```
{"reference-cg":9, "reference-volume":41,"cg-list":[10,11], "volume-name-suffix-list":["DEV","DEV1"]}
```

Response

Note: The successful completion of this command returns no response.

Refreshing a Linked Consistency Group

Note: Supported for X2 hardware cluster types only.

PUT /api/json/v3/commands/consistency-groups/refresh-data

The command (PUT /api/json/v3/commands/consistency-groups/refresh-data) enables you to refresh data from a Snapshot Set to Consistency Group, and from a Consistency Group to Consistency Group.

Note: Creating a repurpose copy from an SnapshotSet level if the SnapshotSet originated from a Volume / Volume list is a restricted option, because the Volume / Volume list is not grouped. The completion code for this restricted option is, "ss_parent_cg_is_not_valid".

Note: Misaligned Volumes cannot be refreshed without the "ignore-empty-pair" parameter. The completion code for attempting to refresh a misaligned Volume without the "ignore-empty-pair" parameter is, "restricted_fail_positon_failed".

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-consistency-group-id	The unique identifier of the source Consistency Group.	Select one of the following: - from-consistency-group-id - from-snapshot-set-id
from-snapshot-set-id	The unique identifier of the source Snapshot-Set.	
to-consistency-group-id	The unique identifier of the target Consistency Group.	Yes
backup-snap-suffix	The suffix added to the backup Snapshot-Set.	No
cluster-id	The name or index of the Cluster on which the source Snapshot-Set or Consistency Group is located.	No

Consistency Groups

Input Parameter	Description	Mandatory
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume in the linked Consistency-Group.	No
dry-run	The option to perform the refresh as a dry-run. A dry-run does not perform the refresh, however the response returns the link information as if a refresh were performed. Any value triggers a dry run.	No
ignore-empty-pair	Indicates whether this operation succeeds or fails if one or more Volumes are missing on either the source or target of the refresh. Values: <code>true</code> – the operation succeeds if one or more Volumes are missing <code>false</code> – the operation fails if one or more Volumes are missing	No
no-backup	Indicates whether to keep a backup of the Snapshot-Set. Values: <code>true</code> – keep a backup <code>false</code> – do not keep a backup If not specified, the default value is <code>true</code> .	No

Example Request

```
PUT /api/json/v3/commands/consistency-groups/refresh-data HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"from-consistency-group-id":["eaf217691eca4faca5a948a2115b65b6"], "to-
consistency-group-id":["6770e67f9b0d4f58ab66beb7960d9075"]}
```

Response

Note: The successful completion of this command returns no response.

Refreshing a Linked Consistency Group – Dry Run

Note: Supported for X2 hardware cluster types only.

PUT /api/json/v3/commands/consistency-groups/refresh-data

The command (PUT /api/json/v3/commands/consistency-groups/refresh-data) enables you to view the Volume relationships for which the refresh operation can execute.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-consistency-group-id	The unique identifier of the source Consistency Group.	Select one of the following: - from-consistency-group-id - from-snapshot-set-id
from-snapshot-set-id	The name or index of the source Snapshot-Set from which to refresh data.	
dry-run	The option to perform the refresh as a dry-run. A dry-run does not perform the refresh, however the response returns the link information as if a refresh were performed. Any value triggers a dry run. Note: To refresh a Linked Consistency Group as a Dry Run to view the Volume relationships, the dry-run parameter value must be specified with any value.	Yes

Consistency Groups

Input Parameter	Description	Mandatory
to-consistency-group-id	The name or index of the target Consistency Group to which to refresh data.	Yes
backup-snap-suffix	The suffix added to the backup Snapshot-Set.	No
cluster-id	The name or index of the Cluster on which the Snapshot-Set or source Consistency Group is located.	No
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume in the linked Consistency-Group.	No
ignore-empty-pair	Indicates whether this operation succeeds or fails if one or more Volumes are missing on either the source or target of the refresh. Values: - true – the operation succeeds if one or more Volumes are missing - false – the operation fails if one or more Volumes are missing	No
no-backup	Indicates whether to keep a backup of the Snapshot-Set. Values: - true – keep a backup - false – do not keep a backup If not specified, the default value is true.	No

Example Request

```
PUT /api/json/v3/commands/consistency-groups/refresh-data HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-consistency-group-id":["eaf217691eca4faca5a948a2115b65b6"],"to-consistency-group-id":["6770e67f9b0d4f58ab66beb7960d9075"],"dry-run":"true"}
```

Response

Note: A dry run response contains a comparison of the Consistency Group and the Linked Consistency Group.

Note: Creating a repurpose copy from an SnapshotSet level if the SnapshotSet originated from a Volume / Volume list is a restricted option, because the Volume / Volume list is not grouped. The completion code for this restricted option is, "ss_parent_cg_is_not_valid".

Note: Misaligned Volumes cannot be refreshed without the "ignore-empty-pair" parameter. The completion code for attempting to refresh a misaligned Volume without the "ignore-empty-pair" parameter is, "restricted_fail_positon_failed".

Consistency Groups

Refreshing a Linked Consistency Group - Ignoring Misaligned Volume Positions

Note: Supported for X2 hardware cluster types only.

PUT /api/json/v3/commands/consistency-groups/refresh-data

The command (PUT /api/json/v3/commands/consistency-groups/refresh-data) enables you to refresh data from a Snapshot Set to a Consistency Group, and from Consistency Group to Consistency Group ignoring misaligned Volume positions.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-consistency-group-id	The unique identifier of the source Consistency Group.	Select one of the following: - from-consistency-group-id - from-snapshot-set-id
from-snapshot-set-id	The name or index of the source Snapshot-Set from which to refresh data.	
to-consistency-group-id	The unique identifier of the target Consistency Group	Yes
ignore-empty-pair	Indicates whether this operation succeeds or fails if one or more Volumes are missing on either the source or target of the refresh. Values: - true – the operation succeeds if one or more Volumes are missing - false – the operation fails if one or more Volumes are missing Note: To refresh a Linked Consistency Group ignoring misaligned Volumes, the ignore-empty-pair parameter value must be true.	Yes
backup-snap-suffix	The suffix added to the backup Snapshot-Set.	No
cluster-id	The name or index of the Cluster on which the Snapshot-Set or source Consistency Group is located.	No

Consistency Groups

Input Parameter	Description	Mandatory
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may including the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume in the linked Consistency-Group.	No
dry-run	The option to perform the refresh as a dry-run. A dry-run does not perform the refresh, however the response returns the link information as if a refresh were performed. Any value triggers a dry run.	No
no-backup	Indicates whether to keep a backup of the Snapshot-Set. Values: - true – keep a backup - false – do not keep a backup If not specified, the default value is true.	No

Example Request

```
PUT /api/json/v3/commands/consistency-groups/refresh-data HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-consistency-group-id":["eaf217691eca4faca5a948a2115b65b6"],"to-consistency-group-id":["6770e67f9b0d4f58ab66beb7960d9075"],"ignore-empty-pair":"true"}
```

Consistency Groups

Response

Note: The successful completion of this command returns no response.

Note: Creating a repurpose copy from an SnapshotSet level if the SnapshotSet originated from a Volume / Volume list is a restricted option, because the Volume / Volume list is not grouped. The completion code for this restricted option is, "ss_parent_cg_is_not_valid".

Note: Misaligned Volumes cannot be refreshed without the "ignore-empty-pair" parameter. The completion code for attempting to refresh a misaligned Volume without the "ignore-empty-pair" parameter is, "restricted_fail_positon_failed".

Restoring Data to a Consistency Group

Note: Supported for X2 hardware cluster types only.

PUT /api/json/v3/commands/consistency-group/restore-data

The command (PUT /api/json/v3/commands/consistency-group/restore-data) enables you to restore data from a SnapshotSet to a Consistency Group, and from a Consistency Group to a Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-snapshotset-id	The name or index of the source Snapshot-Set from which to restore data.	Yes
to-consistency-group-id	The unique identifier of the target Consistency Group	Yes
backup-snap-suffix	The backup Volumes suffix to be created automatically if the no-backup parameter is specified as false. (no-backup specified as false means a backup is created).	No
cluster-id	The name or index of the Cluster on which the Snapshot-Set or source Consistency Group is located.	No
dry-run	The option to perform the refresh as a dry-run. A dry-run does not perform the refresh, however the response returns the link information if a refresh were performed. Any value triggers a dry run.	No
ignore-empty-pair	Indicates whether to return this operation was successful if one or more Volumes are missing on either the from or to side of the refresh. Values: - true – return success if one or more Volumes are missing - false – return fail if one or more Volumes are missing	No
no-backup	Indicates whether a backup is created. Values: - true – do not create a backup - false – create a backup	No

Consistency Groups

snapshot-set-name	The backup Snapshot-Set name to be created automatically, if the no-backup paramater is specified as false. (no-backup specified as false means a backup is created).	No

Example Request

```
PUT /api/json/v3/commands/consistency-groups/restore-data HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"from-snapshot-set-id":["9975a0f0632b46568eb33eebd92e7c0c"],"to-consistency-group-id":["25f98875678b464c93ea85463314c6b2"]}
```

Response

Note: The successful completion of this command returns no response.

Modifying a Consistency Group's Volumes

PUT /api/json/v3/types/consistency-groups/<parameter (consistency-group-guid or consistency-group-index or ?name=consistency-group-name)>

This command (PUT /api/json/v3/types/consistency-groups/<parameter [consistency-group-guid or consistency-group-index or ?name=consistency-group-name]>) enables you to modify all Volumes in a Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
consistency-group-guid	A unique identifier for the Consistency Group.	Select one of the following: - consistency-group-guid - consistency-group-index - consistency-group-name
consistency-group-index	The index of the Consistency Group.	
consistency-group-name	The name of the Consistency Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Consistency Group.	- No – for single cluster configurations or if consistency-group-guid is specified - Yes – for multiple cluster configurations and if the consistency-group-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory

Consistency Groups

Input Parameter	Description	Mandatory
management-locked	This indicates whether Volume(s) modified by this command can be deleted or their data can be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked	No
vol-access	A Volume is created with write access rights. Volumes can be modified after being created and have their access levels' changed. Volumes can have one of the following access write levels: - no_access - All SCSI commands for accessing data on the Volume (read commands and write commands) fail, and all SCSI discovery commands (i.e. inquiries on Volume characteristics and not accessing the data on the Volume) succeed. - read_access - All SCSI write commands fail and all SCSI read commands and discovery commands succeed. - write_access - All commands succeed and the host can write to the Volume.	No

Example Request

```
PUT /api/json/v3/types/consistency-groups HTTP/1.1
Host: vxms-xbrickdrm788.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"management-locked ":"enabled"}
```

Response

Note: The successful completion of this command returns no response.

Renaming a Consistency Group

PUT /api/json/v3/types/consistency-groups/<parameter (consistency-group-guid or consistency-group-index or ?name=consistency-group-name)>

This command (PUT /api/json/v3/types/consistency-groups/<parameter [consistency-group-guid or consistency-group-index or ?name=consistency-group-name]>) enables you to rename a Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
consistency-group-guid	A unique identifier for the Consistency Group.	Select one of the following: - consistency-group-guid - consistency-group-index - consistency-group-name
consistency-group-index	The index of the Consistency Group.	
consistency-group-name	The name of the Consistency Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Consistency Group.	- No – for single cluster configurations or if consistency-group-guid is specified - Yes – for multiple cluster configurations and if the consistency-group-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
new-name	Consistency Group's new name	Yes

Consistency Groups

Example Request

```
PUT /api/json/v3/types/consistency-groups/6c0c3205a72341b5a16e6a930ea3435e
HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"new-name": "TEST"}
```

Response

Note: The successful completion of this command returns no response.

Modifying a Consistency Group's Quality of Service Policy

PUT /api/json/v3/types/consistency-groups<parameter (consistency-group-guid or consistency-group-index or ?name=consistency-group-name)>

This command (PUT /api/json/v3/types/consistency-groups<parameter [consistency-group-guid or consistency-group-index or ?name=consistency-group-name]>) enables you to rename a Consistency Group, and modify or remove a Consistency Group's Quality of Service (QoS) Policy.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
consistency-group-guid	A unique identifier for the Consistency Group.	Select one of the following: - consistency-group-guid - consistency-group-index - consistency-group-name
consistency-group-index	The index of the Consistency Group.	
consistency-group-name	The name of the Consistency Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Consistency Group.	- No – for single cluster configurations or if consistency-group-guid is specified - Yes – for multiple cluster configurations and if the consistency-group-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory

Consistency Groups

qos-policy-id	The Id of the QoS Policy object to associate with this Consistency Group. Note: If qos-policy-id is specified, remove-qos-policy cannot be specified.	Select at least one of the following: - qos-policy-id - qos-enabled-mode - remove-qos-policy But not both of the following: - qos-policy-id - remove-qos-policy
remove-qos-policy	Indicates whether to remove the associated QoS Policy. Note: If remove-qos-policy is specified, qos-policy-id cannot be specified.	
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Consistency Group: Values: - disabled – the QoS Policy is not enforced - enabled – the QoS Policy is enforced - monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected. The default value is enabled.	

Example Request

PUT /api/json/v3/types/consistency-groups/6c0c3205a72341b5a16e6a930ea3435e HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"qos-policy-id":1,"qos-enabled-mode":"enabled"}

Response

Note: The successful completion of this command returns no response.

Removing a Volume from a Consistency Group

Note: Supported for X2 hardware cluster types only.

PUT /api/json/v3/commands/consistency-groups/remove-volume

The command (PUT /api/json/v3/commands/consistency-groups/remove-volume) enables you to remove a Volume from a Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cg-id	The unique identifier of the Consistency Group from which to remove the Volume.	Yes
vol-d	The unique identifier of the Volume in the Consistency Group to remove.	Yes
cluster-id	The name or index of the Cluster to which the Consistency Group with the Volume to remove belongs.	No

Example

```
PUT /api/json/v3/commands/consistency-groups/remove-volume HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"cg-id":["eaf217691eca4faca5a948a2115b65b6"],"vol-id":["6770e67f9b0d4f58ab66beb7960d9075"]}
```

Response

Note: The successful completion of this command returns no response.

Removing a Consistency Group

DELETE /api/json/v3/types/consistency-groups/<parameter (consistency-group-guid or consistency-group-index or ?name=consistency-group-name)>

This command (DELETE /api/json/v3/types/consistency-groups/consistency-groups/<parameter [consistency-group-guid or consistency-group-index or

Consistency Groups

?name=consistency-group-name]>) enables you to remove a Consistency Group. For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
consistency-group-guid	A unique identifier for the Consistency Group.	Select one of the following: - consistency-group-guid - consistency-group-index - consistency-group-name
consistency-group-index	The index of the Consistency Group.	
consistency-group-name	The name of the Consistency Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Consistency Group.	- No – for single cluster configurations or if consistency-group-guid is specified - Yes – for multiple cluster configurations and if the consistency-group-guid is not specified

Note: A cluster can also be defined as `cluster-id` in the body, however the cluster definition should only be entered in one location, either the URL or the body.

Example Request

```
DELETE /api/json/v3/types/consistency-groups/6c0c3205a72341b5a16e6a930ea3435e
HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Consistency Group Copies

Viewing the List of Protection Copies of a Consistency Group

GET /api/json/v3/types/consistency-group-copies/<parameter (consistency-group-guid or consistency-group-id or ?name=consistency-group-name)>

This command (GET /api/json/v3/types/consistency-group-copies/<parameter [consistency-group-guid or consistency-group-id or ?name=consistency-group-name]>) displays the list of all Snapshot Set copies of a specified Consistency Group.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
consistency-group-guid	A unique identifier for the Consistency Group.	Select one of the following: - consistency-group-guid - consistency-group-id - consistency-group-name
consistency-group-id	The index of the Consistency Group.	
consistency-group-name	The name of the Consistency Group.	
protection-only	Allows selecting only read-only copies directly created from the selected source Consistency Group Values: - False – disable - True – enable	No

Consistency Group Copies

Input Parameter	Description	Mandatory
- cluster-index OR - cluster-name	The Cluster index or name of the Consistency Group.	- No – for single cluster configurations or if consistency-group-guid is specified - Yes – for multiple cluster configurations and if the consistency-group-guid is not specified

Example request

GET /api/json/v3/types/consistency-group-copies/c7d9a873085f41e99441a3dbbebea20f HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/consistency-
group-copies/",
      "rel": "self"
    }
  ],
  "snapshot-sets": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/snapshot-
sets/84bbaa034eac4d63b2f4ac69c3bb8c8e",
      "name": "SnapShotSet.1527751978781"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/snapshot-
sets/823826380bcc4d5b8a64a7a6f5837beb",
      "name": "SnapShotSet.1527752174411"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/snapshot-
sets/dc21500658174e9d8581573369ff574c",
      "name": "SnapShotSet.1527752204810"
    }
  ]
}
```

DAEs

DAEs

Viewing the List of DAEs

GET /api/json/v3/types/daes

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	For a single cluster configuration: - No For a multiple cluster configuration: - No – to list all DAEs for all clusters - Yes – to list only DAEs for a specific cluster

Example Request

GET /api/json/v3/types/daes HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "daes": [
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/daes/36fd5a8c537d4fd78803b3443cf1e0a8",
      "name": "X1-DAE",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/daes/c4195e1b7dd04abb9c37816cf564ac65",
      "name": "X1-DAE",
      "sys-name": "xbrick224-rename"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/daes/",
      "rel": "self"
    }
  ]
}
```

DAEs

Viewing the Details of a DAE

GET /api/json/v3/types/daes/<parameter (dae-guid or dae-index or ?name=dae-name)>

This command (GET /api/json/v3/types/daes/<parameter [dae-guid or dae-index or ?name=dae-name]>) displays the details of the selected DAE.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
dae-guid	A unique identifier for the DAE.	Select one of the following: • dae-guid • dae-index • dae-name
dae-index	The index of the DAE.	
dae-name	The name of the DAE.	
• cluster-index - OR • cluster-name	The Cluster index or name of the DAE.	• No – for single cluster configurations or if dae-guid is specified • Yes – for multiple cluster configurations and if the dae-guid is not specified

Output Parameter	Description
brick-id	For the X-Brick to which this DAE belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
fan-1-rpm	The speed of fan number 1. This is the outer fan of module 1 (for X2 clusters only)
fan-2-rpm	The speed of fan number 2. This is the outer fan of module 2 (for X2 clusters only)

Output Parameter	Description
fan-3-rpm	The speed of fan number 3. This is the outer fan of module 3 (for X2 clusters only)
fan-4-rpm	The speed of fan number 4. This is the outer fan of module 4 (for X2 clusters only)
fan-pair1-status	The status of fan pair 1. The fan drawer is comprised of 2 fans (for X2 clusters only)
fan-pair2-status	The status of fan pair 2. The fan drawer is comprised of 2 fans (for X2 clusters only)
fan-pair3-status	The status of fan pair 3. The fan drawer is comprised of 2 fans (for X2 clusters only)
fan-pair4-status	The status of fan pair 4. The fan drawer is comprised of 2 fans (for X2 clusters only)
fru-lifecycle-state	DAE's FRU state, using the generic FRU transition states Values: • healthy - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • failed - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • disconnected - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • uninitialized - An FRU that has not been initialized passes through this state before initialization. • initializing - Indicates a transient state in which the system performs initialization of a component.
fru-replace-failure-reason	Reason why the FRU replacement has failed. null means that the last FRU replacement was either not performed for this object or the replacement was successful.
fw-version	Current firmware version of the DAE
guid	A unique identifier for the DAE.
hw-revision	Hardware revision • Hardware level of the power supply unit. • The value is not always available. • GUI and CLI do not display the value when unavailable.

DAEs

Output Parameter	Description
identify-led	Indicates whether the identification LED is illuminated for this DAE. The property value is reflected in the GUI LED icon. Note: There is no identification LED in the current PSU. Values: - off - Identification LED is turned off. - blinking - Identification LED is blinking. - on - Identification LED is turned on. - na - This LED or reading of its value is not supported in the hardware.
index	DAE's index number as defined by the XMS upon its creation (a unique positive number)
jbod-id	For the JBOD to which this DAE belongs, a tuple array containing the following parameters (in the following order): the DAE object GUID identifier, the DAE name, and the DAE index.
jbod-index	The Index of the DAE.
jbod-name	The DAE name.
model-name	Vendor-assigned DAE model name
name	DAE's name
num-of-jbod-controllers	The number of controller objects that belong to this DAE and a list of their object IDs
num-of-jbod-psus	The number of PSU objects that belong to this DAE and a list of their object IDs
obj-severity	DAE severity, based on severity level of current Alerts (Alerts still uncleared) for this DAE and its contained objects Values: - clear - No Alerts exist for this entity. - information - The highest severity for this entity and all contained objects is information. - minor - The highest severity for this entity and all contained objects is minor. - major - The highest severity for this entity and all contained objects is major. - critical - The highest severity for this entity and all contained objects is critical.
part-number	Part number. Dell EMC-assigned string identifying part (SKU). Independent of the actual vendor model_name used for this FRU
serial-number	DAE's serial number
status-led	Status LED state, indicating DAE object faults

Output Parameter	Description
sys-id	For the cluster to which this DAE belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags
temperature-state	This Indicates whether any of the DAE sub components, such as SSD, DAE-Controller, or DAE-Row-Controller, have a temperature above normal. Critical/high/invalid temperature states may trigger HA events, such as SAS-path failover or stop-cluster. This relies on the most significant temperature-state of the DAE's sub components.
voltage-line	Indicates the voltage line type. Values: • high-line –220V • low-line –110V
voltage-over-populated	Indicates whether the system is considered over-populated with respect to voltage. This relevant for 110V (low line) systems. Values: • True – the system is over- populated with respect to voltage • False – the system is not over-populated with respect to voltage
xms-id	For the XMS to which this DAE belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

DAEs

Example Request

```
GET /api/json/v3/types/daes/b670c9fb3d9140c1bd3bbabb9994d93b HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "fru-lifecycle-state": "healthy",
    "fan-pair4-status": "healthy",
    "obj-severity": "information",
    "voltage-over-populated": "false",
    "num-of-jbod-psus": 2,
    "sys-index": 1,
    "serial-number": "QTF0016290038",
    "fan-pair2-status": "healthy",
    "fan-pair2-hardware-label": "Fan1",
    "jbod-index": 1,
    "fru-replace-failure-reason": "",
    "guid": "b670c9fb3d9140c1bd3bbabb9994d93b",
    "index": 1,
    "fan-1-rpm": 8160,
    "fan-8-rpm": 7980,
    "jbod-name": "X1-DAE",
    "num-of-jbod-controllers": 2,
    "voltage-line": "high_line",
    "fan-2-rpm": 7640,
    "fan-5-rpm": 8050,
    "brick-name": "X1",
    "hw-revision": "F3D",
    "jbod-id": [
      "b670c9fb3d9140c1bd3bbabb9994d93b",
      "X1-DAE",
      1
    ],
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "fan-4-rpm": 7800,
    "fan-pair1-hardware-label": "Fan0",
    "tag-list": [],
    "identify-led": "off",
    "fw-version": "",
    "fan-pair3-hardware-label": "Fan2",
    "fan-7-rpm": 8540,
    "part-number": "105-000-682-03",
    "brick-index": 1,
    "fan-pair4-hardware-label": "Fan3",
    "sys-id": [
      "7e0bbd4b7d69477ab32e2953636a70de",

```

```

        "xbrickdrm919",
        1
    ],
    "fan-pair1-status": "healthy",
    "name": "X1-DAE",
    "brick-id": [
        "bb1a71566d7e4756a4e902bc7a029e57",
        "X1",
        1
    ],
    "fan-6-rpm": 7560,
    "status-led": "na",
    "fan-3-rpm": 8340,
    "fan-pair3-status": "healthy",
    "model-name": "Quanta",
    "sys-name": "xbrickdrm919"
},
"links": [
    {
        "guid": "b670c9fb3d9140c1bd3bbabb9994d93b",
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/daes/b670c9fb3d9140c1bd3bbabb9994d93b",
        "rel": "self"
    }
]
}

```

DAE Controllers

DAE Controllers

Viewing the List of DAE Controllers

GET /api/json/v3/types/dae-controllers

This command (GET /api/json/v3/types/dae-controllers) displays the list of DAE Controllers.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	For a single cluster configuration: - No For a multiple cluster configuration: - No – to list all DAE Controllers for all clusters - Yes – to list only DAE Controllers for a specific cluster

Example Request

```
GET /api/json/v3/types/dae-controllers HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "dae-controllers": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-controllers/a2266e94d5bf49d49744eaec95826f13",
      "name": "X1-DAE-LCC-B",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-controllers/219cc0c9d32d45d1a90031e4da91178e",
      "name": "X1-DAE-Controller-L",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-controllers/c70bcd402394da3b63331b496684487",
      "name": "X1-DAE-LCC-A",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-controllers/6385fe055fb84d3680e40587454a81e8",
      "name": "X1-DAE-Controller-R",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-controllers/",
      "rel": "self"
    }
  ]
}
```

DAE Controllers

Viewing the Details of a DAE Controller

GET /api/json/v3/types/dae-controllers/<parameter (dae-controller-guid or dae-controller-index or ?name=dae-controller-name)>

This command (GET /api/json/v3/types/dae-controllers/<parameter [dae-controller-guid or dae-controller-index or ?name=dae-controller-name]>) displays the details of the selected DAE Controller.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
dae-controller-guid	A unique identifier for the DAE Controller	Select one of the following: - dae-controller-guid - dae-controller-index - dae-controller-name
dae-controller-index	The index of the DAE Controller.	
dae-controller-name	The name of the DAE Controller.	
- cluster-index - OR - cluster-name	The Cluster index or name of the DAE Controller.	- No – for single cluster configurations or if dae-controller-guid is specified - Yes – for multiple cluster configurations and if the dae-controller-guid is not specified

Note: Using the dae-controller-guid is recommended, because it eliminates the requirement for cluster-id in multiple cluster configurations.

Output Parameter	Description
brick-id	For the X-Brick to which this DAE Controller belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.

DAE Controllers

Output Parameter	Description
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
enabled-state	Indicates whether DAE Controller is currently enabled or disabled, either by the user or the cluster.
failure-reason	The reason why the FRU is diagnosed as failed
fru-lifecycle-state	DAE Controller's FRU state, using the generic FRU transition states Values: • <code>healthy</code> - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • <code>failed</code> - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • <code>disconnected</code> - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • <code>uninitialized</code> - An FRU that has not been initialized passes through this state before initialization. • <code>initializing</code> - Indicates a transient state in which the system performs initialization of a component.
fru-replace-failure-reason	Reason why the FRU replacement has failed. <code>null</code> means that the last FRU replacement was either not performed for this object or the replacement was successful.
fw-version	Current firmware version of the DAE Controller
fw-version-error	Indicate if the firmware or OS upgrade has failed or is in the process of upgrading. This reflects the aggregate of all Storage Controller OS and firmware upgrades.
hw-revision	Hardware level of the power supply unit Note: The value is not always available. GUI and CLI do not display the value when unavailable.
identification	The panel label of the DAE Controller within its DAE
identify-led	Indicates whether the identification LED is illuminated for this DAE Controller. The property value is reflected in the GUI LED icon. Note: There is no identification LED in the current PSU. Values: • <code>off</code> - Identification LED is turned off. • <code>blinking</code> - Identification LED is blinking. • <code>on</code> - Identification LED is turned on. • <code>na</code> - This LED or reading of its value is not supported in the hardware.

DAE Controllers

Output Parameter	Description
index	DAE Controller's index number as defined by the XMS upon its creation (a unique positive number)
jbod-controller-id	The index number of the DAE Controller object
jbod-id	For the JBOD to which this DAE Controller belongs, a tuple array containing the following parameters (in the following order): the DAE object GUID identifier, the DAE Controller name, and the DAE index.
jbod-index	The Index of the DAE.
jbod-name	The DAE name.
lcc-health-level	The DAE Controller's health
location	The location of the DAE Controller within its DAE
location-index	Physical location of the component.
model-name	Vendor-assigned DAE Controller model name
name	DAE Controller's name
obj-severity	DAE Controller severity, based on severity level of current Alerts (Alerts still uncleared) for this DAE Controller Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
part-number	Dell EMC-assigned string identifying part (SKU). Independent of the actual vendor model_name used for this FRU
port-state	The status of the SAS port towards SIM.
sas1-brick-index	The index of X-Brick containing the Storage Controller that the SAS1 port is connected to. It should be 1 to 8 if connected and 0 if the port is disconnected. An error occurs if this X-Brick number differs from the X-Brick this Storage Controller belongs to.
sas1-node-index	Storage Controller's index within the X-Brick that the SAS1 port is connected to. It should be 1 to 2 if the port is connected or 0 if the port is disconnected.

DAE Controllers

Output Parameter	Description
sas1-port-enabled-state	The admin state of the SAS1 port. This property is set to <code>system_disabled</code> if too many SAS errors occur. The default value is <code>enabled</code> . Values: - enabled - user_disabled
sas1-port-in-node-index	The index of the port within the Storage Controller that the SAS1 port is connected to. It should be 1 to 2 if the port is connected or 0 if the port is not connected.
sas1-port-location	The location of the port within its DAE Controller
sas1-port-rate	Rate of the first serial attached SCSI (SAS) port used
sas1-port-state	State of the first serial attached SCSI (SAS) port used
sas2-brick-index	The index of the X-Brick containing the Storage Controller that the SAS2 port is connected to. It should be 1 to 8 if connected or 0 if the port is disconnected. An error occurs if this X-Brick number differs from the X-Brick this Storage Controller belongs to.
sas2-node-index	The index of the Storage Controller within the X-Brick that the SAS2 port is connected to. It should be 1 to 2 if the port is connected or 0 if the port is not connected.
sas2-port-enabled-state	The admin state of the SAS2 port. This property is set to <code>system_disabled</code> if too many SAS errors occur. The default value is <code>enabled</code> . Values: - enabled - user_disabled
sas2-port-in-node-index	The index of the port within the Storage Controller that the SAS1 port is connected to. It should be 1 to 2 if the port is connected or 0 if the port is not connected.
sas2-port-location	The location of the SAS2 port within its DAE Controller
sas2-port-rate	Rate of the second serial attached SCSI (SAS) port used Values: 12gbps 6gbps 3gbps - unknown
sas2-port-state	Status of the serial attached SCSI (SAS) port 2
sas-connectivity-state	Indicates if the port is physically connected and is at least partially working. The <code>sas_connectivity_state</code> of the DAE Controller port is reflected if the port is in degraded state.
serial-number	DAE Controller's serial number

DAE Controllers

Output Parameter	Description
status-led	LED state, indicating DAE Controller object faults
sys-id	For the cluster to which this DAE Controller belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
temperature-state	This Indicates whether any of the DAE sub components, such as SSD, DAE-Controller, or DAE-Row-Controller, have a temperature above normal. Critical/high/invalid temperature states may trigger HA events, such as SAS-path failover or stop-cluster. This relies on the most significant temperature-state of the DAE's sub components.
xms-id	For the XMS to which this DAE Controller belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/dae-controllers/219cc0c9d32d45d1a90031e4da91178e
HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
```

Cache-Control: no-cache

Response

```
{
  "content": {
    "fru-lifecycle-state": "healthy",
    "sas1-port-location": "left",
    "failure-reason": "none",
    "port-state": "up",
    "sas2-node-index": 0,
    "obj-severity": "information",
    "sas1-port-in-node-index": 0,
    "port-health-state": null,
    "temperature-state": "normal",
    "sas2-port-location": "right",
    "sas2-port-hardware-label": "Host3",
    "location-index": 1,
    "jbod-index": 1,
  }
}
```

```

"fru-replace-failure-reason": "",
"guid": "219cc0c9d32d45d1a90031e4da91178e",
"index": 1,
"hardware-label": "SIM0",
"port-health-level": null,
"fw-version-error": "no_error",
"jbod-name": "X1-DAE",
"sas1-port-rate": "12gbps",
"sas-connectivity-state": "0",
"identification": "lcc_a",
"location": "left",
"sas2-port-state": "up",
"identify-led": "off",
"sas1-port-hardware-label": "Host0",
"sas2-port-health-state": "healthy",
"brick-name": "X1",
"hw-revision": "",
"jbod-id": [
  "36fd5a8c537d4fd78803b3443cf1e0a8",
  "X1-DAE",
  1
],
"sas1-last-24h-number-of-phy-problems": 0,
"brick-id": [
  "f3c3795c03e64b369e6068b1c86cbb8e",
  "X1",
  1
],
"xms-id": [
  "76aab098d95a48beafd5a6b75c8a2ec5",
  "xms",
  1
],
"sas1-port-health-state": "healthy",
"sas1-port-state": "up",
"sas1-node-index": 0,
"sas1-port-health-level": "level_1_clear",
"port-enabled-state": null,
"sas1-port-enabled-state": "enabled",
"sys-name": "xbrickdrm1652",
"part-number": "105-000-470-XX",
"sas2-last-24h-number-of-phy-problems": 0,
"sys-id": [
  "4b7891fe67be4c00b7c9c194c54150eb",
  "xbrickdrm1652",
  1
],
"sas1-brick-index": 0,
"sas2-brick-index": 0,
"name": "X1-DAE-Controller-L",
"sys-index": 1,
"sas2-port-in-node-index": 0,
"jbod-controller-id": [
  "219cc0c9d32d45d1a90031e4da91178e",
  "X1-DAE-Controller-L",
  1
],
"sas2-port-rate": "12gbps",
"last-24h-number-of-phy-problems": null,

```

DAE Controllers

```
    "status-led": "off",
    "enabled-state": "enabled",
    "serial-number": "MQX62400078",
    "lcc-health-level": "level_1_clear",
    "fw-version": "1.22",
    "sas2-port-enabled-state": "enabled",
    "model-name": "QUANTA_SIM",
    "sas2-port-health-level": "level_1_clear",
    "brick-index": 1
  },
  "links": [
    {
      "guid": "219cc0c9d32d45d1a90031e4da91178e",
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-
controllers/219cc0c9d32d45d1a90031e4da91178e",
      "rel": "self"
    }
  ]
}
```

DAE Row Controllers

Note: DAE Row Controllers are available in X2 clusters only.

Viewing the List of DAE Row Controllers

GET /api/json/v3/types/dae-row-controllers

This command (GET /api/json/v3/types/dae-row-controllers) displays a list of DAE Row Controllers.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
cluster-id	Cluster's index number	No
cluster-name	Cluster's name	No

Example Request

```
GET /api/json/v3/types/dae-row-controllers HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

DAE Row Controllers

Response

```
{
  "dae-row-controllers": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-controllers/02506f7cc6f742369e7004a7d4ffa90a",
      "name": "X1-DAE-Row-Controller-L1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-controllers/c5e0f1d979ba4bdda584b22ae2b7c7f4",
      "name": "X1-DAE-Row-Controller-R1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-controllers/a1aa747e2191401c9301f4f4b923a3b7",
      "name": "X1-DAE-Row-Controller-L2",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-controllers/728a077378fe4a439f72f01886c4adfc",
      "name": "X1-DAE-Row-Controller-R2",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-controllers/79dc5f0b13434f48b7f1933991565620",
      "name": "X1-DAE-Row-Controller-L3",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-controllers/3713d511f5ac422eaa6bde62cb8166c4",
      "name": "X1-DAE-Row-Controller-R3",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-controllers/ff11efab40d44f97927c22fd4028789d",
      "name": "X1-DAE-Row-Controller-L4",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-controllers/e094395b77b14b08961514c6702d44de",
      "name": "X1-DAE-Row-Controller-R4",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-row-
```

```
controllers/",  
    "rel": "self"  
  }  
  ]  
}
```

DAE Row Controllers

Viewing the Details of DAE Row Controllers

Note: Supported for X2 hardware cluster types only.

GET /api/json/v3/types/dae-row-controllers/<parameter (dae-row-controller-guid or dae-row-controller-index or ?name=dae-row-controller-name)>

This command (GET /api/json/v3/types/dae-row-controllers/<parameter [dae-row-controller-guid or dae-row-controller-index or ?name=dae-row-controller-name]>) displays information about a DAE Row Controller identified by its Controller ID.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
dae-row-controller-guid	A unique identifier for the DAE Row-Controller	Select one of the following: - dae-row-controller – guid - dae-row-controller-index - dae-row-controller-name
dae-row-controller-index	The index of the DAE Row Controller.	
dae-row-controller-name	The name of the DAE Row Controller.	
- cluster-index - OR - cluster-name	The Cluster index or name of the DAE Row Controller.	- No – for single cluster configurations or if dae-row-controller-guid is specified - Yes – for multiple cluster configurations and if the dae-row-controller-guid is not specified

Note: Using the `dae-row-controller-guid` is recommended, because it eliminates the requirement for `cluster-id` in multiple cluster configurations.

Output Parameter	Description
<code>dae-row-controller-id</code>	The Id of the DAE Row Controller object (iSIM).
<code>enabled-state</code>	Indicates whether the Scheduler is currently enabled or disabled, by the user.
<code>failure-reason</code>	The reason why the FRU is diagnosed as failed. The PM populates this field.
<code>fru-lifecycle-state</code>	DAE Row Controller's FRU state, using the generic FRU transition states Values: <code>healthy</code> - The FRU is functional (although may not be fully functional) and diagnosed as healthy. <code>failed</code> - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. <code>disconnected</code> - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. <code>uninitialized</code> - An FRU that has not been initialized passes through this state before initialization. <code>initializing</code> - Indicates a transient state in which the system performs initialization of a component.
<code>fru-replace-failure-reason</code>	Reason why the FRU replacement has failed. <code>null</code> means that the last FRU replacement was either not performed for this object or the replacement was successful
<code>fw-version</code>	Current firmware version of the DAE Row Controller.
<code>fw-version-error</code>	The DAE Row Controller's FW failure reason diagnosed by the FRU. Values: <code>No Error</code> – The FW version and the target FW are the same. <code>Upgrading</code> – The FW version is in the process of upgrading. <code>Invalid FW version</code> – The FW version is invalid and cannot be used. <code>Mismatch FW version</code> – The FW version does not match the target FW version, is not optimal, but is usable.
<code>guid</code>	A unique identifier for the DAE Row Controller.
<code>hw-revision</code>	Hardware level of the DAE Row Controller Switch Note: The value is not always available. GUI and CLI do not display the value when unavailable.

DAE Row Controllers

Output Parameter	Description
identify-led	Indicates the LED (beacon) state of the LED indicating JBOD controller identification. The UI LED icon indicates this property's value. Note: X2 clusters use a single physical LED. Blue indicates Activity / Identity. Values: - off – The identification LED is turned off. - blinking – The identification LED is blinking. - on – The identification LED is on. - na – The LED is either not supported in the HW or reading its value is not supported.
index	The index of the DAE Row Controller.
jbod-controller-id	The DAE Row Controller object's ID.
jbod-id	For the JBOD to which this DAE Row Controller belongs, a tuple array containing the following parameters (in the following order): the DAE object GUID identifier, the DAE Controller name, and the DAE index.
jbod-index	The Index of the DAE.
jbod-name	The DAE name.
location	The DAE Row Controller's location within its JBOD.
location-index	The DAE Row Controller's index within its parent DAE.
managing-populated-row	A Boolean indicating whether the SSD row of the DAE Row Controller is populated.
model-name	The DAE Row Controller's vendor assigned model name.
name	The name of this DAE Row Controller.
obj-severity	DAE Row Controller's severity, based on severity level of current Alerts (Alerts still uncleared) for this Slot. Values: - clear - No Alerts exist for this entity. - information - The highest severity for this entity and all contained objects is information. - minor - The highest severity for this entity and all contained objects is minor. - major - The highest severity for this entity and all contained objects is major. - critical - The highest severity for this entity and all contained objects is critical.
part-number	Part number. Dell EMC-assigned string identifying part (SKU). Independent of the actual vendor model_name used for this FRU.
phy-ports	An array of the PHYs within the DAE Row Controller.

DAE Row Controllers

Output Parameter	Description
row-id	The number of the row in which the DAE Row Controller resides. The valid values are 1 to 4. The value of 0 is used before initialization.
sas1-port-enabled-state	The admin state of the DAE Row Controller's SAS1 port. This property is set to <code>system_disabled</code> if too many SAS errors occur. The default value is <code>enabled</code>. Values: • <code>enabled</code> • <code>user_disabled</code>
sas1-port-health-state	The DAE Row Controller SAS1 health state of the port. Values • <code>Healthy</code> – (<code>Enable_state = enabled</code>) AND (<code>health_level = level_1_clear</code> OR <code>health_level = level_2_known</code>) AND (<code>port_state</code> is UP). • <code>Failed</code> – (<code>Enable_state = system_disabled</code> OR <code>Enable_state = user_disabled</code>) OR (<code>port_state = down</code>). • <code>Degraded</code> – All other state combinations.
sas1-port-rate	The rate of the DAE Row Controller's SAS1 port. If one or more fails, then the port rate is less than optimal and performance towards the SSDs degrades. The optimal rate for GEN2 and GEN3 is 6 Gbps. The optimal rate for GEN 4 is 12 Gbps. Values: • <code>12gbps</code> • <code>6gbps</code> • <code>3gbps</code> • <code>unknown</code>
sas1-port-state	The status of the SAS1 port towards the SIM. Values: • <code>up</code> – The port is connected and can run traffic. The <code>sas_connectivity_state_cause_property</code> indicates if the port is in a degraded state. • <code>down</code> – The port is disconnected. • <code>unknown</code> – The port state is unknown.
serial-number	The DAE Row Controller's serial number. This value is NULL if the DAE Row Controller does not have a serial number or the serial number cannot be determined.

DAE Row Controllers

Output Parameter	Description
status-led	Indicates the LED (beacon) state of the LED indicating JBOD Row controller identification. The UI LED icon indicates this property's value. Note: X2 clusters use a single physical LED. Blue indicates Activity / Identity. Values: - off – The identification LED is turned off. - blinking – The identification LED is blinking. - on – The identification LED is on. - na – The LED is either not supported in the HW or reading its value is not supported.
sys-id	For the cluster to which this DAE Row Controller belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
temperature	The DAE Row Controller's temperature in C. The value of 1111 indicates either no temperature reading or a bad sensor. The minimum temperature is -20C. The maximum temperature is 140C.
temperature-state	This Indicates whether any of the DAE Row Controller temperature is above normal. Critical/high/invalid temperature states may trigger HA events, such as SAS-path failover or stop-cluster. This relies on the most significant temperature-state of the DAE's sub components. Values: - Normal – The temperature level is below the DAE Row Controller's high temperature threshold. - High - The temperature level is between the DAE Row Controller's high temperature threshold and the critical threshold. - Critical - The temperature level is above the DAE Row Controller's critical temperature threshold. - Invalid – The PM failed to read the sensor for 5 consecutive attempts or 5 consecutive readings are outside the expected temperature range.

Example Request

```
GET /api/json/v3/types/dae-row-controllers/5541688196d3453ba3850e26b606363c
HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

DAE Row Controllers

```

{
  "content": {
    "fru-lifecycle-state": "healthy",
    "failure-reason": "none",
    "obj-severity": "information",
    "sys-index": 1,
    "serial-number": "DQX62800487",
    "enabled-state": "enabled",
    "location-index": 4,
    "fru-replace-failure-reason": "",
    "guid": "5541688196d3453ba3850e26b606363c",
    "phy-ports": null,
    "index": 8,
    "hardware-label": "iSIM7",
    "row-id": 4,
    "temperature": 40,
    "dae-row-controller-id": [
      "5541688196d3453ba3850e26b606363c",
      "X1-DAE-Row-Controller-R4",
      8
    ],
    "fw-version-error": "no_error",
    "jbod-name": "X1-DAE",
    "sas1-port-rate": "12gbps",
    "location": "right",
    "identify-led": "off",
    "hw-revision": "",
    "jbod-id": [
      "b670c9fb3d9140c1bd3bbabb9994d93b",
      "X1-DAE",
      1
    ],
    "managing-populated-row": 0,
    "jbod-index": 1,
    "sas1-port-health-state": "healthy",
    "sas1-port-state": "up",
    "sas1-port-enabled-state": "enabled",
    "sys-name": "xbrickdrm919",
    "part-number": "105-001-024-XX",
    "sys-id": [
      "7e0bbd4b7d69477ab32e2953636a70de",
      "xbrickdrm919",
      1
    ],
    "name": "X1-DAE-Row-Controller-R4",
    "oper-status": "up",
    "status-led": "off",
    "jbod-controller-id": [
      "9eb5c756fd9a4bec9ddf275d25c1fe0e",
      "X1-DAE-Controller-L",
      1
    ],
    "temperature-state": "normal",
    "fw-version": "1.22",
    "model-name": "QUANTA_ISIM"
  },
  "links": [

```

```
{
  "guid": "5541688196d3453ba3850e26b606363c",
  "href": "https://vxms-xbrickdrm919/api/json/v3/types/dae-row-
controllers/5541688196d3453ba3850e26b606363c",
  "rel": "self"
}
```

DAE PSUs

DAE PSUs

Viewing the List of DAE PSUs

GET /api/json/v3/types/dae-psus

This command (GET /api/json/v3/types/dae-psus) displays the list of DAE PSUs.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	For a single cluster configuration: - No For a multiple cluster configuration: - No – to list all DAE PSUs for all clusters - Yes – to list only DAE PSUs for a specific cluster

Example Request

GET /api/json/v3/types/dae-psus HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "dae-psus": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-psus/8474bc1708164e40affa51514c36ac5e",
      "name": "X1-DAE-PSU1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-psus/c42e74e8adec4b13abd03879bdd34d64",
      "name": "X1-DAE-PSU-L",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-psus/6a682bd20084493994c69cf35f63b841",
      "name": "X1-DAE-PSU2",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-psus/2cb5a69ede594b70ac4a3f66f60c7e99",
      "name": "X1-DAE-PSU-R",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/dae-psus/",
      "rel": "self"
    }
  ]
}
```

DAE PSUs

Viewing the Details of a DAE PSU

GET /api/json/v3/types/dae-psus/<parameter (dae-psus-guid or dae-psus-index or ?name=dae-psus-name)>

This command (GET /api/json/v3/types/dae-psus/<parameter [dae-psus-guid or dae-psus-index or ?name=dae-psus-name]>) displays the details of the selected DAE PSU.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
dae-psus-guid	A unique identifier for the DAE PSU.	Select one of the following: • dae-psus-guid • dae-psus-id • dae-psus-name
dae-psus-index	The index of the DAE PSU.	
dae-psus name	The name of the DAE PSU.	
• cluster-index - OR • cluster-name	The Cluster index or name of the DAE PSU.	• No – for single cluster configurations or if dae-psus-guid is specified • Yes – for multiple cluster configurations and if the dae-psus-guid is not specified

Output Parameter	Description
brick-id	For the X-Brick to which this DAE PSU belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
enabled-state	Indicates whether DAE PSU is currently enabled or disabled, either by the user or the cluster.

Output Parameter	Description
fru-lifecycle-state	DAE PSU's FRU state, using the generic FRU transition states Values: • healthy - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • failed - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • disconnected - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • uninitialized - An FRU that has not been initialized passes through this state before initialization. • initializing - Indicates a transient state in which the system performs initialization of a component.
fru-replace-failure-reason	Reason why the FRU replacement has failed. null means that the last FRU replacement was either not performed for this object or the replacement was successful.
fw-version	Current firmware version of the DAE PSU
fw-version-error	Indicates if the firmware or OS upgrade has failed or is in the process of upgrading. This reflects the aggregate of all Storage Controller OS and firmware upgrades.
hw-revision	Hardware level of the power supply unit Note: The value is not always available. GUI and CLI do not display the value when unavailable.
identification	The panel label of the DAE PSU within its DAE
identify-led	Indicates whether the identification LED is illuminated for this DAE PSU. The property value is reflected in the GUI LED icon. Note: There is no identification LED in the current PSU. Values: • off - Identification LED is turned off. • blinking - Identification LED is blinking. • on - Identification LED is turned on. • na - This LED or reading of its value is not supported in the hardware.
index	DAE PSU's index number as defined by the XMS upon its creation (a unique positive number)
input	Confirms the existence of input power to the supply. The underlying sensors can be read in the Storage Controller's sensor arrays.

DAE PSUs

Output Parameter	Description
jbod-id	For the JBOD to which this DAE PSU belongs, a tuple array containing the following parameters (in the following order): the DAE object GUID identifier, the DAE Controller name, and the DAE index.
jbod-index	The Index of the DAE.
jbod-name	The DAE name.
jbod-psu-id	The identity number of the DAE PSU object
location	The location of the DAE PSU within its DAE
location-index	The physical location of the component.
model-name	Vendor-assigned DAE PSU model name
name	DAE PSU's name
obj-severity	DAE PSU severity, based on severity level of current Alerts (Alerts still uncleared) for this DAE PSU Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
part-number	Dell EMC-assigned string identifying part (SKU), independent of the actual vendor model name used for this FRU
power-failure	Shows details pertaining to the nature of a power failure, should one occur.
power-feed	Power into PSU typically has two feeds: A and B Typical configuration: • The first InfiniBand Switch PSU is connected to feed_A. • The second InfiniBand Switch PSU is connected to feed_B.
serial-number	DAE PSU's serial number
status-led	LED state indicating DAE PSU object faults
sys-id	For the cluster to which this DAE PSU belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.

Output Parameter	Description
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.

Example Request

GET /api/json/v3/types/dae-psus/90fb3989466949458d89288b6a005d2b HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

DAE PSUs

Response

```
{
  "content": {
    "fru-lifecycle-state": "healthy",
    "jbod-psu-id": [
      "90fb3989466949458d89288b6a005d2b",
      "X1-DAE-PSU-R",
      2
    ],
    "obj-severity": "information",
    "sys-index": 1,
    "power-feed": "PWR-A",
    "serial-number": "6E5QX0101G15060",
    "location-index": 2,
    "fru-replace-failure-reason": "",
    "guid": "90fb3989466949458d89288b6a005d2b",
    "index": 2,
    "hardware-label": "PSU1",
    "fw-version-error": "no_error",
    "jbod-name": "X1-DAE",
    "identification": "psu_a",
    "location": "right",
    "identify-led": "na",
    "input": "on",
    "brick-name": "X1",
    "hw-revision": "",
    "jbod-id": [
      "b670c9fb3d9140c1bd3bbabb9994d93b",
      "X1-DAE",
      1
    ],
    "jbod-index": 1,
    "fw-version": "0.05.0",
    "sys-name": "xbrickdrm919",
    "part-number": "105-000-466-XX",
    "sys-id": [
      "7e0bbd4b7d69477ab32e2953636a70de",
      "xbrickdrm919",
      1
    ],
    "power-failure": "no_error",
    "name": "X1-DAE-PSU-R",
    "brick-id": [
      "bb1a71566d7e4756a4e902bc7a029e57",
      "X1",
      1
    ],
    "status-led": "na",
    "enabled-state": "enabled",
    "model-name": "QUANTA_PSU",
    "brick-index": 1
  },
  "links": [
    {
      "guid": "90fb3989466949458d89288b6a005d2b",
```

```
        "href": "https://vxms-xbrickdrm919/api/json/v3/types/dae-  
psus/90fb3989466949458d89288b6a005d2b",  
        "rel": "self"  
    }  
  ]  
}
```

Data Protection Groups

Viewing the List of Data Protection Groups

GET /api/json/v3/types/data-protection-groups

This command (GET /api/json/v3/types/data-protection-groups) lists the XtremIO Data Protection Groups (DPGs).

Example Request

```
GET /api/json/v3/types/data-protection-groups HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "data-protection-groups": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/data-
      protection-groups/6d4284f01e0042799a3a337372e57439",
      "name": "X1-DPG"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/data-
      protection-groups/94deadd03e72488096c45b8885accf4e",
      "name": "X1-DPG-1"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/data-
      protection-groups/",
      "rel": "self"
    }
  ]
}
```


Viewing the Details of a Data Protection Group

GET /api/json/v3/types/data-protection-groups/<parameter (dpg-guid or dpg-index or ?name=dpg-name)>

This command (GET /api/json/v3/types/data-protection-groups/<parameter [dpg-guid or dpg-index or ?name= dpg-name]>) displays the selected XtremIO Data Protection Group (DPG) details.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
dpg-guid	A unique identifier for the DPG.	Select one of the following:
dpg-index	The index of the DPG.	
dpg-name	The name of the DPG.	
- cluster-index OR - cluster-name	The Cluster index or name of the DPG.	- No – for single cluster configurations or if dpg-guid is specified - Yes – for multiple cluster configurations and if the dpg-guid is not specified

Output Parameter	Description
available-rebuilds	Number of available rebuilds the DPG can currently perform
brick-id	For the X-Brick to which this DPG belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
bw	DPG's total read and write bandwidth, measured in MB per second
dpg-state	The logical state of the RAID group. This shows whether the DPG is working normally, or a rebuild or integrate is in progress. This is used to alert the user that performance degradation may be expected.

Data Protection Groups

Output Parameter	Description
guid	A unique identifier for the Data Protection Group
index	DPG's index number as defined by the XMS upon its creation (a unique positive number)
integrating-slot-num	Slot currently undergoing processing. The value is 0 when no specific Slot is undergoing processing.
iops	DPG's total read and write real-time input/output operations per second
name	DPG's name as defined by the XMS upon its creation (a unique name)
node-list	A list of the X-Brick's Storage Controllers.
num-of-nodes	DPG's total number of Storage Controllers.
num-of-ssds	DPG's total number of the SSDs.
obj-severity	DPG's severity, based on severity level of current Alerts (Alerts still uncleared) for this DPG Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
proactive-metadata-loading	This Boolean property reflects whether the cluster performs proactive loading of the metadata (property returns <code>true</code>). This may happen after the cluster is started or recovers from an extreme situation. At this stage, there may be performance degradation.
protection-state	DPG's protection state. If the DPG is currently under initial configuration, the parameter is initializing.
rd-bw	DPG's total read bandwidth in MB per second
rd-iops	Total read real-time input/output operations per second
rebalance-progress	Shows the progress of a DPG rebalance.
rebuild-in-progress	Indicates if the DPG currently performs a rebuild, and its progress, measured in percentage.
rebuild-prevention-reason	When an DPG enters a degraded state (either single or dual failure), a rebuild is generally initiated. However, conditions may prevent the rebuild. The parameter includes the reason for rebuild prevention.
rebuild-progress	The rebuild progress status

Data Protection Groups

Output Parameter	Description
rg-id	For the DPG, a tuple array containing the following parameters (in the following order): the DPG's object GUID identifier, the DPG name, and the DPG index..
rg-ud-ssd-percent-free-space	DPG's percentage of SSD free space for user data
rg-ud-ssd-space-levels	DPG user data SSD space levels. Events are triggered for any change in this parameter. Note: For XMS version 4.2.0, the only value listed is obsolete.
ssd-preparation-in-progress	Indicates if the DPG is currently performing an SSD preparation, and its progress, measured in percentage.
ssd-preparation-progress	The current state of the SSD preparation
ssd-size	DPG's overall size of unfailed SSDs
ssd-space-in-use	The actual number of Kbytes written by the user to the SSD. The Kbyte calculation occurs after compression. This is the actual physical consumption of blocks.
sys-id	For the cluster to which this DPG belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	DPG's list of Tags
ud-ssd-space	Total user data space on the SSDs
ud-ssd-space-in-use	Reports how much of user data space of the DPG is currently in use, measured in Kbytes.
useful-ssd-space	DPG's total amount of useful SSD space over all unfailed SSDs, for this DPG
wr-bw	DPG's total real-time write bandwidth, in MB per second
wr-iops	Total write real-time input/output operations per second
xms-id	For the XMS to which this DPG belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/data-protection-groups/6d4284f01e0042799a3a337372e57439
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
```

Data Protection Groups

Cache-Control: no-cache

Response

```
{
  "content": {
    "ssd-size": "9765625000",
    "rebuild-prevention-reason": "none",
    "obj-severity": "information",
    "rd-bw": "0",
    "sys-index": 2,
    "dpg-state": null,
    "iops": "0",
    "available-rebuilds": "5",
    "ssd-preparation-progress": 0,
    "rg-id": [
      "6d4284f01e0042799a3a337372e57439",
      "X1-DPG",
      1
    ],
    "guid": "6d4284f01e0042799a3a337372e57439",
    "index": 1,
    "num-of-nodes": 2,
    "rg-ud-ssd-percent-free-space": 0,
    "ssd-space-in-use": "0",
    "integrating-slot-num": 255,
    "brick-name": "X1",
    "node-list": [
      [
        "849eeb1830e94c7586ca201c59f6609a",
        "X1-SC1",
        1
      ],
      [
        "872de033f3964405b4dce7513c5996e6",
        "X1-SC2",
        2
      ]
    ],
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "protection-state": "normal",
    "rebuild-in-progress": "done",
    "num-of-ssds": 25,
    "tag-list": [],
    "rg-ud-ssd-space-levels": "obsolete",
    "bw": "0",
    "sys-name": "xbrickdrm847",
    "wr-iops": "0",
    "ud-ssd-space-in-use-ratio": null,
    "sys-id": [
      "3139f69b7b0e4b21a013bfc45d4fb00",
      "xbrickdrm847",
      1
    ]
  }
}
```

```

        2
      ],
      "rd-iops": "0",
      "name": "X1-DPG",
      "ssd-preparation-in-progress": "done",
      "ud-ssd-space-in-use": "0",
      "brick-id": [
        "e2ee8c88151b491489e9ca86e37658b7",
        "X1",
        1
      ],
      "rebalance-progress": null,
      "ud-ssd-space": "8146708712",
      "proactive-metadata-loading": false,
      "rebuild-progress": 0,
      "wr-bw": "0",
      "useful-ssd-space": "9765625000",
      "brick-index": 1
    },
    "links": [
      {
        "guid": "6d4284f01e0042799a3a337372e57439",
        "href": "https://vxms-xbrickdrm919/api/json/v3/types/data-
protection-groups/6d4284f01e0042799a3a337372e57439",
        "rel": "self"
      }
    ]
  }
}

```

Debug Information Log Bundles

Debug Information Log Bundles

Viewing the List of Debug Information Log Bundles

GET /api/json/v3/types/debug-info

This command (GET /api/json/v3/types/debug-info) displays the list of the debug information log bundles currently stored by the XMS.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

```
GET /api/json/v3/types/debug-info HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "debug-info": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/debug-
info/af92bbcea9a04755bab2df7f277a5dc2",
      "name": ""
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/debug-
info/2653c9a15077454db426f480a0fef09e",
      "name": ""
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/debug-
info/823900226a584fd2a012f2bff3451046",
      "name": ""
    }
  ]
}
```

```
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/debug-
info/c431000c08794082ad8fe4d8ec901202",
      "name": ""
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/debug-info/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of a Debug Information Log Bundle

GET /api/json/v3/types/debug-info/<parameter (debug-info-guid or debug-info-index or ?name=debug-info-name)>

This command (GET /api/json/v3/types/debug-info/<parameter [debug-info-guid or debug-info-index or ?name= debug-info-name]>) displays the details of the selected Debug Information Log Bundle, including its hyperlink.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
debug-info-guid	A unique identifier for the Debug Information Log Bundle.	Select one of the following: - debug-info guid - debug-info-index - debug-info-name
debug-info-index	The index of the Debug Information Log Bundle.	
debug-info-name	The name of the Debug Information Log Bundle.	

Debug Information Log Bundles

- cluster-index - OR - cluster-name	The Cluster index or name of the Debug Information Log Bundle.	- No – for single cluster configurations or if debug-info guid is specified - Yes – for multiple cluster configurations and if the debug-info guid is not specified
duration	Monitor duration (seconds).	No
frequency	Monitor frequency (seconds)	No

Output Parameter	Description
create-timestamp	The time the log bundle process completed and the log bundle was created (seconds since 1/1/1970). Note: The log bundle process can take 15 – 30 minutes. start-timestamp indicates the start of the process and create-timestamp indicates the completion of the process.
creation-status	The debug information collection phase/status.
debug-level	Indicates the contents of the log bundle and the expected size. Values: - small – the log bundle contains the last 10 last minutes of /var/log/messages, SYM repository, OpenSM log, XMS log, audit log, back traces, configuration. The expected size is 20-50K per brick. - medium – the log bundle contains everything included in a small debug-level log bundle, as well as all of /var/log. The expected size is 30-50MB per brick. The default value is medium.
guid	The globally unique identifier of this debug log bundle.
index	The index of this debug log bundle.
name	The name of this debug log bundle.
output-url	The complete URL of the debug log bundle.

Debug Information Log Bundles

start-timestamp	The time the log bundle process began to create the log bundle (seconds since 1/1/1970). Note: The log bundle process can take 15 – 30 minutes. start-timestamp indicates the start of the process and create-timestamp indicates the completion of the process.
sys-index	The debug log bundle's Cluster index.
sys-name	The debug log bundle's Cluster name.
with-perf-data	Indicates whether the debug log bundle includes performance data. Values: - true – the debug log bundle includes performance data - false – the debug log bundle does not include performance data
with-vmcore	Indicates whether the debug log bundle includes VMware data. Values: - true – the debug log bundle includes VMware - false – the debug log bundle does not include VMware

Example Request

GET /api/json/v3/types/debug-info/c431000c08794082ad8fe4d8ec901202 HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Debug Information Log Bundles

Response

```
{
  "content": {
    "index": 10,
    "create-timestamp": "1526913935000",
    "name": "",
    "output-url":
"https://10.102.68.193/xtremapp/DebugInfo/XI000171313881_xbrickdrm1652_2018_05_2
1_164535_medium.tar.gz",
    "creation-status": "not_initialized",
    "debug-level": "medium",
    "sys-index": "",
    "with-perf-data": false,
    "start-timestamp": "1526913935000",
    "sys-name": "",
    "guid": "c431000c08794082ad8fe4d8ec901202",
    "with-vmcore": false
  },
  "links": [
    {
      "guid": "c431000c08794082ad8fe4d8ec901202",
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/debug-
info/c431000c08794082ad8fe4d8ec901202",
      "rel": "self"
    }
  ]
}
```

Discover Initiators

Viewing the List of Discovered Initiators

GET /api/json/v3/types/discover-initiators

This command (GET /api/json/v3/types/discover-initiators) displays a list of the Initiators that were discovered on the SCSI network, but are not yet added to the system.

Output Parameter	Description
num-of-conn-tars	The number of target ports that detect this Initiator
port-address	The following input format variations are accepted for Fibre Channel Initiators ("X" is a hexadecimal digit – upper case or lower case are allowed): "XX:XX:XX:XX:XX:XX" "XXXXXXXXXXXXXXXX" "0XXXXXXXXXXXXXXXX" When the Initiator object port-address parameter is queried, the value is always returned in a single output format. IQN and EUI formats are allowed for iSCSI Initiators.
port-type	Port type (Fibre Channel or iSCSI)
sys-id	For the cluster to which this Initiator belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
target-list	A list of all target ports (separated by a comma) that "discovered" this initiator.

Example Request

```
GET /api/json/v3/types/discover-initiators HTTP/1.1
Host: vxms-xbrickdrm1271.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Discover Initiators

Response

```
{
  "content": [
    {
      "port-address": "10:00:00:90:fa:a0:78:b6",
      "target-list": [
        [
          "4e2c2730e18c492681e10b5eddb58916",
          "X1-SC1-target3",
          3
        ],
        [
          "c75228994e924b9f9cc1f92aed690cab",
          "X1-SC1-target4",
          4
        ],
        [
          "2a0e4aaa43c742fba5fb2b63ecdd60ae",
          "X1-SC2-target3",
          8
        ],
        [
          "00737c30bded494b83df664a0ea0ea81",
          "X1-SC2-target4",
          9
        ]
      ],
      "sys-id": [
        "6b629139390d4a3185b6dd8961f2aa4f",
        "xbrickdrm1271",
        1
      ],
      "num-of-conn-tars": 4,
      "port-type": "fc"
    },
    {
      "port-address": "10:00:00:90:fa:a0:78:b7",
      "target-list": [
        [
          "4e2c2730e18c492681e10b5eddb58916",
          "X1-SC1-target3",
          3
        ],
        [
          "c75228994e924b9f9cc1f92aed690cab",
          "X1-SC1-target4",
          4
        ],
        [
          "2a0e4aaa43c742fba5fb2b63ecdd60ae",
          "X1-SC2-target3",
          8
        ],
        [
          "00737c30bded494b83df664a0ea0ea81",
          "X1-SC2-target4",
          9
        ]
      ]
    }
  ]
}
```

```

        "X1-SC2-target4",
        9
    ],
    "sys-id": [
        "6b629139390d4a3185b6dd8961f2aa4f",
        "xbrickdrm1271",
        1
    ],
    "num-of-conn-tars": 4,
    "port-type": "fc"
},
{
    "port-address": "10:00:00:90:fa:a0:78:c7",
    "target-list": [
        [
            "4e2c2730e18c492681e10b5eddb58916",
            "X1-SC1-target3",
            3
        ],
        [
            "c75228994e924b9f9cc1f92aed690cab",
            "X1-SC1-target4",
            4
        ],
        [
            "2a0e4aaa43c742fba5fb2b63ecdd60ae",
            "X1-SC2-target3",
            8
        ],
        [
            "00737c30bde494b83df664a0ea0ea81",
            "X1-SC2-target4",
            9
        ]
    ],
    "sys-id": [
        "6b629139390d4a3185b6dd8961f2aa4f",
        "xbrickdrm1271",
        1
    ],
    "num-of-conn-tars": 4,
    "port-type": "fc"
},
{
    "port-address": "10:00:00:90:fa:a0:78:c6",
    "target-list": [
        [
            "4e2c2730e18c492681e10b5eddb58916",
            "X1-SC1-target3",
            3
        ],
        [
            "c75228994e924b9f9cc1f92aed690cab",
            "X1-SC1-target4",
            4
        ],
        [
            "2a0e4aaa43c742fba5fb2b63ecdd60ae",

```

Discover Initiators

```

        "X1-SC2-target3",
        8
      ],
      [
        "00737c30bded494b83df664a0ea0ea81",
        "X1-SC2-target4",
        9
      ]
    ],
    "sys-id": [
      "6b629139390d4a3185b6dd8961f2aa4f",
      "xbrickdrm1271",
      1
    ],
    "num-of-conn-tars": 4,
    "port-type": "fc"
  }
},
"links": [
  {
    "href": "https://vxms-xbrickdrm1271/api/json/v3/types/discover-
initiators/",
    "rel": "self"
  }
]
}

```

Email Notifiers

Viewing the List of Email Notifiers

GET /api/json/v3/types/email-notifier

This command (GET /api/json/v3/types/email-notifier) displays the list of Email Notifiers.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example Request

GET /api/json/v3/types/email-notifier HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "email-notifier": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/email-notifier/fd065b688b7848f7a07772bd6a5616f5",
      "name": "email_notifier"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/email-notifier/",
      "rel": "self"
    }
  ]
}
```

Email Notifiers

Viewing the Details of an Email Notifier

GET /api/json/v3/types/email-notifier/<parameter (email-notifier-guid or email-notifier-index or ?name= email-notifier-name)>

This command (GET /api/json/v3/types/email-notifier/<parameter [email-notifier-guid or email-notifier-index or ?name= email-notifier-name]>) displays the details of the selected Email Notifier.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
email-notifier-guid	A unique identifier for the Email Notifier.	Select one of the following: - email-notifier-guid - email-notifier-index - email-notifier-name
email-notifier-index	The index of the Email Notifier.	
email-notifier-name	The name of the Email Notifier.	

Output Parameter	Description
company-name	Name of the company
contact-details	Details of the company individual to contact
enabled	Indicates whether or not the Email Notifier is enabled.
frequency	Frequency, in hours
index	Email Notifier's account's index number as defined by the XMS upon its creation (a unique positive number)
mail-relay-address	Address of email server to route emails
mail-user	Name of the email user
name	Email Notifier's name as defined by the user when creating the Email Notifier

Output Parameter	Description
obj-severity	Email Notifier severity, based on severity level of current Alerts (Alerts still uncleared) for this Email Notifier Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
proxy-address	The proxy server address
proxy-port	Proxy server port on a specific port number on the proxy server
proxy-user	Name of Email Notifier proxy user
recipients	Email Notifier recipients
recipients-str	Presents the list of email recipients.
sender	Email Notifier's sender
transport	The transport protocol, either SMTP or HTTP
xms-id	For the XMS to which this Email Notifier belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Email Notifiers

Example Request

```
GET /api/json/v3/types/email-notifier/fd065b688b7848f7a07772bd6a5616f5
HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "recipients": [
      "fsdfsd@fdf.df"
    ],
    "obj-severity": "information",
    "proxy-port": null,
    "mail-relay-address": "nvbvfbhgf",
    "mail-user": "shay",
    "company-name": "gfgf",
    "recipients-str": "[u'fsdfsd@fdf.df']",
    "proxy-address": null,
    "guid": "fd065b688b7848f7a07772bd6a5616f5",
    "transport": null,
    "sender": "dfgdfgdf@dfd.bv",
    "index": 1,
    "name": "email_notifier",
    "enabled": true,
    "frequency": 86400,
    "contact-details": "hgfh",
    "proxy-user": null
  },
  "links": [
    {
      "guid": "fd065b688b7848f7a07772bd6a5616f5",
      "href": "https://vxms-xbrickdr919/api/json/v3/types/email-notifier/fd065b688b7848f7a07772bd6a5616f5",
      "rel": "self"
    }
  ]
}
```

Modifying an Email Notifier

PUT /api/json/v3/types/email-notifier/<parameter (email-notifier-id or ?name=email-notifier-name)>

This command (PUT /api/json/v3/types/email-notifier/<parameter [email-notifier-id or ?name=email-notifier-name]>) enables you to rename the selected Email Notifier.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
email-notifier-guid	A unique identifier for the Email Notifier.	Select one of the following: - email-notifier-guid - email-notifier-index - email-notifier-name
email-notifier-index	The index of the Email Notifier.	
email-notifier-name	The name of the Email Notifier.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
add-recipient	Adds one recipient to the list	No
company-name	Company name	No
contact-details	Contact details	No
disable	Disables the notifications Values: - Yes - No	No
enable	Enables the notifications Values: - Yes - No	No
mail-password	Mail password	No
mail-relay-address	Mail relay address	No
mail-user	Mail user	No

Email Notifiers

Input Parameter	Description	Mandatory
recipient-list	List of email recipients	No
remove-recipient	Removes one recipient from the list	No
reset-configuration	Reset configuration	No
sender	Sender	No

Example Request

PUT /api/json/v3/types/email-notifier/df4b13acef01420f964475de90f0d4c5
HTTP/1.1
Host: vxms-xbrickdrm788.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{
 "recipient-list": ["fred1@emc.com", "fred2@emc.com"],
 "mail-relay-address": "emailhub.emc.com",
 "mail-user": "user",
 "mail-password": "123456",
 "sender": "fred@emc.com"
}

Response

Note: The successful completion of this command returns no response.

Events

Viewing the List of Events in the Cluster

GET /api/json/v3/types/events

This command (GET /api/json/v3/types/events) displays the list of Events in the cluster.

Note: The output of this command may be lengthy. To manage the command output, see [Generating Output and Filtering](#) on page 28.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
from-date-time	Date and time from which to filter Events. The syntax requires the following: - the year must be 4-digits - the month, day, hour, minute, and second must be 2-digits. - use %20 for spaces - use %3A for colons (":") Format: "yyyy-mm-dd%20hh%3Amm%3Ass" For example, September 3, 2018 at 15:26:16: "2018-09-03%2015%3A26%3A16"	No
to-date-time	Date and time until which to filter Events. The syntax requires the following: - the year must be 4-digits - the month, day, hour, minute, and second must be 2-digits. - use %20 for spaces - use %3A for colons (":") Format: " yyyy-mm-dd%20hh%3Amm%3Ass" For example, for September 3, 2018 at 16:30:00 use: "2018-09-03%2016%3A26%3A00"	No
Output Parameter	Description	
classification	Describes the category of the Event.	
cluster	Cluster name to which the Event/Alert relates to	

Events

Input Parameter	Description	Mandatory
description	Event/Alert text	
entity	The object to which the Event/Alert relates to	
entity-details	Entity's name and index number	
event-code	XtremIO code for this Event /Alert	
id	Identification number	
severity	The severity of the Event/Alert Values: • Information • Minor • Major • Critical	
timestamp	Denotes when the Event/Alert was issued (UTC).	

Example Request

GET /api/json/v3/types/events HTTP/1.1
Host: vxms-xbrick1271.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

	Events
Response	

Events

```

{
  "events": [
    {
      "entity_details": null,
      "severity": "information",
      "classification": "activity",
      "timestamp": "2018-02-14 10:58:26.087567",
      "entity": null,
      "entity_guid": null,
      "cluster": null,
      "event_code": "5000200",
      "cluster_guid": null,
      "id": 88,
      "description": "Command send_syr_notification Timeout"
    },
    {
      "entity_details": null,
      "severity": "information",
      "classification": "activity",
      "timestamp": "2018-02-14 10:53:25.523015",
      "entity": null,
      "entity_guid": null,
      "cluster": null,
      "event_code": "5000200",
      "cluster_guid": null,
      "id": 87,
      "description": "Calling collector command:
/var/www/xtremapp/DebugInfo/XtremIODossier_SYR00010910001_xbrickdrm1271_2018_02_
14_125325_small.tar.bz2 --timeout normal"
    },
    {
      "entity_details": null,
      "severity": "information",
      "classification": "audit",
      "timestamp": "2018-02-14 10:53:16.097080",
      "entity": null,
      "entity_guid": null,
      "cluster": null,
      "event_code": "5000100",
      "cluster_guid": null,
      "id": 86,
      "description": "User: tech, Command: send_syr_notification,
Arguments: {test_event=False, sys_id=[\"\", \"\", \"1\"], receiver_id=1}"
    },
    {
      "entity_details": null,
      "severity": "information",
      "classification": "security",
      "timestamp": "2018-02-14 10:53:14.983171",
      "entity": null,
      "entity_guid": null,
      "cluster": null,
      "event_code": "5000100",
      "cluster_guid": null,
      "id": 85,
    }
  ]
}

```



```

        "description": "User: tech, logged in successfully"
    },
    {
        "entity_details": null,
        "severity": "information",
        "classification": "security",
        "timestamp": "2018-02-14 10:53:13.854328",
        "entity": null,
        "entity_guid": null,
        "cluster": null,
        "event_code": "5000100",
        "cluster_guid": null,
        "id": 84,
        "description": "User: tech, logged in successfully"
    },
    {
        "entity_details": "X1-SC1-LocalDisk1 [1]",
        "severity": "information",
        "classification": "software",
        "timestamp": "2018-02-14 10:52:51.512276",
        "entity": "LocalDisk",
        "entity_guid": "53563a5fe5d040a0bca9b142ff73e883",
        "cluster": "xbrickdrm1271 [1]",
        "event_code": "0500303",
        "cluster_guid": "6b629139390d4a3185b6dd8961f2aa4f",
        "id": 83,
        "description": "Removed alert: \"Storage Controller's local disk has
failed.\" object: X1-SC1-LocalDisk1"
    },
    {
        "entity_details": "X1-SC1-LocalDisk1 [1]",
        "severity": "information",
        "classification": "state_change",
        "timestamp": "2018-02-14 10:52:51.439242",
        "entity": "LocalDisk",
        "entity_guid": "53563a5fe5d040a0bca9b142ff73e883",
        "cluster": "xbrickdrm1271 [1]",
        "event_code": "0500301",
        "cluster_guid": "6b629139390d4a3185b6dd8961f2aa4f",
        "id": 82,
        "description": "Lifecycle state of the Storage Controller local disk
has changed from failed to healthy."
    },
    {
        "entity_details": "X1-SC1-LocalDisk1 [1]",
        "severity": "major",
        "classification": "software",
        "timestamp": "2018-02-14 10:52:11.818486",
        "entity": "LocalDisk",
        "entity_guid": "53563a5fe5d040a0bca9b142ff73e883",
        "cluster": "xbrickdrm1271 [1]",
        "event_code": "0500303",
        "cluster_guid": "6b629139390d4a3185b6dd8961f2aa4f",
        "id": 81,
        "description": "Raised alert: \"Storage Controller's local disk has
failed.\" object: X1-SC1-LocalDisk1 severity: major threshold: "
    },
    {
        "entity_details": "X1-SC1-LocalDisk1 [1]",

```

Events

```

        "severity": "information",
        "classification": "state_change",
        "timestamp": "2018-02-14 10:52:11.410283",
        "entity": "LocalDisk",
        "entity_guid": "53563a5fe5d040a0bca9b142ff73e883",
        "cluster": "xbrickdrm1271 [1]",
        "event_code": "0500303",
        "cluster_guid": "6b629139390d4a3185b6dd8961f2aa4f",
        "id": 80,
        "description": "Lifecycle state of the Storage Controller local disk
has changed from healthy to failed."
    },
    ...
    {
        "entity_details": null,
        "severity": "information",
        "classification": "security",
        "timestamp": "2018-02-14 10:45:54.219226",
        "entity": null,
        "entity_guid": null,
        "cluster": null,
        "event_code": "5000100",
        "cluster_guid": null,
        "id": 2,
        "description": "User: tech, logged in successfully"
    },
    {
        "entity_details": null,
        "severity": "information",
        "classification": "activity",
        "timestamp": "2018-02-14 10:43:03.200513",
        "entity": null,
        "entity_guid": null,
        "cluster": null,
        "event_code": "5000200",
        "cluster_guid": null,
        "id": 1,
        "description": "Removed 0 old events..."
    }
],
"links": [
    {
        "href": "https://vxms-xbrickdrm1271/api/json/v3/types/events/",
        "rel": "self"
    }
]
}

```

InfiniBand Switches

Viewing the List of InfiniBand Switches

GET /api/json/v3/types/infiniband-switches

This command (GET /api/json/v3/types/infiniband-switches) displays the list of InfiniBand Switches.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example Request

```
GET /api/json/v3/types/infiniband-switches HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

InfiniBand Switches

Response

```
{
  "infiniband-switches": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/infiniband-switches/0d5a04e42b274178bcc2359c8448e00c",
      "name": "IB-SW1"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/infiniband-switches/fd033f8cf3de463cac559031badd2460",
      "name": "IB-SW2"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/infiniband-switches/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of an InfiniBand Switch

GET /api/json/v3/types/infiniband-switches/<parameter (infiniband-switch-guid or infiniband-switch-index or ?name=infiniband-switch-name)>

This command (GET /api/json/v3/types/infiniband-switches/<parameter [infiniband-switch-guid or infiniband-switch-index or ?name=infiniband-switch-name]>) displays the details of the selected InfiniBand Switch.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
infiniband-switch-guid	A unique identifier for the InfiniBand Switch.	Select one of the following: - infiniband-switch-guid - infiniband-switch-index - infiniband-switch-name
infiniband-switch-index	The index of the InfiniBand Switch.	
infiniband-switch-name	The name of the InfiniBand Switch.	
- cluster-index OR - cluster-name	The Cluster index or name of the InfiniBand Switch.	- No – for single cluster configurations or if infiniband-switch-guid is specified - Yes – for multiple cluster configurations and if the infiniband-switch-guid is not specified

InfiniBand Switches

Output Parameter	Description
enabled-state	Indicates whether the InfiniBand Switch is currently enabled or disabled, either by the user or the cluster.
fan-1-rpm	The speed of fan number 1, measured in revolutions per minute
fan-2-rpm	The speed of fan number 2, measured in revolutions per minute
fan-3-rpm	The speed of fan number 3, measured in revolutions per minute
fan-4-rpm	The speed of fan number 4, measured in revolutions per minute
fan-drawer-status	The fan drawer status, based on the speed of each fan. The fan drawer comprises of four fans. Values: • healthy • one_fan_failed • failed
fru-lifecycle-state	InfiniBand Switch's FRU state, using the generic FRU transition states Values: • healthy - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • failed - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • disconnected - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • uninitialized - An FRU that has not been initialized passes through this state before initialization. • initializing - Indicates a transient state in which the system performs initialization of a component.
fru-replace-failure-reason	Reason why the FRU replacement has failed. null means that the last FRU replacement was either not performed for this object or the replacement was successful.
fw-psid	Internal Id of the firmware
fw-version	Current firmware version of the InfiniBand Switch
fw-version-error	Used to indicate if the firmware or OS upgrade has failed or is in the process of upgrading. This reflects the aggregate of all Storage Controller OS and firmware upgrades.

InfiniBand Switches

Output Parameter	Description
hw-revision	Hardware level of the InfiniBand Switch Note: The value is not always available. GUI and CLI do not display the value when unavailable.
ib-switch-id	The Id of the InfiniBand Switch object
ib-switch-index	The InfiniBand Switch index within the system (either 1 or 2). The correct installation ensures that the lower one is connected to port 1 of each Storage Controller. The XMS assumes that the InfiniBand Switch connected to port 1 is the lower one.
identify-led	Indicates whether the identification LED is illuminated for this InfiniBand Switch. The property value is reflected in the GUI LED icon. Note: There is no identification LED in the current PSU. Values: - off - Identification LED is turned off. - blinking - Identification LED is blinking. - on - Identification LED is turned on. - na - This LED or reading of its value is not supported in the hardware.
index	InfiniBand Switch's index number as defined by the XMS upon its creation (a unique positive number)
inter-switch-ib1-port-state	The status of the first InfiniBand port used to connect to the other InfiniBand Switch
inter-switch-ib2-port-state	The status of the second InfiniBand port used to connect to the other InfiniBand Switch
is-available	InfiniBand Switch's availability status in relation to the system
model-name	Vendor-assigned InfiniBand Switch model name
name	InfiniBand Switch's name
num-of-temp-sensors	Total number of temperature sensors
num-of-voltage-sensors	Total number of voltage sensors

InfiniBand Switches

Output Parameter	Description
obj-severity	InfiniBand Switch's severity, based on severity level of current Alerts (Alerts still uncleared) for this InfiniBand Switch and its contained objects Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
part-number	Dell EMC-assigned string identifying part (SKU), independent of the actual vendor model name used for this FRU
ports	The InfiniBand Switch ports connecting to the Storage Controllers
ports-num	Total number of ports in the InfiniBand Switch
serial-number	InfiniBand Switch's serial number
status-led	LED state indicating InfiniBand Switch's object faults
sys-id	For the cluster to which this InfiniBand Switch belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
tag-list	List of Tags
temp-sensors-array	An array containing information about the five temperature sensors of the InfiniBand Switch
voltage-sensors-array	An array containing information about the six voltage sensors of the InfiniBand Switch PSUs
wrong-sc-connection-detected	Denotes if at least one Storage Controller is not connected to the corresponding InfiniBand Switch port.
xms-id	For the XMS to which this InfiniBand Switch belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/infiniband-switches/0d5a04e42b274178bcc2359c8448e00c
HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

InfiniBand Switches

Response

```
{
  "content": {
    "fan-module3-status": "healthy",
    "fru-lifecycle-state": "healthy",
    "fan-module3-hardware-label": "Fan3",
    "voltage-sensors-array": [
      [
        "Voltage Sensor[0]",
        2.1700000763
      ],
      [
        "Voltage Sensor[1]",
        0.9200000167
      ],
      [
        "Voltage Sensor[2]",
        3.2799999714
      ],
      [
        "Voltage Sensor[3]",
        1.7699999809
      ],
      [
        "Voltage Sensor[4]",
        1.1799999475
      ],
      [
        "Voltage Sensor[5]",
        11.89000003433
      ]
    ],
    "fan-drawer-status": "not_available",
    "obj-severity": "information",
    "fan-module1-status": "healthy",
    "fan-module1-hardware-label": "Fan1",
    "fan-module4-hardware-label": "Fan4",
    "serial-number": "MT1603X12680",
    "is-available": 1,
    "location-index": 1,
    "fru-replace-failure-reason": "",
    "guid": "0d5a04e42b274178bcc2359c8448e00c",
    "ib-switch-id": [
      "0d5a04e42b274178bcc2359c8448e00c",
      "IB-SW1",
      1
    ],
    "fan-module2-hardware-label": "Fan2",
    "index": 1,
    "hardware-label": "IBSW1",
    "fan-1-rpm": 13020,
    "ports-num": 12,
    "fan-8-rpm": 0,
    "fw-version-error": "no_error",
    "fan-3-rpm": 12210,
  }
}
```

```

"fan-module2-status": "healthy",
"fan-module4-status": "healthy",
"fan-2-rpm": 13020,
"fan-5-rpm": 0,
"fan-fru-replace-supported": "false",
"hw-revision": "0x00a2",
"num-of-voltage-sensors": 6,
"xms-id": [
  "7c1f6664959e4234b4cba5e198f4ced3",
  "xms",
  1
],
"fan-4-rpm": 12210,
"num-of-temp-sensors": 5,
"fw-psid": "EMC1260110021",
"inter-switch-ib1-port-state": "active",
"tag-list": [],
"identify-led": "na",
"fw-version": "09.03.8000",
"sys-name": "xbrick804-805",
"fan-7-rpm": 0,
"part-number": "100-586-412-00",
"sys-id": [
  "177584543e5942e4957a709584d1cc2d",
  "xbrick804-805",
  2
],
"name": "IB-SW1",
"ib-switch-index": 1,
"sys-index": 2,
"fan-6-rpm": 0,
"status-led": "na",
"temp-sensors-array": [
  [
    "Temperature Sensor[0]",
    35
  ],
  [
    "Temperature Sensor[1]",
    27
  ],
  [
    "Temperature Sensor[2]",
    26
  ],
  [
    "Temperature Sensor[3]",
    24
  ],
  [
    "Temperature Sensor[4]",
    28
  ]
],
"enabled-state": "enabled",
"inter-switch-ib2-port-state": "active",
"ports-health-state.port-health-state": null,
"ports-enabled-state.port-enabled-state": null,
"model-name": "dingo",

```

InfiniBand Switches

[illegible]

```

    0,
    0,
    0,
    0
  ],
  [
    4,
    56,
    "up",
    [],
    "Storagecontroller",
    1,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0
  ],
  [
    5,
    56,
    "up",
    [],
    "Storagecontroller",
    1,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0
  ],
  [
    6,
    56,
    "up",
    [],
    "Storagecontroller",
    1,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0
  ]
]
```

InfiniBand Switches

```
0,
0,
0,
0,
0
],
[
7,
0,
"down",
[],
"None",
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0
],
[
8,
0,
"down",
[],
"None",
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0
],
[
9,
0,
"down",
[],
"None",
0,
0,
0,
0,
0,
```

```
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
],
[
10,
0,
"down",
[],
"None",
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
],
[
11,
0,
"down",
[],
"None",
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
0,
],
[
12,
0,
"down",
[],
"None",
0,
0,
0,
0,
```

InfiniBand Switches

```

        0,
        0,
        0,
        0,
        0,
        0,
        0,
        0,
        0,
        0
    ]
},
"wrong-sc-connection-detected": "none"
},
"links": [
    {
        "guid": "0d5a04e42b274178bcc2359c8448e00c",
        "href": "https://vxms-xbrickdrm919/api/json/v3/types/infiniband-
switches/0d5a04e42b274178bcc2359c8448e00c",
        "rel": "self"
    }
]
}

```


Initiators

Viewing the List of Initiators

GET /api/json/v3/types/initiators

This command (GET /api/json/v3/types/initiators) displays the list of all Initiators and their defined parameters.

Example Request

```
GET /api/json/v3/types/initiators HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Initiators

Response

```

{
  "initiators": [
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/initiators/b9ad6285ae0c4d82bcd8390f54014292",
      "name": "lgdrm3303-p1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/initiators/0ebaf6912fca4ac696085e50966a3ddc",
      "name": "lg987-fc1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/initiators/7fc799007d134250ad0b62ba479655ca",
      "name": "lg987-fc2",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/initiators/a6270a2efc664a63836d9dcc776ed48f",
      "name": "lgdrm3303-p2",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/initiators/a57fba183d764520855491a19c49114b",
      "name": "lg987-iscsi1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/initiators/d09b77fd1d9e4fba89f7ac48d418eb6e",
      "name": "10:00:00:90:fa:ab:4e:9c",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/initiators/6acec662d88a474081f4a17f2fc2f639",
      "name": "10:00:00:90:fa:ab:4e:9d",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiators/",
      "rel": "self"
    }
  ]
}

```

Initiators

Initiators

Viewing the Details of an Initiator

GET /api/json/v3/types/initiators/<parameter (initiator-guid or initiator-index or ?name=initiator-name)>

This command (GET /api/json/v3/types/initiators/<parameter [initiator-guid or initiator-index or ?name=initiator-name]>) displays details of the selected Initiator.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
initiator-guid	A unique identifier for the Initiator.	Select one of the following: - initiator-guid - initiator-index - initiator-name
initiator-index	The index of the Initiator.	
Initiator-name	The name of the Initiator.	
- cluster-index OR - cluster-name	The Cluster index or name of the Initiator.	- No – for single cluster configurations or if initiator-guid is specified - Yes – for multiple cluster configurations and if the initiator-guid is not specified

Output Parameter	Description
acc-num-of-rd	Initiator's total lifespan cumulative read I/Os
acc-num-of-small-rd	Accumulated number of small reads input/output operations for the Initiator
acc-num-of-small-wr	Accumulated number of small writes input/output operations recursively contained by this Initiator
acc-num-of-unaligned-rd	Accumulated number of unaligned reads for input/output operations recursively contained by this Initiator
acc-num-of-unaligned-wr	Accumulated number of unaligned writes input/output operations recursively contained by this Initiator

Initiators

Output Parameter	Description
acc-num-of-wr	Accumulative number of write operations having occurred during the Initiator's lifespan
acc-size-of-rd	Accumulative capacity KB size of read operations having occurred during the Initiator's lifespan
acc-size-of-wr	Accumulative capacity KB size of write operations having occurred during the Initiator's lifespan
avg-latency	Real-time average latency of read and write operations, measured in μ s
bw	Total read and write bandwidth in MB per second
certainty	XMS certainty. Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
chap-authentication-cluster-password	The credentials used by the cluster towards this specific Initiator. Both username and password are mandatory when chap_authentication_mode is not disabled. Always shown as null
chap-authentication-cluster-user-name	- Username by which the cluster identifies itself to any Initiator during the initial connection of the Initiator to the target. - Valid only if chap-discovery-mode = initiator-and-target. - Applicable for iSCSI only.
chap-authentication-initiator-password	The credentials used by this specific Initiator. Both username and password are mandatory when chap_authentication_mode is not disabled. Always shown as null
chap-authentication-initiator-user-name	- Username by which the Initiator is identified when connecting to the Target - Valid for iSCSI ports when chap-authentication-mode is not disabled
chap-discovery-cluster-password	Password by which the cluster identifies itself to any Initiator during the discovery phase. Always shown as null
chap-discovery-cluster-user-name	- Username by which the cluster identifies itself to any Initiator during discovery phase - Valid only if chap_discovery_mode = initiator_and_target - Applicable for iSCSI only
chap-discovery-initiator-password	Password by which any Initiator is identified during the discovery phase (at least 12 characters). Always shown as null

Initiators

Output Parameter	Description
chap-discovery-initiator-user-name	- Username by which an Initiator is identified during the discovery phase - Valid for iSCSI ports only when chap-discovery-mode is not disabled
ig-id	For the Initiator Group to which this Initiator belongs, a tuple array containing the following parameters (in the following order): the Initiator Group's object GUID identifier, the Initiator Group name, and the Initiator Group index.
ig-index	The Initiator Group's index number.
ig-name	The Initiator Group's name.
index	Initiator's index number as defined by the XMS upon its creation (a unique positive number)
initiator-conn-state	Indicates whether the Initiator is currently connected to the cluster via at least one target port.
initiator-id	For this Initiator, a tuple array containing the following parameters (in the following order): the Initiator's object GUID identifier, the Initiator name, and the Initiator index.
iops	Initiator's total read and write real-time input/output operations per second
name	Initiator's name as defined by the user when creating the Initiator
num-of-conn-tars	List containing the Target Object IDs via which the Initiator is currently connected to the cluster
obj-severity	Initiator's severity, based on severity level of current Alerts (Alerts still uncleared) for this Initiator Values: - clear - No Alerts exist for this entity. - information - The highest severity for this entity and all contained objects is information. - minor - The highest severity for this entity and all contained objects is minor. - major - The highest severity for this entity and all contained objects is major. - critical - The highest severity for this entity and all contained objects is critical.
operating-system	Operating System (e.g. Linux, Windows, ESX, Solaris, AIX, HP-UX)
path-redundancy-non-redundant-volume-list	An array containing a list of non redundant Volumes through which this Initiator has a path or paths

Output Parameter	Description
path-redundancy-state	Indicates whether this Initiator has at least two paths to all Volumes through Targets on different Storage Controllers. Values: - uninitialized – The path redundancy of the Initiator is uninitialized, indicating the Initiator is either not mapped or physically disconnected. - redundant - All Volumes have at least two paths through Targets on different Storage Controllers. - non_redundant - A lack of redundancy from the Initiator to at least one Volume. - no_active_path – The Initiator does not have an active path to all its mapped Volumes. - degraded_no_active – The path redundancy state was degraded to no_active_path towards at least one Volume, during an operating system upgrade, indicating all paths are not active. This value can be set only during a FW upgrade. - degraded_non_redundant – The path redundancy state was degraded to non_redundant towards at least one Volume, during an OS upgrade. This value can be set only during an OS upgrade. - degraded_disconnected - The path redundancy state was degraded to disconnected, indicating no path from this Initiator. This value can be set only during a FW upgrade. - monitor_disabled - Monitoring and analysis for this Initiator is disabled.
port-address	The following input format variations are accepted for Fibre Channel Initiators ("X" is a hexadecimal digit – upper case or lower case are allowed): "XX:XX:XX:XX:XX:XX:XX" "XXXXXXXXXXXXXXXXXX" "0XXXXXXXXXXXXXXXXX" When the Initiator object port-address parameter is queried, the value is always returned in a single output format. IQN and EUI formats are allowed for iSCSI Initiators.
port-type	Port type (Fibre Channel or iSCSI)
rd-bw	Total read bandwidth in MB per second
rd-iops	Total read real-time input/output operations per second
rd-latency	Real-time average latency of read operations, measured in μ s
small-bw	Current bandwidth of small input/output operations, addressed at the Initiator
small-iops	Current IOPS of small input/output operations, addressed at the Initiator

Initiators

Output Parameter	Description
small-rd-bw	Current bandwidth of small input/output operations, addressed at the Initiator
small-rd-iops	Current IOPS of small read input/output operations, addressed at the Initiator
small-wr-bw	Current bandwidth of small write input/output operations, addressed at the Initiator
small-wr-iops	Current IOPS of small write input/output operations, addressed at the Initiator
sys-id	For the cluster to which this Initiator belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags
unaligned-bw	Current bandwidth of unaligned input/output operations, addressed at the Initiator
unaligned-iops	Current IOPS of unaligned input/output operations, addressed at the Initiator
unaligned-rd-bw	Current bandwidth of unaligned read input/output operations, addressed at the Initiator
unaligned-rd-iops	Current IOPS of unaligned read input/output operations, addressed at the Initiator
unaligned-wr-bw	Current bandwidth of unaligned write input/output operations, addressed at the Initiator
unaligned-wr-iops	Current IOPS of unaligned write input/output operations, addressed at the Initiator
wr-bw	Total write bandwidth in MB per second
wr-iops	Total write real-time input/output operations per second
wr-latency	Real-time average latency of write operations, measured in μ s
xms-id	For the XMS to which this Initiator belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/initiators/35947ecd68504843974b12caaf5d3ff3 HTTP/1.1
```


Initiators

Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Initiators

Response

```
{
  "content": {
    "small-iops": "0",
    "wr-latency": "0",
    "chap-discovery-initiator-password": "",
    "obj-severity": "information",
    "rd-bw": "0",
    "unaligned-rd-bw": "0",
    "acc-num-of-wr": "0",
    "path-redundancy-non-redundant-volume-list": null,
    "sys-index": 2,
    "chap-discovery-cluster-user-name": "",
    "iops": "0",
    "operating-system": "windows",
    "num-of-conn-tars": 4,
    "port-type": "fc",
    "acc-num-of-small-wr": "0",
    "guid": "35947ecd68504843974b12caaf5d3ff3",
    "chap-authentication-initiator-password": "",
    "acc-num-of-rd": "0",
    "index": 1,
    "port-address": "21:00:00:24:ff:56:0f:55",
    "ig-index": 1,
    "chap-authentication-initiator-user-name": "",
    "ig-id": [
      "a6a1871fc805478081fb5b28c7e3f2a9",
      "X1IG",
      1
    ],
    "acc-size-of-wr": "0",
    "acc-num-of-small-rd": "0",
    "unaligned-rd-iops": "0",
    "chap-discovery-cluster-password": "",
    "chap-authentication-cluster-password": "",
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "unaligned-wr-bw": "0",
    "acc-num-of-unaligned-rd": "0",
    "small-wr-bw": "0",
    "tag-list": [],
    "unaligned-iops": "0",
    "unaligned-bw": "0",
    "bw": "0",
    "sys-name": "xbrickdrm847",
    "ig-name": "X1IG",
    "wr-iops": "0",
    "sys-id": [
      "3139f69b7b0e4b21a013bf1c45d4fb00",
      "xbrickdrm847",
      2
    ],
  ],
}
```

```

    "avg-latency": "0",
    "name": "X1IG-fc-2",
    "small-wr-iops": "0",
    "chap-authentication-cluster-user-name": "",
    "rd-latency": "0",
    "acc-num-of-unaligned-wr": "0",
    "certainty": "ok",
    "chap-discovery-initiator-user-name": "",
    "initiator-id": [
      "35947ecd68504843974b12caaf5d3ff3",
      "X1IG-fc-2",
      1
    ],
    "acc-size-of-rd": "0",
    "unaligned-wr-iops": "0",
    "small-rd-iops": "0",
    "small-rd-bw": "0",
    "initiator-conn-state": "connected",
    "rd-iops": "0",
    "wr-bw": "0",
    "path-redundancy-state": null,
    "small-bw": "0"
  },
  "links": [
    {
      "guid": "35947ecd68504843974b12caaf5d3ff3",
      "href": "https://vxms-
xbrickdrm919/api/json/v3/types/initiators/35947ecd68504843974b12caaf5d3ff3",
      "rel": "self"
    }
  ]
}

```

Initiators

Adding an Initiator

POST /api/json/v3/types/initiators

This command (POST /api/json/v3/types/initiators) enables you to add a new Initiator and associate it with an existing Initiator Group.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
ig-id	Initiator Group's name or index number	Yes
port-address	Initiator's port address The following rules apply: - For FC Initiators, any of the following formats are accepted ('X' is a hexadecimal digit – upper case and lower case are allowed): - XX:XX:XX:XX:XX:XX:XX:XX - XXXXXXXXXXXXXXXXXX 0XXXXXXXXXXXXXXXXXX - For iSCSI Initiators, IQN and EUI formats are accepted. - Two Initiators cannot share the same port address. You cannot specify an FC address for an iSCSI Target and vice-versa.	Yes
cluster-authentication-password	CHAP authentication cluster password	No
cluster-authentication-user-name	CHAP authentication cluster username	No
cluster-discovery-password	CHAP discovery cluster password	No
cluster-discovery-user-name	CHAP discovery cluster username	No

Initiators

Input Parameter	Description	Mandatory
initiator-authentication-password	CHAP authentication password	No
initiator-authentication-user-name	CHAP authentication username	No
initiator-discovery-password	CHAP discovery password	No
initiator-discovery-user-name	CHAP discovery Initiator username	No
initiator-name	Initiator name	No
operating-system	Operating System (e.g. Linux, Windows, ESX, Solaris, AIX, HP-UX) Note: If the existing Initiator-Group contains a specified operating system, the Initiator operating system must match the Initiator-Group.	No

Example Request

POST /api/json/v3/types/initiators HTTP/1.1

Host: vxms-xbrick919.xiodrm.lab.emc.com

Authorization: Basic *****

Cache-Control: no-cache

```
{ "cluster-id": "xbrickdrm1648", "ig-id": "lgdrm3293", "initiator-name": "lg09999-fc050", "port-address": "50:01:43:80:24:21:df:ab" }
```

Response

```
{
  "links": [
    {
      "guid": "01b217344e8049859406fee4f4d307aa",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/initiators/01b217344e8049859406fee4f4d307aa",
      "rel": "self"
    }
  ]
}
```

Initiators

Modifying an Initiator

PUT /api/json/v3/types/initiators/<parameter (initiator-guid or initiator-index or ?name=initiator-name)>

This command (PUT /api/json/v3/types/initiators/<parameter [initiator-guid or initiator-index or ?name=initiator-name]>) enables you to modify an Initiator.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
initiator-guid	A unique identifier for the Initiator.	Select one of the following: - initiator-guid - initiator-index - initiator-name
initiator-index	The index of the Initiator.	
Initiator-name	The name of the Initiator.	
- cluster-index OR - cluster-name	The Cluster index or name of the Initiator.	- No – for single cluster configurations or if initiator-guid is specified - Yes – for multiple cluster configurations and if the initiator-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-authentication-user-name	CHAP authentication cluster username	Select one of the following: - cluster-authentication-user-name - initiator-authentication-user-name - initiator-authentication-password - initiator-discovery-password - cluster-authentication-password - cluster-discovery-user-name - cluster-discovery-password - operating-system
cluster-discovery-password	CHAP discovery cluster password	
cluster-discovery-user-name	CHAP discovery cluster username	
cluster-authentication-password	CHAP authentication cluster password	
initiator-authentication-password	CHAP authentication password	
initiator-authentication-user-name	CHAP authentication username	
initiator-discovery-password	CHAP discovery password	
initiator-discovery-user-name	CHAP discovery Initiator username	
initiator-name	Initiator name	
operating-system	Operating System (e.g. Linux, Windows, ESX, Solaris, AIX, HP-UX)	
port-address	Initiator's port address The following rules apply: - For FC Initiators, any of the following formats are accepted ('X' is a hexadecimal digit – upper case and lower case are allowed): - XX:XX:XX:XX:XX:XX:XX:XX - XXXXXXXXXXXXXXXXXX 0XXXXXXXXXXXXXXXXXX - For iSCSI Initiators, IQN and EUI formats are accepted. - Two Initiators cannot share the same port address. You cannot specify an FC address for an iSCSI Target and vice-versa.	Select one of the following: - port-address - remove-cluster-authentication-credentials - remove-cluster-discovery-credentials - remove-initiator-authentication-

Initiators

Input Parameter	Description	Mandatory
remove-cluster-authentication-credentials	Removes CHAP cluster authentication credentials.	- credentials - remove-initiator-discovery-credentials
remove-cluster-discovery-credentials	Removes CHAP cluster discovery credentials.	
remove-initiator-authentication-credentials	Removes CHAP Initiator authentication credentials.	
remove-initiator-discovery-credentials	Removes CHAP Initiator discovery credentials.	

Example Request

```
PUT /api/json/v3/types/initiators/01b217344e8049859406fee4f4d307aa HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic b3BlcmF0aw9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

```
{"initiator-name":"new.lg09999-fc050"}
```

Response

Note: The successful completion of this command returns no response.

Removing an Initiator

DELETE /api/json/v3/types/initiators/<parameter (initiator-guid or initiator-index or ?name=initiator-name)>

This command (DELETE /api/json/v3/types/initiators/<parameter [initiator-guid or initiator-index or ?name=initiator-name]>) enables you to remove an Initiator.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
initiator-guid	A unique identifier for the Initiator.	Select one of the following:
initiator-index	The index of the Initiator.	

Initiators

Input Parameter	Description	Mandatory
Initiator-name	The name of the Initiator.	- initiator-guid - initiator-index - initiator-name
- cluster-index OR - cluster-name	The Cluster index or name of the Initiator.	- No – for single cluster configurations or if initiator-guid is specified - Yes – for multiple cluster configurations and if the initiator-guid is not specified

Example Request

```
DELETE /api/json/v3/types/initiators/01b217344e8049859406fee4f4d307aa HTTP/1.1
Host: vxms-xbrick238:42503
Authorization: Basic b3BlcmF0aw9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Initiators Connectivity

Viewing the List of Initiators' Connectivity

GET /api/json/v3/types/initiators-connectivity

This command (GET /api/json/v3/types/initiators-connectivity) displays a list of all initiators' connectivity.

Output Parameter	Description
index	Initiator's index number as defined by the XMS upon its creation (a unique positive number)
name	Initiator's name as defined by the user when creating the Initiator
num-of-conn-tars	The number of target ports that detects this Initiator
port-address	The following input format variations are accepted for Fibre Channel Initiators ("X" is a hexadecimal digit – upper case or lower case are allowed): "XX:XX:XX:XX:XX:XX:XX" "XXXXXXXXXXXXXXXXXX" "0XXXXXXXXXXXXXXXXX" When the Initiator object port-address parameter is queried, the value is always returned in a single output format. IQN and EUI formats are allowed for iSCSI Initiators.
port-type	Port type (Fibre Channel or iSCSI)
sys-id	For the cluster to which this Initiator belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
target-list	A list of all target ports (separated by a comma) that "discovered" this Initiator.

Example Request

```
GET /api/json/v3/types/initiators-connectivity HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Initiators Connectivity

```

{
  "content": [
    {
      "index": 3,
      "port-address": "10:00:00:90:fa:a6:e2:24",
      "name": "lgdrm3294-p1",
      "target-list": [
        [
          "6a3fa4d7407a4f839347282d6fff8a22",
          "X1-SC1-target3",
          3
        ],
        [
          "7bf8fe8347bd43d08793839ea7d0e9e6",
          "X1-SC1-target4",
          4
        ],
        [
          "33d7a48827b4401e99e11a79f3d1133d",
          "X1-SC2-target3",
          8
        ]
      ],
      "num-of-conn-tars": 3,
      "sys-id": [
        "44fe6e8c38ee4be29ef24026d0d474b8",
        "xbrickdrm1648",
        1
      ],
      "port-type": "fc"
    },
    {
      "index": 4,
      "port-address": "10:00:00:90:fa:a6:e2:25",
      "name": "lgdrm3294-p2",
      "target-list": [
        [
          "6a3fa4d7407a4f839347282d6fff8a22",
          "X1-SC1-target3",
          3
        ],
        [
          "7bf8fe8347bd43d08793839ea7d0e9e6",
          "X1-SC1-target4",
          4
        ],
        [
          "33d7a48827b4401e99e11a79f3d1133d",
          "X1-SC2-target3",
          8
        ],
        [
          "2ee6b3721d184acc9681d4e49a58f220",
          "X1-SC2-target4",
          9
        ]
      ],
    },
  ],
}

```

```

        "num-of-conn-tars": 4,
        "sys-id": [
            "44fe6e8c38ee4be29ef24026d0d474b8",
            "xbrickdrm1648",
            1
        ],
        "port-type": "fc"
    },
    {
        "index": 1,
        "port-address": "20:01:00:0e:1e:c3:cc:5c",
        "name": "lgdrm3293-p1",
        "target-list": [
            [
                "6a3fa4d7407a4f839347282d6fff8a22",
                "X1-SC1-target3",
                3
            ],
            [
                "7bf8fe8347bd43d08793839ea7d0e9e6",
                "X1-SC1-target4",
                4
            ],
            [
                "33d7a48827b4401e99e11a79f3d1133d",
                "X1-SC2-target3",
                8
            ],
            [
                "2ee6b3721d184acc9681d4e49a58f220",
                "X1-SC2-target4",
                9
            ]
        ],
        "num-of-conn-tars": 4,
        "sys-id": [
            "44fe6e8c38ee4be29ef24026d0d474b8",
            "xbrickdrm1648",
            1
        ],
        "port-type": "fc"
    },
    {
        "index": 2,
        "port-address": "20:01:00:0e:1e:c3:cc:5d",
        "name": "lgdrm3293-p2",
        "target-list": [
            [
                "6a3fa4d7407a4f839347282d6fff8a22",
                "X1-SC1-target3",
                3
            ],
            [
                "7bf8fe8347bd43d08793839ea7d0e9e6",
                "X1-SC1-target4",
                4
            ],
            [
                "33d7a48827b4401e99e11a79f3d1133d",

```

Initiators Connectivity

```

        "X1-SC2-target3",
        8
      ],
      [
        "2ee6b3721d184acc9681d4e49a58f220",
        "X1-SC2-target4",
        9
      ]
    ],
    "num-of-conn-tars": 4,
    "sys-id": [
      "44fe6e8c38ee4be29ef24026d0d474b8",
      "xbrickdrm1648",
      1
    ],
    "port-type": "fc"
  }
],
"links": [
  {
    "href": "https://vxms-xbrickdrm1648/api/json/v3/types/initiators-
connectivity/",
    "rel": "self"
  }
]
}

```

Initiator Groups

Viewing the List of Initiator Groups

GET /api/json/v3/types/initiator-groups

This command (GET /api/json/v3/types/initiator-groups) displays the list of all Initiator Groups.

Example Request

```
GET /api/json/v3/types/initiator-groups HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Initiator Groups

Response

```
{
  "initiator-groups": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiator-
groups/27c3dbd5cb554e60924a4965331e840c",
      "name": "lg987",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiator-
groups/6f7498af6db64cf69b919baa2d00774c",
      "name": "lgdrm3303",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiator-
groups/43f704ca0b06411094f8d043d4ba04a2",
      "name": "lgdrm3304",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiator-
groups/f1e1667cec5f41fd9a8bbcd698616724",
      "name": "IG-new",
      "sys-name": "xbrickdrm1652"
    },
    ...
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiator-
groups/d033a67af73a4c1ea68c5be2f4f1e86d",
      "name": "host01",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiator-
groups/",
      "rel": "self"
    }
  ]
}
```


Viewing the Details of an Initiator Group

GET /api/json/v3/types/initiator-groups/<parameter (ini-grp-guid or ini-grp-index or ?name=ini-grp-name)>

This command (GET /api/json/v3/types/initiator-groups/<parameter [ini-grp-guid or ini-grp-index or ?name=ini-grp-name]>) displays the name and index number of the selected Initiator Group.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ini-grp-guid	A unique identifier for the Initiator Group.	Select one of the following:
ini-grp-index	The index of the Initiator Group.	
ini-grp-name	The name of the Initiator Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Initiator Group.	- No – for single cluster configurations or if ini-grp-guid is specified - Yes – for multiple cluster configurations and if the ini-grp-guid is not specified

Output Parameter	Description
acc-num-of-rd	Total accumulative number of read operations having occurred during the Initiator Group's lifespan
acc-num-of-small-rd	Accumulated number of small reads input/output operations for the Initiator Group
acc-num-of-small-wr	Accumulated number of small write input/output operations that are recursively contained by this Initiator Group
acc-num-of-unaligned-rd	Accumulated number of unaligned reads for input/output operations that are recursively contained by this Initiator Group
acc-num-of-unaligned-wr	Accumulated number of unaligned writes for input/output operations recursively contained by this Initiator Group

Initiator Groups

Output Parameter	Description
acc-num-of-wr	Accumulative number of write operations having occurred during the Initiator Group's lifespan
acc-size-of-rd	Accumulative capacity KB size of read operations having occurred during the Initiator Group's lifespan
acc-size-of-wr	Accumulative capacity KB size of write operations having occurred during the Initiator Group's lifespan
bw	Total read and write bandwidth in MB per second
certainty	Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may including the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath.. Note: This is a Volume property associated with each Volume associated with the Initiator Group.
guid	A unique identifier for the Initiator Group.
ig-id	For this Initiator Group, a tuple array containing the following parameters (in the following order): the Initiator Group's object GUID identifier, the Initiator Group name, and the Initiator Group index.
index	Initiator Group's index number as defined by the XMS upon its creation (a unique positive number)
iops	Initiator Group's total read and write real-time input/output operations per second
name	Initiator Group's name as defined by the user when creating the group
num-of-conn-tars	The number of target ports through which the initiator is currently connected. Notes: • The value is 0 if Initiator Connection state is disconnected. • The Query Initiator Connectivity command can be used to retrieve the identity of the target objects through which the initiator is currently connected.
num-of-initiators	Number of Initiators belonging to this Initiator Group
num-of-vols	Number of Volumes in the Initiator Group

Initiator Groups

Output Parameter	Description
obj-severity	Initiator Group's severity, based on severity level of current Alerts (Alerts still uncleared) for this Initiator Group Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
qos-effective-bw	The effective bandwidth of the QoS Policy specified by qos-policy-id for this Initiator-Group.
qos-effective-max-bw	The effective maximum bandwidth which depends upon the limit-type of the QoS Policy specified by qos-policy-id for this Initiator-Group as follows: • <code>fixed</code> – if the limit-type is <code>fixed</code>, then the effective maximum bandwidth is the QoS Policy's max-bw (if max-bw is specified), or the QoS Policy's max-iops multiplied by the io-size (if max-iops is specified). • <code>adaptive</code> – if the limit-type is <code>adaptive</code>, then the effective maximum bandwidth is the total size of Volumes in this Initiator-Group multiplied by the QoS Policy's io-size.
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Initiator-Group: Values: • <code>disabled</code> – the QoS Policy is not enforced • <code>enabled</code> – the QoS Policy is enforced • <code>monitor_only</code> – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected.
qos-exceeded-bw	The bandwidth of IOs exceeding the QoS Policy specified by qos-policy-id. If the qos-enabled-mode is enabled, then these IOs were rejected.
qos-exceeded-iops	The number of IOPS rejected for exceeding the QoS Policy specified by qos-policy-id
qos-implicit-obj-list	A list of objects associated with the QoS Policy specified by qos-policy-id and this Initiator-Group.
qos-policy-id	For the QoS Policy associated with this Initiator-Group, a tuple array containing the following parameters (in the following order): the QoS Policy object GUID identifier, the QoS Policy name, and the QoS Policy index.

Initiator Groups

Output Parameter	Description
rd-bw	Total real-time read bandwidth in MB per second
rd-iops	Total read real-time input/output operations per second
small-bw	Current bandwidth of small input/output operations, addressed at the Initiator Group
small-iops	Current IOPS of small input/output operations, addressed at the Initiator Group
small-rd-bw	Current bandwidth of small input/output operations, addressed at the Initiator Group
small-rd-iops	Current IOPS of small read input/output operations, addressed at the Initiator Group
small-wr-bw	Current bandwidth of small write input/output operations, addressed at the Initiator Group
small-wr-iops	Current IOPS of small write input/output operations, addressed at the Initiator Group
sys-id	For the cluster to which this Initiator-Group belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	Initiator Group's list of Tags
unaligned-bw	Current bandwidth of unaligned input/output operations, addressed at the Initiator Group
unaligned-iops	Current IOPS of unaligned input/output operations, addressed at the Initiator Group
unaligned-rd-bw	Current bandwidth of unaligned input/output operations
unaligned-rd-iops	Current IOPS of unaligned read input/output operations, addressed at the Initiator Group
unaligned-wr-bw	Current bandwidth of unaligned write input/output operations, addressed at the Initiator Group
unaligned-wr-iops	Current IOPS of unaligned write input/output operations, addressed at the Initiator Group
wr-bw	Total write bandwidth in MB per second
wr-iops	Total write real-time input/output operations per second

Output Parameter	Description
xms-id	For the XMS to which this Initiator Group belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

GET /api/json/v3/types/initiator-groups/d54a5cf4766e476ba4ce61903a444499
HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Initiator Groups

Response

```
{
  "content": {
    "small-iops": "0",
    "num-of-initiators": 1,
    "obj-severity": "information",
    "rd-bw": 0.0,
    "unaligned-rd-bw": 0.0,
    "sys-index": 1,
    "iops": 0.0,
    "num-of-conn-tars": 0,
    "acc-num-of-small-wr": 0.0,
    "guid": "d54a5cf4766e476ba4ce61903a444499",
    "qos-exceeded-iops": null,
    "acc-num-of-rd": 0.0,
    "index": 8,
    "small-rd-bw": 0.0,
    "qos-enabled-mode": "enabled",
    "ig-id": [
      "d54a5cf4766e476ba4ce61903a444499",
      "TW-IG-03",
      8
    ],
    "created-by-external-client": "",
    "acc-size-of-wr": 0.0,
    "acc-num-of-small-rd": 0.0,
    "unaligned-rd-iops": 0.0,
    "num-of-vols": 3,
    "xms-id": [
      "76aab098d95a48beafd5a6b75c8a2ec5",
      "xms",
      1
    ],
    "qos-exceeded-bw": null,
    "unaligned-wr-bw": 0.0,
    "acc-num-of-unaligned-rd": 0.0,
    "small-wr-bw": 0.0,
    "unaligned-iops": "0",
    "tag-list": [],
    "unaligned-bw": "0",
    "bw": 0.0,
    "sys-name": "xbrickdrm1652",
    "wr-iops": 0.0,
    "qos-implicit-obj-list": [
      [
        "8c82265b3f394e55951f1b23f97b5cc1",
        "TW-CG-3000",
        20
      ],
      [
        "8c82265b3f394e55951f1b23f97b5cc1",
        "TW-CG-3000",
        20
      ]
    ]
  }
}
```

```

        "8c82265b3f394e55951f1b23f97b5cc1",
        "TW-CG-3000",
        20
    ],
    ],
    "sys-id": [
        "4b7891fe67be4c00b7c9c194c54150eb",
        "xbrickdrm1652",
        1
    ],
    "name": "TW-IG-03",
    "small-wr-iops": 0.0,
    "rd-iops": 0.0,
    "qos-policy-id": [],
    "acc-num-of-unaligned-wr": 0.0,
    "certainty": "ok",
    "acc-num-of-wr": 0.0,
    "acc-size-of-rd": 0.0,
    "unaligned-wr-iops": 0.0,
    "small-rd-iops": 0.0,
    "qos-effective-burst-bw": null,
    "qos-effective-max-bw": null,
    "small-bw": "0",
    "wr-bw": 0.0
},
"links": [
    {
        "guid": "d54a5cf4766e476ba4ce61903a444499",
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiator-
groups/d54a5cf4766e476ba4ce61903a444499",
        "rel": "self"
    }
]
}

```

Initiator Groups

Adding an Initiator Group

POST /api/json/v3/types/initiator-groups

This command (POST /api/json/v3/types/initiator-groups) enables you to add an Initiator Group and its Initiators to the XtremIO cluster.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
ig-name	Initiator Group's name	Yes
initiator-list	List of associated Initiators (name and port number)	No
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Initiator-Group: Values: - disabled – the QoS Policy is not enforced - enabled – the QoS Policy is enforced - monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected. The default value is enabled.	No
qos-policy-id	The Id of the QoS Policy object to associate with this Consistency Group.	No
tag-list	Tag Id list	No

Example Request

```
POST /api/json/v3/types/initiator-groups HTTP/1.1
Host: vxms-xbrick919.xiolab.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"cluster-id":"xbrickdrm1652","ig-name":"TW-IG-B-01","qos-policy-id":1,"qos-enabled-mode":"enabled"}
```

Response

```
{
  "links": [
    {
      "guid": "ebd59c41cb98491d91ebe5d5c97a1e9b",
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/initiator-groups/ebd59c41cb98491d91ebe5d5c97a1e9b",
      "rel": "self"
    }
  ]
}
```

Initiator Groups

Modifying an Initiator Group

PUT /api/json/v3/types/initiator-groups/<parameter (ini-grp-guid or ini-grp-index or ?name=ini-grp-name)>

This command (PUT /api/json/v3/types/initiator-groups/<parameter [ini-grp-guid or ini-grp-index or ?name=ini-grp-name]>) enables you to rename or modify the operating system of an Initiator Group.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ini-grp-guid	A unique identifier for the Initiator Group.	Select one of the following: - ini-grp-guid - ini-grp-index - ini-grp-name
ini-grp-index	The index of the Initiator Group.	
ini-grp-name	The name of the Initiator Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Initiator Group.	- No – for single cluster configurations or if ini-grp-guid is specified - Yes – for multiple cluster configurations and if the ini-grp-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
new-name	Initiator Group's new name	Select at least one of the following: new-name
operating-system	Operating System (e.g. Linux, Windows, ESX, Solaris, AIX, HP-UX)	

Initiator Groups

Input Parameter	Description	Mandatory
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Initiator-Group: Values: - disabled – the QoS Policy is not enforced - enabled – the QoS Policy is enforced - monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected. The default value is enabled.	- operating-system - qos-enabled-mode - qos-policy-id - remove-qos-policy But not both of the following:
qos-policy-id	The Id of the QoS Policy object to associate with this Consistency Group. Note: If qos-policy-id is specified, remove-qos-policy cannot be specified.	- qos-policy-id - remove-qos-policy
remove-qos-policy	Indicates whether to remove the associated QoS Policy. Note: If remove-qos-policy is specified, qos-policy-id cannot be specified.	

Note: A cluster can also be defined as `cluster-name` or `cluster-index` in the URL, however the cluster definition should only be entered in one location, either the URL or the body.

Example Request

```
PUT /api/json/v3/types/initiator-groups/0ea55f3a45744d8785642ef367bff0f9
HTTP/1.1
Host: vxms-xbrick919.xiolab.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"new-name": "new-lgdrm3293"}
```

Response

Note: The successful completion of this command returns no response.

Removing an Initiator Group

DELETE /api/json/v3/types/initiator-groups/<parameter (ini-grp-guid or ini-grp-index or ?name=ini-grp-name)>

This command (DELETE /api/json/v3/types/initiator-groups/<parameter [ini-

Initiator Groups

grp-guid or ini-grp-index or ?name=ini-grp-name]>) enables you to remove an Initiator Group and its associated Initiators.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ini-grp-guid	A unique identifier for the Initiator Group.	Select one of the following: - ini-grp-guid - ini-grp-index - ini-grp-name
ini-grp-index	The index of the Initiator Group.	
ini-grp-name	The name of the Initiator Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Initiator Group.	- No – for single cluster configurations or if ini-grp-guid is specified - Yes – for multiple cluster configurations and if the ini-grp-guid is not specified

Note: A cluster can also be defined as cluster-id in the body, however the cluster definition should only be entered in one location, either the URL or the body.

Example Request

```
DELETE /api/json/v3/types/initiator-groups/0ea55f3a45744d8785642ef367bff0f9
HTTP/1.1
Host: vxms-xbrick919:42503
Authorization: Basic b3BlcmF0aw9u0m9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

iSCSI Portals and Routes

Viewing the List of iSCSI Portals

GET /api/json/v3/types/iscsi-portals

This command (GET /api/json/v3/types/iscsi-portals) displays the list of all iSCSI portals and their parameters.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example Request

```
GET /api/json/v3/types HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "iscsi-portals": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/iscsi-
portals/262381a43335428bbf7bacf2f87ad295",
      "name": "10.205.224.8/16",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/iscsi-
portals/74519fd820854fd7948dacf4c6c94214",
      "name": "10.10.10.10/24",
      "sys-name": "xbrickdrm1652"
    },
    ...
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/iscsi-
portals/ba311b0d4a6046bcbbb0cec5f9d9e07b",
      "name": "10.206.224.3/16",
      "sys-name": "xbrick224-rename"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/iscsi-
portals/",
      "rel": "self"
    }
  ]
}
```

iSCSI Portals and Routes

Viewing the List of iSCSI Routes

GET /api/json/v3/types/iscsi-routes

This command (GET /api/json/v3/types/iscsi-routes) displays the list of iSCSI routes and their parameters.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example Request

GET /api/json/v3/types/iscsi-routes HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "iscsi-routes": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/iscsi-
routes/a8737c847b6b478da0164bc845a537c6",
      "name": "test1",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/iscsi-
routes/",
      "rel": "self"
    }
  ]
}
```


Viewing the Details of a iSCSI Portal

GET /api/json/v3/types/iscsi-portals/<parameter (iscsi-portal-guid or iscsi-portal-index or ?name=iscsi-portal-name)>

This command (GET /api/json/v3/types/iscsi-portals/<parameter [iscsi-portal-guid or iscsi-portal-index or ?name=iscsi-portal-name]>) displays a specific iSCSI portal and its parameters.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
iscsi-portal-guid	A unique identifier for the iSCSI portal.	Select one of the following:
iscsi-portal-index	The index of the iSCSI portal.	
iscsi-portal-name	The name of the iSCSI portal.	
- cluster-index OR - cluster-name	The Cluster index or name of the iSCSI portal.	- No – for single cluster configurations or if iscsi-portal-guid is specified - Yes – for multiple cluster configurations and if the iscsi-portal-guid is not specified

Output Parameter	Description
certainty	Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
index	iSCSI portal's index number as defined by the XMS upon its creation (a unique positive number)
ip-addr	iSCSI portal's IP address (cannot be used for another portal). Format is IP/SN.
ip-port	Display of global <code>iscsi_tcp_port</code> parameter

iSCSI Portals and Routes

Output Parameter	Description
name	iSCSI portal's name as defined by the XMS when creating the index
obj-severity	iSCSI portal's severity, based on severity level of current Alerts (Alerts still uncleared) for this iSCSI portal Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
port-address	The following input format variations are accepted for iSCSI portal Initiators ('X' is a hexadecimal digit – upper case or lower case are allowed): • "XX:XX:XX:XX:XX:XX:XX" • "XXXXXXXXXXXXXXXXXX" • "0XXXXXXXXXXXXXXXXXX" When the Initiator object port_address parameter is queried, the value is always returned in a single output format. IQN and EUI formats are allowed for iSCSI Initiators.
sys-id	For the cluster to which this iSCSI portal belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tar-id	For the Target object associated to this iSCSI portal, a tuple array containing the following parameters (in the following order): the Target's object GUID identifier, the Target name, and the Target index.
tar-index	The index of the target object.
tar-name	The name of the target object.

Output Parameter	Description
tar-type	The type of target object related to this iSCSI Portal. Values: - unknown - fc - iscsi - eth_replication
vlan	The portal information. If not in use, VLAN is 0.
xms-id	For the XMS to which this iSCSI portal belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/iscsi-portals/a91e0f0364204b0498c7ecf4f0ba969d HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

iSCSI Portals and Routes

Response

```
{
  "content": {
    "xms-id": [
      "8a28e66f09e74676ae2fe0a22cb1a75a",
      "xms",
      1
    ],
    "obj-severity": "information",
    "vlan": 0,
    "tar-id": [
      "9efb1bc0267f43ecbe8ac27ccdcbeaea",
      "X1-SC1-target1",
      1
    ],
    "sys-index": 1,
    "ip-port": 3260,
    "sys-name": "xbrickdrm1648",
    "tar-index": 1,
    "ip-addr": "10.10.10.14/24",
    "guid": "a91e0f0364204b0498c7ecf4f0ba969d",
    "sys-id": [
      "c2a5a327f3cb454aa8dae92a124bc1dc",
      "xbrickdrm1648",
      1
    ],
    "index": 1,
    "port-address": "iqn.2008-05.com.xtremio:xio00170303609-514f0c5070cf6401",
    "name": "10.10.10.14/24",
    "certainty": "ok",
    "tar-type": "eth_replication",
    "tar-name": "X1-SC1-target1"
  },
  "links": [
    {
      "guid": "a91e0f0364204b0498c7ecf4f0ba969d",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/iscsi-portals/a91e0f0364204b0498c7ecf4f0ba969d",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of a iSCSI Route

GET /api/json/v3/types/iscsi-routes/<parameter (iscsi-route-guid or iscsi-portal-index or ?name=iscsi-portal-name)>

This command (GET /api/json/v3/types/iscsi-routes/<parameter [iscsi-route-guid or iscsi-route-index or ?name=iscsi-route-name]>) displays a specific iSCSI route and its parameters.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
iscsi-route-guid	A unique identifier for the iSCSI Route.	Select one of the following: - iscsi-route-guid - iscsi-route-index - iscsi-route-name
iscsi-route-index	The index of the iSCSI Route.	
iscsi-route-name	The name of the iSCSI Route.	
- cluster-index OR - cluster-name	The Cluster index or name of the iSCSI Route.	- No – for single cluster configurations or if iscsi-route-guid is specified - Yes – for multiple cluster configurations and if the iscsi-route-guid is not specified

Output Parameter	Description
certainty	This indicates the certainty state. The certainty state indicates confidence that the XMS is synchronized with the system. The value is changed from OK if XMS sends a request to the system but is unable to determine the success of the request.
dest	iSCSI route's destination
gateway	The gateway for this route
index	iSCSI route's index number as defined by the XMS upon its creation (a unique positive number)

iSCSI Portals and Routes

Output Parameter	Description
name	iSCSI route's name
obj-severity	iSCSI route's severity, based on severity level of current Alerts (Alerts still uncleared) for this iSCSI route Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
sys-id	For the cluster to which this iSCSI route belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
xms-id	For the XMS to which this iSCSI route belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/iscsi-routes/fdaac562f729406dbdde9a41373b3161 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "index": 2,
    "xms-id": [
      "8a28e66f09e74676ae2fe0a22cb1a75a",
      "xms",
      1
    ],
    "name": "",
    "dest": "255.255.0.0/16",
    "obj-severity": "information",
    "certainty": "ok",
    "gateway": "192.168.10.254",
    "sys-index": 1,
    "sys-name": "xbrickdrm1648",
    "guid": "fdaac562f729406dbdde9a41373b3161",
    "sys-id": [
      "c2a5a327f3cb454aa8dae92a124bc1dc",
      "xbrickdrm1648",
      1
    ]
  },
  "links": [
    {
      "guid": "fdaac562f729406dbdde9a41373b3161",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/iscsi-
routes/fdaac562f729406dbdde9a41373b3161",
      "rel": "self"
    }
  ]
}
```

iSCSI Portals and Routes

Adding an iSCSI Portal

POST /api/json/v3/types/iscsi-portals

This command (POST /api/json/v3/types/iscsi-portals) enables you to map a portal (which is a combination of an IP address and an IP port) to a Target.

This allows the target port to accept iSCSI traffic via the portal.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
ip-addr	IP address (cannot be used for another portal)	Yes
tar-id	For the Target object associated to this iSCSI portal, a tuple array containing the following parameters (in the following order): the Target's object GUID identifier, the Target name, and the Target index.	Yes
vlan	VLAN index number	No

Example request

```
POST /api/json/v3/types/iscsi-portals HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"cluster-id":"xbrickdrm1648","ip-addr":"152.62.109.59/24", "tar-id":2}
```


Response

```
{
  "links": [
    {
      "guid": "6c32d1f2bba1436eb7051eb8bc63f1eb",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/iscsi-
portals/6c32d1f2bba1436eb7051eb8bc63f1eb",
      "rel": "self"
    }
  ]
}
```

iSCSI Portals and Routes

Adding an iSCSI Route

POST /api/json/v3/types/iscsi-routes

This command (POST /api/json/v3/types/iscsi-routes) enables you to create an iSCSI route.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
destination-network-and-mask	Destination network and mask	Yes
gateway	Gateway's IP address	Yes
iscsi-route-name	iSCSI's route name	No

Example request

```
POST /api/json/v3/types/iscsi-routes HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"cluster-id":"xbrickdrm1648","destination-network-and-mask":"255.255.0.0/17","gateway":"192.168.10.254"}
```

Response

```
{
  "links": [
    {
      "guid": "287c1526665c46eb9a5ef4f1e5fe3859",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/iscsi-routes/287c1526665c46eb9a5ef4f1e5fe3859",
      "rel": "self"
    }
  ]
}
```

Removing an iSCSI Portal

DELETE /api/json/v3/types/iscsi-portals/<parameter (iscsi-portal-guid or iscsi-portal-index or ?name=iscsi-portal-name)>

This command (DELETE /api/json/v3/types/iscsi-portals/<parameter [iscsi-portal-guid or iscsi-portal-index or ?name=iscsi-portal-name]>) enables you to remove an iSCSI portal mapping from a Target.

After removal, the Target stops accepting iSCSI traffic via the portal.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
iscsi-portal-guid	A unique identifier for the iSCSI portal.	Select one of the following: - iscsi-portal-guid - iscsi-portal-index - iscsi-portal-name
iscsi-portal-index	The index of the iSCSI portal.	
iscsi-portal-name	The name of the iSCSI portal.	
- cluster-index OR - cluster-name	The Cluster index or name of the iSCSI portal.	- No – for single cluster configurations or if iscsi-portal-guid is specified - Yes – for multiple cluster configurations and if the iscsi-portal-guid is not specified

iSCSI Portals and Routes

Example Request

```
DELETE /api/json/v3/types/iscsi-portals/6c32d1f2bba1436eb7051eb8bc63f1eb
HTTP/1.1
Host: vxms-xbrick238:42503
Authorization: Basic b3BlcmF0aw9u0m9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Removing an iSCSI Route

DELETE /api/json/v3/types/iscsi-routes/<parameter (iscsi-route-guid or iscsi-portal-index or ?name=iscsi-portal-name)>

This command (DELETE /api/json/v3/types/iscsi-routes/<parameter [iscsi-route-guid or iscsi-portal-index or ?name=iscsi-portal-name]>) enables you to remove an iSCSI route.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
iscsi-route-guid	A unique identifier for the iSCSI Route.	Select one of the following: - iscsi-route-guid - iscsi-route-index - iscsi-route-name
iscsi-route-index	The index of the iSCSI Route.	
iscsi-route-name	The name of the iSCSI Route.	

iSCSI Portals and Routes

Input Parameter	Description	Mandatory
- cluster-index OR - cluster-name	The Cluster index or name of the iSCSI Route.	- No – for single cluster configurations or if iscsi-route-guid is specified - Yes – for multiple cluster configurations and if the iscsi-route-guid is not specified

Example Request

```
DELETE /api/json/v3/types/iscsi-routes/fdaac562f729406dbdde9a41373b3161
HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic b3BlcmF0aw9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

LDAP Configurations

LDAP Configurations

Viewing the List of LDAP Configurations

GET /api/json/v3/types/ldap-configs

This command (GET /api/json/v3/types/ldap-configs) displays the list of LDAP Configurations.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

GET /api/json/v3/types/ldap-configs HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
{
  "ldap-configs": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/ldap-
configs/a3a512d271a8499a8c18e1855ed68fcf",
      "name": ""
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/ldap-
configs/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of an LDAP Configuration

GET /api/json/v3/types/ldap-configs/<parameter (ldap-config-guid or ldap-config-index or ?name=ldap-config-name)>

This command (GET /api/json/v3/types/ldap-configs/<parameter [ldap-config-guid or ldap-config-index or ?name=ldap-config-name]>) displays the details of the selected LDAP Configuration.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ldap-config-guid	A unique identifier for the LDAP Configuration.	Select one of the following: • ldap-config-guid • ldap-config-index • ldap-config-name
ldap-config-index	The index of the LDAP Configuration.	
ldap-config-name	The name of the LDAP Configuration.	

Output Parameter	Description
bind-dn	Bind distinguished number: CN=<value>, OU=<value>, DC=<value>, DC=<value>
bind-pw	Bind password (must have a value)
ca-cert-data	The certification authority data
ca-cert-file	The certification authority file
cache-expire-hours	The number of hours for retaining cached data before expiry. The default value is 24 hours.
index	LDAP Configuration's index number as defined by the XMS upon its creation (a unique positive number)
name	LDAP Configuration's name

LDAP Configurations

Output Parameter	Description
obj-severity	LDAP Configuration's severity, based on severity level of current Alerts (Alerts still uncleared) for this LDAP Configuration. Values: - clear - No Alerts exist for this entity. - information - The highest severity for this entity and all contained objects is information. - minor - The highest severity for this entity and all contained objects is minor. - major - The highest severity for this entity and all contained objects is major. - critical - The highest severity for this entity and all contained objects is critical.
roles	Roles to DN Mapping List
search-base	Search base: OU=<value>, DC=<value>, DC=<value>
search-filter	The search filter type
server-url	The LDAP configuration server's URL
server-urls	URLs for LDAP authentication/active directory configuration examples
sys-id	For the cluster to which this LDAP Configuration belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
timeout	The command's timeout period in seconds. The default value is 1500 seconds.
user-to-dn-rule	User to distinguished name rule (active directory user to DN rules)
xms-id	For the XMS to which this LDAP Configuration belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/ldap-configs/a3a512d271a8499a8c18e1855ed68fcf HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "server-urls": null,
    "user-to-dn-rule": null,
    "timeout": 1500,
    "obj-severity": "information",
    "ca-cert-data": null,
    "sys-index": "",
    "search-filter": "sam={username}",
    "sys-name": "",
    "ca-cert-file": null,
    "xms-id": [
      "36b0474eca4240cca658740c198d0faf",
      "xms",
      1
    ],
    "bind-pw": "xxxxxxx",
    "guid": "a3a512d271a8499a8c18e1855ed68fcf",
    "sys-id": [],
    "index": 1,
    "server-url": [
      "ldap://foo.bar.com",
      "ldap://bar.baz.com"
    ],
    "name": "",
    "roles": [
      "admin:dc=a,dc=b"
    ],
    "bind-dn": null,
    "search-base": null,
    "cache-expire-hours": 24
  },
  "links": [
    {
      "guid": "a3a512d271a8499a8c18e1855ed68fcf",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/ldap-configs/a3a512d271a8499a8c18e1855ed68fcf",
      "rel": "self"
    }
  ]
}
```

LDAP Configurations

Adding an LDAP Configuration

POST /api/json/v3/types/ldap-configs

This command (PUT /api/json/v3/types/ldap-configs/<parameter [ldap-config-id or ?name=ldap-config-name]>) enables you to add an LDAP configuration.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
roles	The roles to DN Mapping List. Values: - admin: CN=SuperUsers, DC=<example>, DC=com - read_only: CN=Users, DC=<example>, DC=com	Yes
search-filter	The search filter type	Yes
server-urls	URLs for LDAP authentication/active directory configuration examples	Yes
bind-dn	Bind distinguished number: CN=<value>, OU=<value>, DC=<value>, DC=<value>	No
bindpw	Bind password (must have a value)	No
ca-cert-data	The certification authority data	No
cache-expire-hours	The number of hours for retaining cached data before expiry. The default value is 24 hours.	No
search-base	Search base: OU=<value>, DC=<value>, DC=<value>	No
timeout	The command's timeout period in seconds. The default value is 1500 seconds.	No
user-to-dn-rule	User to distinguished name rule (active directory user to DN rules)	No

Example Request

POST /api/json/v3/types/ldap-configs/1 HTTP/1.1

Host: vxms-xbrickdrm1624.xiodrm.lab.emc.com

Authorization: Basic *****

Cache-Control: no-cache

```
{"cache-expire-hours":"20","server_uls":["ldap://foo.bar.com"],"search-filter":"sam={username}","roles":["admin:dc=a,dc=b"]}
```

Response

```
{
  "links": [
    {
      "guid": "a7b6eb28a72740f4afe0efc4f647f97b",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/ldap-configs/a7b6eb28a72740f4afe0efc4f647f97b",
      "rel": "self"
    }
  ]
}-
```

LDAP Configurations

Modifying an LDAP Configuration

PUT /api/json/v3/types/ldap-configs/<parameter (ldap-config-guid or ldap-config-index or ?name=ldap-config-name)>

This command (PUT /api/json/v3/types/ldap-configs/<parameter [ldap-config-guid or ldap-config-index or ?name=ldap-config-name]>) enables you to modify the selected LDAP configuration.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ldap-config-guid	A unique identifier for the LDAP Configuration.	Select one of the following: • ldap-config-guid • ldap-config-index • ldap-config-name
ldap-config-index	The index of the LDAP Configuration.	
ldap-config-name	The name of the LDAP Configuration.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
binddn	Bind DN	Select one of the following: • binddn • server-urls • bindpw • user-to-dn-rule • cache-expire-hours • roles • ca-cert-data • search-base • search-filter • timeout
bindpw	Bind password	
ca-cert-data	X509 server certificate	
cache-expire-hours	Credentials expiration	
roles	Role to DN mapping list	
search-base	Search base string	
search-filter	Search filter	
server-urls	Server URLs	
timeout	Connection timeout	
user-to-dn-rule	User to DN substitution	

Example Request

```
PUT /api/json/v3/types/ldap-configs/a7b6eb28a72740f4afe0efc4f647f97b HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"cache-expire-hours":"20"}
```

Response

Note: The successful completion of this command returns no response.

LDAP Configurations

Deleting an LDAP Configuration

DELETE /api/json/v3/types/ldap-configs/<parameter (ldap-config-guid or ldap-config-index or ?name=ldap-config-name)>

This command (DELETE /api/json/v3/types/ldap-configs/<parameter [ldap-config-guid]>) enables you to deleted the selected LDAP configuration.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ldap-config-guid	A unique identifiier for the LDAP Configuration.	Select one of the following: • ldap-config-guid • ldap-config-index • ldap-config-name
ldap-config-index	The index of the LDAP Configuration.	
ldap-config-name	The name of the LDAP Configuration.	

Example Request

```
DELETE /api/json/v3/types/ldap-configs/a7b6eb28a72740f4afe0efc4f647f97b
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Local Disks

Viewing the List of Local Disks

GET /api/json/v3/types/local-disks

This command (GET /api/json/v3/types/local-disks) displays the list of Local Disks.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

```
GET /api/json/v3/types/local-disks HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Local Disks

Response

```
{
  "links": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/local-disks/",
      "rel": "self"
    }
  ],
  "local-disks": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/local-disks/7bb811a2ee0d4558b1388a1dcd597a8b",
      "name": "X1-SC1-LocalDisk1",
      "sys-name": "xbrickdrm1648"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/local-disks/d02c4137bcc04c5f8b2faf6d4f7c492e",
      "name": "X1-SC1-LocalDisk3",
      "sys-name": "xbrickdrm1648"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/local-disks/ad2cc2b999ec4451a86234ab2460771ce",
      "name": "X1-SC1-LocalDisk4",
      "sys-name": "xbrickdrm1648"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/local-disks/acb7da872aeb41d5be67a74d7411606c",
      "name": "X1-SC2-LocalDisk1",
      "sys-name": "xbrickdrm1648"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/local-disks/97d2b88678ed407099b674657a28e168",
      "name": "X1-SC2-LocalDisk3",
      "sys-name": "xbrickdrm1648"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/local-disks/8e78af852d3443f396a87e1079f66a90",
      "name": "X1-SC2-LocalDisk4",
      "sys-name": "xbrickdrm1648"
    }
  ]
}
```


Viewing the Details of a Local Disk

GET /api/json/v3/types/local-disks/<parameter (local-disk-guid or local-disk-index or ?name=local-disk-name)>

This command (GET /api/json/v3/types/local-disks/<parameter [local-disk-guid or local-disk-index or ?name=local-disk-name]>) displays the details of the selected Local Disk.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
local-disk-guid	A unique identifier for the Local Disk.	Select one of the following: - local-disk-guid - local-disk-index - local-disk-name
local-disk-index	The index of the Local Disk.	
local-disk-name	The name of the Local Disk.	
- cluster-index OR - cluster-name	The Cluster index or name of the Local Disk..	- No – for single cluster configurations or if local-disk-guid is specified - Yes – for multiple cluster configurations and if the local-disk-guid is not specified

Output Parameter	Description
brick-id	For the X-Brick to which this Local Disk belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
disk-failure	The reason for an FRU failure or disconnection. The state of the FRU is reflected by the fru lifecycle state.

Local Disks

Output Parameter	Description
enabled-state	Indicates whether Local Disk is currently enabled or disabled, either by the user or the cluster.
encryption-status	Local Disk's encryption (Data at Rest) status
fru-lifecycle-state	Local Disk's FRU state, using generic FRU transition states Values: • healthy - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • failed - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • disconnected - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • uninitialized - An FRU that has not been initialized passes through this state before initialization. • initializing - Indicates a transient state in which the system performs initialization of a component.
fru-replace-failure-reason	Reason why the FRU replacement has failed. null means that the last FRU replacement was either not performed for this object or the replacement was successful.
fw-version	Current firmware version of the Local Disk
fw-version-error	Reason for FRU diagnostic failure when a firmware problem exists
hw-revision	Hardware level of the power supply unit Note: The value is not always available. GUI and CLI do not display the value when unavailable.
identify-led	Indicates whether the identification LED is illuminated for this Local Disk. The parameter value is reflected in the GUI LED icon.
index	Local Disk index number as defined by the XMS upon its creation (a unique positive number)
local-disk-expected-type	The expected type of disk in this Slot. Similar to the Local Disk type, with an extra possible value of empty, meaning the Slot is expected to be empty.
local-disk-id	A tuple array containing the following parameters (in the following order): the Local-Disk object GUID identifier, the Local-Disk name, and the Local-Disk index.
local-disk-purpose	The purpose of the Local Disk
local-disk-type	The type of Local Disk, ssd or spindle-hdd

Local Disks

Output Parameter	Description
local-disk-uid	A world-wide unique index number read from the disk firmware (same as the serial number)
location-index	The physical location of the component.
model-name	Vendor-assigned SSD model name
name	Local Disk's name
node-id	For the node to which this Local Disk-belongs, a tuple array containing the following parameters (in the following order): the node's object GUID identifier, the node name, and the node index.
node-index	The Index of the node.
node-name	The node name.
num-bad-sectors	Number of bad sectors detected in the Local Disks
obj-severity	Local Disk's severity, based on severity level of current Alerts (Alerts still uncleared) for this Local Disk Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
part-number	An Dell EMC-assigned string identifying the part
slot-num	The index number of the Local Disk object in this Slot. Should be empty for Slot state of empty and error. Note: To determine the Slot state, view the Slot object whose slot-num is the same as the Local-Disk slot-num. For more information, see Viewing the Details of a Slot on page 474.
smart-diagnostics	Array of SMART diagnostics. The response only includes an array for HDDs.
smart-health-status	The reported SMART return status of the latest query. Values: • <code>Healthy</code> – The return status reports no error. • <code>Failed</code> – The returned status reports an error.
status-led	LED state, indicating Local Disk object faults
sys-id	For the cluster to which this Local Disk-belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.

Local Disks

Output Parameter	Description
sys-index	The index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags
xms-id	For the XMS to which this Local Disk belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

GET /api/json/v3/types/local-disks/c90f012fbfbf4e87a454715c9c45c796 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "content": {
    "fru-lifecycle-state": "healthy",
    "obj-severity": "information",
    "smart-health-status": "healthy",
    "sys-index": 1,
    "encryption-status": "enc_not_supported",
    "location-index": 1,
    "fru-replace-failure-reason": "",
    "guid": "c90f012fbfbf4e87a454715c9c45c796",
    "index": 1,
    "fw-version-error": "no_error",
    "slot-num": 4,
    "local-disk-purpose": "journal_and_boot_disk",
    "identify-led": "off",
    "brick-name": "X1",
    "hw-revision": "na",
    "local-disk-uid": "wwn_[500a07510ee30b00]_serial_[15090EE30B00      ]",
    "num-bad-sectors": 0,
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "node-name": "X1-SC1",
    "fw-version": "0146",
    "sys-name": "xbrickdrm919",
    "local-disk-expected-type": "ssd",
    "part-number": "**** M500DC400-MTFDBA",
    "node-index": 1,
    "brick-index": 1,
    "sys-id": [
```

```

        "7e0bbd4b7d69477ab32e2953636a70de",
        "xbrickdrm919",
        1
    ],
    "name": "X1-SC1-LocalDisk1",
    "brick-id": [
        "bb1a71566d7e4756a4e902bc7a029e57",
        "X1",
        1
    ],
    "disk-failure": "ok",
    "status-led": "na",
    "enabled-state": "enabled",
    "serial-number": "15090EE30B00",
    "model-name": "M500DC400-MTFDBA",
    "local-disk-id": [
        "c90f012fbfbf4e87a454715c9c45c796",
        "X1-SC1-LocalDisk1",
        1
    ],
    "node-id": [
        "c55567c5dfd1459bad83c9de4d5d6f7b",
        "X1-SC1",
        1
    ],
    "local-disk-type": "ssd"
},
"links": [
    {
        "guid": "c90f012fbfbf4e87a454715c9c45c796",
        "href": "https://vxms-xbrickdrm919/api/json/v3/types/local-
disks/c90f012fbfbf4e87a454715c9c45c796",
        "rel": "self"
    }
]
}

```

Local Protections

Viewing the List of Local Protection Sessions

GET /api/json/v3/types/local-protections

This command (GET /api/json/v3/types/local-protections) displays the list of Local Disks.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

```
GET /api/json/v3/types/local-protections HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "local-protections": [
    {
      "href": "https://vxms-xbrickdr1652/api/json/v3/types/local-
protections/f76dabb773d8465c99efbb702a1fefff",
      "name": "DBCg1-Local",
      "sys-name": "xbrickdr1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdr1652/api/json/v3/types/local-
protections/",
      "rel": "self"
    }
  ]
}
```

}

Viewing the Details of a Local Protection Session

GET /api/json/v3/types/local-protections/<parameter (local-protection-guid or local-protection-index or ?name=local-protection-name)>

This command (GET /api/json/v3/types/local-protections/<parameter [local-protection-guid or local-protection-index or ?name=local-protection-name]>) displays the details of the selected Local Protection Session.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
local-protection-guid	A unique identifier for the Local Protection Session.	Select one of the following: - local-protection-guid - local-protection-index - local-protection-name
local-protection-index	The index of the Local Protection Session.	
local-protection-name	The name of the Local Protection Session.	
- cluster-index OR - cluster-name	The Cluster index or name of the Local Protection Session..	- No – for single cluster configurations or if local-protection-guid is specified - Yes – for multiple cluster configurations and if the local-protection-guid is not specified

Local Protections

Output Parameter	Description
actual-protection-window-copies	The actual total number of PIT retained on the replication session.
actual-protection-window-duration-in-days	The actual protection window in days for which the Snapshot Sets exist
create-secured-snap	Indicates if all snapshots created by the local protection session are created as secured.
defined-protection-window-duration-in-days	The defined protection window in days for which the Snapshot Sets exist
defined-protection-window-num-copies	The total number Snapshot Set copies retained. The value is 1 if there is no retention policy assigned or if the target retention policy enabled state is disabled.
enabled-state	Indicates whether local protection is currently enabled or disabled. Values: - enabled - user_disabled
lag-sec	The number of seconds since the creation of the last Snapshot Set.
last-activation-status	The state of the last Local-Protection-Session activation.
last-activation-time	The last time that the Local-Protection-Session has attempted to create Snapshots.
local-protection-type	Indicates the scheduling for Snapshot creation. Values: - interval - explicit
name	The name of Local Protection Session.
next-scheduled-cycle	The time when the next cycle is estimated to start. SYM returns the higher of either the minimal cycle time or an estimate on when the finish the current cycle will finish.

Local Protections

Output Parameter	Description
obj-severity	The Local-Protection-Session's severity, based on severity level of current Alerts (Alerts still uncleared) for this remote protection session Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
rpo-sec	The desired RPO (maximal lag) in seconds. The minimum RPO is 30 seconds. This is stored in the monitoring database as <code>category=latency</code>. Note: In a future release, an RPO of 0 will be supported. The RPO of 0 will indicate that as soon as one cycle completes a new cycle is started.
rpo-status	Indicates whether the RPO is met. Values: • <code>according_to_plan</code> – the RPO is being met. • <code>rpo_exceeded</code> – the RPO is not being met.
schedule	Indicates the Local-Protection-Session schedule based on the local-protection-type. Values: • for <code>local_protection_type</code> of <code>interval</code>, a triplet in the form of "hours : minutes : seconds", where a schedule using hours and minutes must have a seconds value of 0 and a schedule in seconds must have hours and minutes of 0. For example, "1:30:0" takes a Snapshot every 1.5 hours and "0:0:15" takes a Snapshot every 15 seconds. • For <code>local_protection_type</code> of <code>explicit</code>, a triplet in the form of "day-of-week : hour : minute", where day-of-week values 0 is every day, 1 is Sunday, 2 is Monday, 3 is Tuesday, 4 is Wednesday, 5 is Thursday, 6 is Friday, and 7 is Saturday (for example, 1:12:30 takes a Snapshot on Sunday at 12:30, and 0:12:30 takes a Snapshot every day at 12:30).

Local Protections

Output Parameter	Description
snapped-object-id	A tuple array containing the following parameters (in the following order): the snapped object GUID identifier, the snapped name, and the snapped index. The tuple array may be empty (omitted) if only one cluster is defined..
snapped-object-index	The Object index of the entity on which Snapshots are created.
snapped-object-name	The Object name of the entity on which Snapshots are created.
snapped-object-type	The entity on which Snapshots are created by this local protection. Values: • Volume • ConsistencyGroup
snapshot-type	Determines whether the Snapshots created by local protection are writable or readonly. Values: • regular • readonly
suffix	User-defined suffix to be appended to the names of Snapshots created by local protection. Can be empty.
sys-id	For the cluster to which this Local-Protection-Session belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The index of the Cluster.
sys-name	The name of the Cluster.
tag-list	The list of tag associated with this object.

Example Request

```
GET /api/json/v3/types/local-protections/ e863b89a93ab43dc9ba704faf53eaa75
HTTP/1.1
Host: vxms-xbrickdrm823.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Local Protections

```

{
  "content": {
    "local-protection-id": [
      "e863b89a93ab43dc9ba704faf53eaa75",
      "LPS001",
      2
    ],
    "retention-policy-id": [
      "7c2d52656e656e2048616c6c616b2d7c",
      "",
      0
    ],
    "suffix": "",
    "obj-severity": "information",
    "defined-protection-window-duration-in-days": 0,
    "next-scheduled-cycle": "1536064320",
    "defined-protection-window-num-copies": 1,
    "last-activation-status": "successful",
    "guid": "e863b89a93ab43dc9ba704faf53eaa75",
    "snapshot-type": "readonly",
    "snapped-object-id": [
      "6f6612e56e9741dd8dac5d113b710504",
      "test_cg",
      1
    ],
    "index": 2,
    "snapped-object-index": 1,
    "snapshot-set-window-size-status": "ok",
    "lag-sec": 45,
    "snapped-object-type": "ConsistencyGroup",
    "local-protection-type": "interval",
    "schedule": "0:2:0",
    "in-progress": null,
    "actual-protection-window-duration-in-days": 0.0,
    "tag-list": [],
    "sys-name": "xbrick823",
    "last-activation-time": "1536064211",
    "snapshot-set-num-copies-status": "ok",
    "snapped-object-name": "test_cg",
    "sys-id": [
      "05b9c54f89bf4f39aa84a10a947344d1",
      "xbrick823",
      1
    ],
    "name": "LPS001",
    "sys-index": 1,
    "actual-protection-window-copies": 1,
    "certainty": "ok",
    "enabled-state": "enabled",
    "rpo-sec": 120,
    "rpo-status": "according_to_plan"
  },
  "links": [
    {
      "guid": "e863b89a93ab43dc9ba704faf53eaa75",
      "href": "https://10.82.250.110/api/json/v3/types/local-
protections/e863b89a93ab43dc9ba704faf53eaa75",

```

```

    "rel": "self"
  }
]
}

```

Adding a Local Protection Session

POST /api/json/v3/types/local-protections

This command (PUT /api/json/v3/types/local-protections) enables you to create a Local Protection Session.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
local-protection-type	Indicates the scheduling for Snapshot creation. Values: - interval - explicit	Yes
protection-session-name	The name of the Local Protection Session.	Yes
schedule	Indicates the Local Protection schedule based on the local-protection-type. Values: - for local_protection_type of interval, a triplet in the form of "hours : minutes : seconds", where a schedule using hours and minutes must have a seconds value of 0 and a schedule in seconds must have hours and minutes of 0. For example, "1:30:0" takes a Snapshot every 1.5 hours and "0:0:15" takes a Snapshot every 15 seconds. - For local_protection_type of explicit, a triplet in the form of "day-of-week : hour : minute", where day-of-week values 0 is every day, 1 is Sunday, 2 is Monday, 3 is Tuesday, 4 is Wednesday, 5 is Thursday, and 6 is Saturday (for example, 1:12:30 takes a Snapshot on Sunday at 12:30, and 0:12:30 takes a Snapshot every day at 12:30.	Yes
snapped-object-id	The snapped object index or name.	Yes

Local Protections

Input Parameter	Description	Mandatory
snapped-object-type	The Type of the snapped object to be protected locally (Volume or CG only). Values: - Volume - ConsistencyGroup	Yes
cluster-id	The Cluster name or index to assign the Local Protection Session.	No
retention-policy-id	The name or index of a Retention Policy to assign to the Local Protection Session.	No
suffix	User-defined suffix to be appended to the names of Snapshots created by local protection. Can be empty.	No
create-secured-snap	Indicates if all snapshots created by the local protection session are created as secured.	No

Example

POST /api/json/v3/types/local-protections HTTP/1.1

Host: vxms-xbrickdrm1624.xiodrm.lab.emc.com

Authorization: Basic *****

Cache-Control: no-cache

```
{
  "local-protection-type": "interval",
  "protection-session-name": "LocalSession_PRD-CG1",
  "enabled-state": "enabled",
  "retention-policy-id": "5minutes",
  "schedule": "0:0:15",
  "snapped-object-id": "PRD-CG",
  "snapped-object-type": "ConsistencyGroup",
  "cluster-id": "xbrickdrm1648"
}
```

Response

```
{
  "links": [
    {
      "guid": "272657479b0b4b6aba1187e0189c2da5",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/local-protections/272657479b0b4b6aba1187e0189c2da5",
      "rel": "self"
    }
  ]
}
```

Managing a Local Protection Session

PUT /api/json/v3/commands/local-protections/<operation>/<parameter (local-protection-guid or local-protection-index or ?name=local-protection-name)>

This command (PUT /api/json/v3/commands/local-protections/<operation>/<parameter [local-protection-guid or local-protection-index or ?name=local-protection-name]>) enables you to start, suspend, and resume a Local Protection Session.

Input Parameter	Description	Mandatory
local-protection-guid	A unique identifier for the Local Protection Session.	Select one of the following: - local-protection-guid - local-protection-index - local-protection-name
local-protection-index	The index of the Local Protection Session.	
local-protection-name	The name of the Local Protection Session.	
- cluster-index OR - cluster-name	The Cluster index or name of the Local Protection Session..	- No – for single cluster configurations or if local-protection-guid is specified - Yes – for multiple cluster configurations and if the local-protection-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory

Local Protections

Input Parameter	Description	Mandatory
operation	The Local Protection Session management operation to perform. Values: - start – start a Local Protection Session - suspend – suspend a Local Protection Session - resume – resume a Local Protection Session	Yes

Example - Start

```
PUT /api/json/v3/commands/local-
protections/start/d220591c0a134ea39a16e5dba8ad0db0 HTTP/1.1
Host: vxms-xbrickdrm1624.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Example - Suspend

```
PUT /api/json/v3/commands/local-
protections/suspend/d220591c0a134ea39a16e5dba8ad0db0 HTTP/1.1
Host: vxms-xbrickdrm1624.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Example - Resume

```
PUT /api/json/v3/commands/local-  
protections/resume/d220591c0a134ea39a16e5dba8ad0db0 HTTP/1.1  
Host: vxms-xbrickdrm1624.xiodrm.lab.emc.com  
Authorization: Basic *****  
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Local Protections

Modifying a Local Protection Session

PUT /api/json/v3/types/local-protections/<parameter (local-protection-guid or local-protection-index or ?name=local-protection-name)>

This command (PUT /api/json/v3/types/local-protections/<parameter [local-protection-guid or local-protection-index or ?name=local-protection-name]>) enables you to modify a Local Protection Session.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
local-protection-guid	A unique identifier for the Local Protection Session.	Select one of the following: - local-protection-guid - local-protection-index - local-protection-name
local-protection-index	The index of the Local Protection Session.	
local-protection-name	The name of the Local Protection Session.	
- cluster-index OR - cluster-name	The Cluster index or name of the Local Protection Session..	- No – for single cluster configurations or if local-protection-guid is specified - Yes – for multiple cluster configurations and if the local-protection-guid is not specified

Local Protections

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
local-protection-type	Indicates the scheduling for Snapshot creation. Values: - interval - explicit	Select at least one of the following: - local_protection_type - new-protection-session-name - retention-policy-id - schedule - snapped-object-id - snapped-object-type - suffix
new-protection-session-name	The name of the Local Protection Session.	
retention-policy-id	The name or index of a Retention Policy to assign to the Local Protection Session.	
schedule	Indicates the Local Protection schedule based on the local-protection-type. Values: - for local_protection_type of interval, a triplet in the form of "hours : minutes : seconds", where a schedule using hours and minutes must have a seconds value of 0 and a schedule in seconds must have hours and minutes of 0. For example, "1:30:0" takes a Snapshot every 1.5 hours and "0:0:15" takes a Snapshot every 15 seconds. - For local_protection_type of explicit, a triplet in the form of "day-of-week : hour : minute", where day-of-week values 0 is every day, 1 is Sunday, 2 is Monday, 3 is Tuesday, 4 is Wednesday, 5 is Thursday, and 6 is Saturday (for example, 1:12:30 takes a Snapshot on Sunday at 12:30, and 0:12:30 takes a Snapshot every day at 12:30).	
snapped-object-id	The Id of the snapped object to be protected locally.	
snapped-object-type	The Type of the snapped object to be protected locally (Volume or CG only). Values: - Volume - ConsistencyGroup	
suffix	User-defined suffix to be appended to the names of Snapshots created by local protection. Can be empty.	No
sys-id	Cluster's name or index number. May be omitted if only one cluster is defined.	

Local Protections

Input Parameter	Description	Mandatory
create-secured-snap	Indicates whether all snapshots created by the local protection session are created as secured.	No

Example

```
PUT /api/json/v3/types/local-protections/d220591c0a134ea39a16e5dba8ad0db0
HTTP/1.1
Host: vxms-xbrickdrm1624.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"new-protection-session-name":"LocalSession_PRD-
CG1_rename", "suffix":"LocalSession_PRD-CG1"}
```

Response

Note: The successful completion of this command returns no response.

LUN Mapping

Viewing the List of LUN Mappings

GET /api/json/v3/types/lun-maps

This command (GET /api/json/v3/types/lun-maps) displays the list of LUN mappings between Volumes and Initiator Groups.

Example request

```
GET /api/json/v3/types/lun-maps HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

LUN Mapping

Response

```
{
  "lun-maps": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/a687256bd8004e52a16d7483e5e12efa",
      "name": "1_1_1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/afe632328165426c97a2ae52f9bde37e",
      "name": "1_2_1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/ce987bd328024f6d956e68581ffffbb21",
      "name": "2_1_1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/cd02f93f0147455f9c6c51f0766b54f3",
      "name": "2_2_1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/c90972648ae94f9b8c46582c3b37e67e",
      "name": "3_2_1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/6f185b4021a64c84bdb86e520bcff381",
      "name": "3_1_1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/6ba48001e25849dd80841cd67ec12287",
      "name": "4_2_1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/949e4056592947e6bc770badba1a22b2",
      "name": "4_1_1",
      "sys-name": "xbrick224-rename"
    },
    ...
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/1d4e67401cec4d95877b961c308437bd",

```

```
        "name": "76_2_1",
        "sys-name": "xbrickdrm1652"
      },
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-
maps/3b607078c7d140829dc990f70074a813",
        "name": "85_5_1",
        "sys-name": "xbrickdrm1652"
      }
    ],
    "links": [
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/lun-maps/",
        "rel": "self"
      }
    ]
  }
}
```

LUN Mapping

Viewing the Details of a LUN Mapping

GET /api/json/v3/types/lun-maps/<parameter (lun-maps-guid or lun-maps-index or ?name=lun-maps-name)>

This command (GET /api/json/v3/types/lun-maps<parameter [lun-maps-guid or lun-maps-index or ?name=lun-maps-name]>) displays the selected LUN mapping's details.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
lun-maps-guid	A unique identifier for the LUN Mapping.	Select one of the following: • lun-maps-guid • lun-maps-index • lun-maps-name
lun-maps-index	The index of the LUN Mapping.	
lun-maps-name	The name of the LUN Mapping.	
• cluster-index - OR • cluster-name	The Cluster index or name of the LUN Mapping.	• No – for single cluster configurations or if lun-maps-guid is specified • Yes – for multiple cluster configurations and if the lun-maps-guid is not specified

Output Parameter	Description
certainty	Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
ig-id	For the Initiator Group to which this LUN Mapping belongs, a tuple array containing the following parameters (in the following order): the Initiator Group's object GUID identifier, the Initiator Group name, and the Initiator Group index.
ig-index	Initiator Group index number

Output Parameter	Description
ig-name	Initiator Group's name
index	LUN Mapping's index number as defined by the XMS upon its creation (a unique positive number)
lun	Unique LUN identification, exposing the Volume to the host
mapping-id	Internal XMS LUN mapping's index number
mapping-index	LUN mapping's index number
name	LUN map's name
obj-severity	LUN map's severity, based on severity level of current Alerts (Alerts still uncleared) for this LUN map Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
sys-id	For the cluster to which this LUN Mapping belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tg-id	For the Target Group to which this LUN Mapping belongs, a tuple array containing the following parameters (in the following order): the Target Group's object GUID identifier, the Target Group name, and the Target Group index.
tg-index	Target's Group's index number
tg-name	Name of the LUN map Target Group
vol-index	Volume's index number
vol-name	Volume's name
xms-id	For the XMS to which this LUN Mapping belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

LUN Mapping

Example Request

```
GET /api/json/v3/types/lun-maps/fabfc7a803014d08836c79b5ab7bc982 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "mapping-index": 1,
    "obj-severity": "information",
    "sys-index": 1,
    "sys-name": "xbrickdrm919",
    "tg-id": [
      "eee056dcb5fa4f50916c997a14936e6b",
      "Default",
      1
    ],
    "ig-name": "lgdrm1841",
    "guid": "fabfc7a803014d08836c79b5ab7bc982",
    "vol-name": "1",
    "index": 1,
    "tg-name": "Default",
    "ig-index": 1,
    "name": "14_1_1",
    "ig-id": [
      "8e8ed7c6765d438ab97106b86c6e0220",
      "lgdrm1841",
      1
    ],
    "certainty": "ok",
    "sys-id": [
      "7e0bbd4b7d69477ab32e2953636a70de",
      "xbrickdrm919",
      1
    ],
    "tg-index": 1,
    "lun": 4,
    "vol-index": 14,
    "mapping-id": [
      "fabfc7a803014d08836c79b5ab7bc982",
      "14_1_1",
      1
    ]
  },
  "links": [
    {
      "guid": "fabfc7a803014d08836c79b5ab7bc982",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/lun-
maps/fabfc7a803014d08836c79b5ab7bc982",
      "rel": "self"
    }
  ]
}
```

LUN Mapping

Creating a LUN Mapping

POST /api/json/v3/types/lun-maps

This command (POST /api/json/v3/types/lun-maps) enables you to create LUN mapping between Volumes and Initiator Groups.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
ig-id	Initiator Group's name or index number	Yes
vol-id	Volume's name or index number	Yes
tg-id	Target Group's name or index number	No
lun	Unique LUN identification, exposing the Volume to the host	No

Example request

```
POST /api/json/v3/types/lun-maps HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"cluster-id":"xbrickdrm919","vol-id":"VolTW.1401","ig-id":"ig-TW001"}
```

Response

```
{
  "links": [
    {
      "guid": "88c05d2f665147c08c3a0d50a4290b13",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/lun-
maps/88c05d2f665147c08c3a0d50a4290b13",
      "rel": "self"
    }
  ]
}
```

Removing a LUN Mapping

DELETE /api/json/v3/types/lun-maps/<parameter (lun-maps-guid or lun-maps-index or ?name=lun-maps-name)>

This command (DELETE /api/json/v3/types/lun-maps/<parameter [lun-maps-guid or lun-maps-index or ?name=lun-maps-name]>) enables you to remove a Volume’s LUN mapping.

Note: Removing a Volume’s entire LUN mapping via RESTful API can only be achieved by removing one LUN mapping at a time.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
lun-maps-guid	A unique identifier for the LUN Mapping.	Select one of the following: - lun-maps-guid - lun-maps-index - lun-maps-name
lun-maps-index	The index of the LUN Mapping.	
lun-maps-name	The name of the LUN Mapping.	
- cluster-index OR - cluster-name	The Cluster index or name of the LUN Mapping.	- No – for single cluster configurations or if lun-maps-guid is specified - Yes – for multiple cluster configurations and if the lun-maps-guid is not specified

Note: A cluster can also be defined as `cluster-id` in the body, however the cluster definition should only be entered in one location, either the URL or the body.

LUN Mapping

Example Request

```
DELETE /api/json/v3/types/lun-maps/28fb336da9b6483b9960204c4bd426d2 HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

NVRAM

Note: NVRAMs are available in X2 clusters only.

Viewing the List of NVRAMs

GET /api/json/v3/types/nvrams

This command (GET /api/json/v3/types/nvrams) displays information about the NVRAM. The NVRAM replaces the BBUs in X2.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
cluster-name	The cluster's name.	No

Example request

GET /api/json/v3/types/nvrams HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "nvrams": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/nvrams/8adc9be9839c4e9ab919f1a16a5380a1",
      "name": "X1-SC1-NVRAM"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/nvrams/fefe051ad4eb425d97f834f17e716481",
      "name": "X1-SC2-NVRAM"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/nvrams/",
      "rel": "self"
    }
  ]
}
```

NVRAM

Viewing the Details of an NVRAM

GET /api/json/v3/types/nvrams/<parameter (nvram-guid or nvram-index or ?name=nvram-name)>

This command (GET /api/json/v3/types/nvrams/<parameter [nvram-guid or nvram-index or ?name= nvram-name]>) displays information about a specific NVRAM. The NVRAM replaces the BBUs in X2.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
nvram-guid	A unique identifier for the NVRAM.	Select one of the following: • nvram-guid • nvram-index • nvram-name
nvram-index	The index of the NVRAM.	
nvram-name	The name of the NVRAM.	

Output Parameter	Description
fru-lifecycle-state	The NVRAM's FRU state using the generic FRU transition states. Values: • healthy - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • failed - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • disconnected - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • uninitialized - An FRU that has not been initialized passes through this state before initialization. • initializing - Indicates a transient state in which the system performs initialization of a component.
supercap-max-temp	The NVRAM SuperCap's maximum temperature. The value is in Celsius.

Output Parameter	Description
obj-severity	NVRAM's severity, based on severity level of current Alerts (Alerts still uncleared) for this NVRAM. Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
sys-index	The physical index of the system to which the object belongs.
nvr-am-number-of-restore	The number of NVRAM restore attempts since the system was formed.
flash-bad-block-level	The status level of the number of NVRAM's bad blocks. Values: • Healthy – Not too many bad blocks. • Marginal – The number of bad blocks is above the threshold, but the NVRAM is not declared failed. • High – The number of bad blocks is above the threshold and the NVRAM is declared failed.
nvr-am-last-restore-duration	The number of seconds to complete the last restore.
flash-wear-level	The status level of the number of NVRAM's backups performed within the cycle budget for backups. Values: • Healthy – The number of backups is below 97% of the cycle budget. • Marginal – At least 97% of the cycle budget were performed, but less than the high threshold. This is only a warning. • High – More than 99.5% of cycle budget were performed. The FLASH is worn out. SC replacement is required.
nvr-am-last-backup-status	Indicates the status of the last NVRAM backup, such as "saved".
index	The NVRAM's index.
guid	A unique identifier for the NVRAM.
nvr-am-last-restore-time	The timestamp (UTC) of the last NVRAM restore attempt. The value of 0 indicates no restore has been attempted.

NVRAM

Output Parameter	Description
fw-version-error	The NVRAM's FW failure reason diagnosed by the FRU. Values: - No Error – The FW version and the target FW are the same. - Upgrading – The FW version is in the process of upgrading. - Invalid FW version – The FW version is invalid and cannot be used. - Mismatch FW version – The FW version does not match the target FW version, is not optimal, but is usable.
nvr-am-number-of-fw-upgrades	The number of NVRAM FW upgrade attempts since the system was formed.
supercap-short-circuit	This indicates whether a short circuit is detected in the NVRAM's SuperCap for more than 30 seconds. Values: - No – No short circuit. - Yes – A short circuit was detected for more than 30 seconds. This is a SuperCap failure.
nvr-am-number-of-backup	The number of NVRAM backup attempts since the system was formed. This is a persistent property.
nvr-am-id	The Id of the NVRAM object.
xms-id	For the XMS to which this NVRAM belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.
nvr-am-card-temp	The NVRAM's card temperature. The value is in Celsius.
acc-correctable-errors	The number of accumulated NVRAM ECC correctable errors since the node was reformatted.
node-name	The name of the node to which this module belongs
nvr-am-last-restore-status	Indicates the status of the last NVRAM restore, such as "Done".
correctable-errors	The number of hardware NVRAM ECC correctable errors.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
node-index	The index of the node to which this module belongs
supercap-temp	The current NVRAM's SuperCap temperature. The value is in Celsius.

Output Parameter	Description
sys-id	For the cluster to which this NVRAM belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
supercap-temp-level	This indicates the temperature level of the NVRAM's SuperCap. Values: • Healthy – The NVRAM SuperCap's temperature is within the normal range. • High – The NVRAM SuperCap's temperature is high and charging the SuperCap is suspended. • Very High - NVRAM temperature is very high and the SuperCap cannot be used
name	The name of the NVRAM.
nvram-last-backup-duration	The number of seconds to complete the last NVRAM backup.
nvram-number-of-backups-bank2	The number of NVRAM backup attempts to bank 2 since the system was formed.
nvram-number-of-backups-bank1	The number of NVRAM backup attempts to bank 1 since the system was formed.
flash-num-bad-blocks	The number of NVRAM bad blocks.
nvram-fail-reason	Indicates the name of all properties causing the NVRAM to fail.
nvram-last-backup-time	The timestamp (UTC) of the last NVRAM backup attempt.
fw-version	The NVRAM FW version.
node-id	For the node to which this NVRAM-belong, a tuple array containing the following parameters (in the following order): the node's object GUID identifier, the node name, and the node index.
nvram-internal-state	Indicates NVRAM state from the device state. This property is used for debugging purposes.

Example request

```
GET /api/json/v3/types/nvrams/1?cluster-index=1 HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

NVRAM

Response

```
{
  "content": {
    "fru-lifecycle-state": "healthy",
    "supercap-max-temp": 38,
    "obj-severity": "information",
    "sys-index": 1,
    "flash-bad-block-level": "healthy",
    "nvram-last-restore-duration": 12,
    "guid": "8adc9be9839c4e9ab919f1a16a5380a1",
    "nvram-last-backup-status": "saved",
    "index": 1,
    "supercap-temp": 31,
    "nvram-number-of-restores": 32,
    "nvram-last-restore-time": 1517310963,
    "fw-version-error": "no_error",
    "nvram-number-of-fw-upgrades": 27,
    "supercap-short-circuit": "no",
    "nvram-id": [
      "8adc9be9839c4e9ab919f1a16a5380a1",
      "X1-SC1-NVRAM",
      1
    ],
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "nvram-card-temp": 48,
    "node-name": "X1-SC1",
    "nvram-last-restore-status": "DONE",
    "fw-version": "2.7.14.3",
    "sys-name": "xbrickdrm919",
    "node-index": 1,
    "sys-id": [
      "7e0bbd4b7d69477ab32e2953636a70de",
      "xbrickdrm919",
      1
    ],
    "supercap-temp-level": "healthy",
    "name": "X1-SC1-NVRAM",
    "nvram-last-backup-duration": 17,
    "flash-num-bad-blocks": 34,
    "nvram-fail-reason": "",
    "nvram-last-backup-time": 1517310496,
    "nvram-number-of-backups": 48,
    "node-id": [
      "c55567c5dfd1459bad83c9de4d5d6f7b",
      "X1-SC1",
      1
    ],
    "nvram-internal-state": "OPERATIONAL"
  },
  "links": [
    {

```

```
      "guid": "8adc9be9839c4e9ab919f1a16a5380a1",  
      "href": "https://vxms-  
xbrickdrm919/api/json/v3/types/nvrams/8adc9be9839c4e9ab919f1a16a5380a1",  
      "rel": "self"  
    }  
  ]  
}
```

Performance

Viewing the Details of Entity Performance

GET /api/json/v3/types/performance?entity=[entity type]

This command (GET /api/json/v3/types/performance?entity=[entity type]) displays the performance of the defined entity type).

The available entity types are listed below:

- ♦ Cluster
- ♦ ConsistencyGroup
- ♦ DataProtectionGroup
- ♦ Initiator
- ♦ InitiatorGroup
- ♦ IPLink
- ♦ ReplicationSession
- ♦ SnapshotGroup
- ♦ SSD
- ♦ Tag
- ♦ Target
- ♦ TargetGroup
- ♦ Volume
- ♦ XEnv
- ♦ Xms

Note: Ensure that the syntax of the entity is entered as shown in the list above. The first letter of the entity name is always in upper case.

Performance Input Parameters

The following table describes the parameters that can be used within the URL, to filter the performance query:

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's identification name or index number	- No – if the entity-guid is used or for a single cluster configuration - Yes – if the entity-id or entity-name is used for a multiple cluster configuration

Performance

Input Parameter	Description	Mandatory
entity	A type of entity on which performance can be queried Values: • Cluster • ConsistencyGroup • DataProtectionGroup • IPLink • Initiator • InitiatorGroup • ReplicationSession • SnapshotGroup • SSD • Tag • Target • TargetGroup • Volume • XEnv • Xms Note: Ensure that the syntax of the entity is entered as shown in the list above. The first letter of the entity name is always in upper case. Note: For the Tag performance call, the Tag name must also be entered in the request. For example: /api/json/v3/types/performance?entity=Tag&entity-name=/Volume/Tag61 Where: - The Tag name must be listed after the entity-guid, entity-name, or entity-index. - The Tag name must be prefixed with Tag type. In our example the Tag name is Tag61 and the Tag type is Volume. Command example: .../api/json/v3/types/performance?entity=Cluster&granularity=one_day&export-to-file=test.txt	Yes

Performance

Input Parameter	Description	Mandatory
aggregation-type	Aggregation function of the request Values: - avg (default) - max - min Note: If aggregation-type is not included in the command line, the default value for the output is avg. The value applies to all historical numerical values in the query. Command example: .../api/json/v3/types/performance?entity=Cluster&aggregation-type=max	No
entity-guid	The guid of the entity Note: Multiple entities can be listed simultaneously by entity-guid, entity-index, and entity-name. Command example: ...api/json/v3/types/performance?entity=Volume&cluster-id=1&entity-guid=fb1e41c1072640f28fc1a3945206b5a4&entity-index=4&entity-name=DB03	No
entity-index	The index of the entity Note: Multiple entities can be listed simultaneously by both entity-index and entity-name. Command example: ...api/json/v3/types/performance?entity=Volume&cluster-id=1&entity-guid=fb1e41c1072640f28fc1a3945206b5a4&entity-index=4&entity-name=DB03	No
entity-name	The name of the entity Note: Multiple entities can be listed simultaneously by both entity-index and entity-name. Command example: api/json/v3/types/performance?entity=Volume&cluster-id=1&entity-guid=fb1e41c1072640f28fc1a3945206b5a4&entity-index=4&entity-name=DB03	No

Performance

Input Parameter	Description	Mandatory
export-to-file	Option to export the performance response to a text file The file is located at: https://10.103.224.119/xtremapp/[name of file] The exported file type is CSV. Command example: <code>.../api/json/v3/types/performance?entity=Cluster&granularity=one_day&export-to-file=[name of file].csv</code> Note: The file name entered in the export-to-file parameter must contain a valid file name.	No
from-time	The defined commencement time of the report Format: YYYY-MM-DD hh-mm-ss Note: If a from-time is not entered, then the report is defined from the earliest possible time. This is either, from the time the cluster started reporting performance data or up until the maximum time of the stored performance data (up to 2 years). Note: If a from-time is entered, then the time-frame parameter cannot be used. Note: When making direct protocol calls, the reserved characters used in the date format must be encoded. Note: Response date and time are in UTC format. Command example: <code>.../api/json/v3/types/performance?entity=Cluster&from-time=2015-12-01%2000%3A00%3A00&to-time=2015-12-02%2014%3A00%3A00</code>	No

Input Parameter	Description	Mandatory
granularity	Time granularity of the output data Values: • auto • one_day • one_hour (default) • one_minute • ten_minutes • raw Note: If granularity is not included in the command line, the default value for the output is one_hour. Command example: .../api/json/v3/types/performance?entity=Cluster&granularity=one_day	No
limit	Number of row records to be returned The value must be a positive integer. Command example: .../api/json/v3/types/performance?entity=Volume&entity-index=3&entity-name=Finance2&limit=2	No
time-frame	Time frame of the request Values: • custom_time • last_day • last_hour • last_week • last_year • real_time Note: If a time-frame is defined, then the from-time and to-time parameters cannot be used. Command example: /api/json/v3/types/performance?entity=Cluster&time-frame=last_day	No

Performance

Input Parameter	Description	Mandatory
to-time	The defined end time of the report Note: If a to-time is not defined, then the report is defined until the last reported performance data. Note: If a to-time is defined, then the time-frame parameter cannot be used. Format: YYYY-MM-DD hh-mm-ss Note: When making direct protocol calls, the reserved characters used in the date format must be encoded. Note: Response date and time are in UTC format. Command example: <pre>.../api/json/v3/types/performance?entity=Cluster&from-time=2015-12-01%2000%3A00%3A00&to-time=2015-12-02%2014%3A00%3A00</pre>	No

Example Request

```
GET /api/json/v3/types/performance?entity=Target&prop=rd_iops&from-time=2018-01-02%2013%3A20%3A00&granularity=one_hour HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

The above example is a request for data relating to average read-only IOPS taken as of 13:20, January 2 2018, on an hourly basis (granularity).

Filtering Performance Results

As shown in the Example request on page 29, using &prop in the syntax is a general capability that enables you to filter results and list selected output parameters and values of the defined object.

For performance related queries, of which the output can be very long, it is recommended to filter results by entering the specific properties you require.

For example: GET
 /api/json/v3/types/performance?entity=InitiatorGroup&prop=wr_bw&prop=small_iops

The following considerations should be made when using the `&prop` syntax:

- ♦ The query can only contain parameters that belong to the selected entity type.
- ♦ Historical data is collected for the objects and parameters listed in [Table 16](#). Only these values can be listed in the `&prop` output list.

Table 16: Specific Parameters from which Historical Data is Collected

Entity	Parameter	Description
Cluster	acc_io_128kb	Accumulated IO for 128kb blocks
Cluster	acc_io_16kb	Accumulated IO for 16kb blocks
Cluster	acc_io_1kb	Accumulated IO for 1kb blocks
Cluster	acc_io_1mb	Accumulated IO for 1mb blocks
Cluster	acc_io_256kb	Accumulated IO for 256kb blocks
Cluster	acc_io_2kb	Accumulated IO for 2kb blocks
Cluster	acc_io_32kb	Accumulated IO for 32kb blocks
Cluster	acc_io_4kb	Accumulated IO for 4kb blocks
Cluster	acc_io_512b	Accumulated IO for 512b blocks
Cluster	acc_io_512kb	Accumulated IO for 512kb blocks
Cluster	acc_io_64kb	Accumulated IO for 64kb blocks
Cluster	acc_io_8kb	Accumulated IO for 8kb blocks
Cluster	acc_io_gt1mb	Accumulated IO for blocks greater than 1 mb
Cluster	acc_num_of_rd	Accumulated number of read / write I/Os since the Volume was created
Cluster	acc_num_of_rd_io_128kb	Accumulated number of IO reads for 128kb blocks
Cluster	acc_num_of_rd_io_1mb	Accumulated number of IO reads for 1mb blocks
Cluster	acc_num_of_rd_io_256kb	Accumulated number of IO reads for 256kb blocks
Cluster	acc_num_of_rd_io_512kb	Accumulated number of IO reads for 512kb blocks
Cluster	acc_num_of_rd_io_64kb	Accumulated number of IO reads IO for 64kb blocks
Cluster	acc_num_of_rd_io_gt1mb	Accumulated number of IO reads IO for blocks greater than 1 mb
Cluster	acc_num_of_small_rd	Accumulated number of small read I/Os since the Volume was created.
Cluster	acc_num_of_small_wr	Accumulated number of small write I/Os since the Volume was created.
Cluster	acc_num_of_unaligned_rd	Accumulated number of unaligned read I/Os since the Volume was created.

Performance

Entity	Parameter	Description
Cluster	acc_num_of_unaligned_wr	Accumulated number of unaligned write I/Os since the Volume was created
Cluster	acc_num_of_wr	Accumulated number of unaligned write I/Os since the Volume was created
Cluster	acc_num_of_wr_io_128kb	Accumulated number of IO writes for 128kb blocks
Cluster	acc_num_of_wr_io_1mb	Accumulated number of IO writes for 1mb blocks
Cluster	acc_num_of_wr_io_256kb	Accumulated number of IO writes for 256kb blocks
Cluster	acc_num_of_wr_io_32kb	Accumulated number of IO writes for 512kb blocks
Cluster	acc_num_of_wr_io_512kb	Accumulated number of IO writes IO for 64kb blocks
Cluster	acc_num_of_wr_io_64kb	Accumulated number of IO writes IO for blocks greater than 1 mb
Cluster	acc_num_of_wr_io_gt1mb	Accumulated number of IO writes for 128kb blocks
Cluster	acc_size_of_rd	Accumulated size of read I/Os since the Volume was created
Cluster	acc_size_of_wr	Accumulated size of write I/Os since the Volume was created
Cluster	avg_latency	Average latency time measured in μ s.
Cluster	avg_latency_128kb	Average latency time for 128KB blocks, measured in μ s.
Cluster	avg_latency_16kb	Average latency time for 16kb blocks, measured in μ s.
Cluster	avg_latency_1kb	Average latency time for 1kb blocks, measured in μ s
Cluster	avg_latency_1mb	Average latency time for 1mb blocks, measured in μ s.
Cluster	avg_latency_256kb	Average latency time for 256kb blocks, measured in μ s.
Cluster	avg_latency_2kb	Average latency time for 2kb blocks, measured in μ s.
Cluster	avg_latency_32kb	Average latency time for 32kb blocks, measured in μ s.
Cluster	avg_latency_4kb	Average latency time for 4kb blocks, measured in μ s.
Cluster	avg_latency_512b	Average latency time for 512b blocks, measured in μ s.
Cluster	avg_latency_512kb	Average latency time for 512kb blocks, measured in μ s.

Performance

Entity	Parameter	Description
Cluster	avg_latency_64kb	Average latency time for 64kb blocks, measured in μ s.
Cluster	avg_latency_8kb	Average latency time for 8kb blocks, measured in μ s.
Cluster	avg_latency_gt1mb	Average latency time for blocks greater than 1mb, measured in μ s.
Cluster	bw	Bandwidth
Cluster	bw_128kb	Bandwidth / IO for 128kb blocks
Cluster	bw_16kb	Bandwidth / IO for 16kb blocks
Cluster	bw_1kb	Bandwidth / IO for 1kb blocks
Cluster	bw_1mb	Bandwidth / IO for 1mb blocks
Cluster	bw_256kb	Bandwidth / IO for 256kb blocks
Cluster	bw_2kb	Bandwidth / IO for 2kb blocks
Cluster	bw_32kb	Bandwidth / IO for 32kb blocks
Cluster	bw_4kb	Bandwidth / IO for 4kb blocks
Cluster	bw_512b	Bandwidth / IO for 512b blocks
Cluster	bw_512kb	Bandwidth / IO for 512kb blocks
Cluster	bw_64kb	Bandwidth / IO for 64kb blocks
Cluster	bw_8kb	Bandwidth / IO for 128kb blocks
Cluster	bw_by_block	Current bandwidth / IOPs
Cluster	bw_gt1mb	Bandwidth / IO for blocks greater than 1 mb
Cluster	compression_factor	The ratio of total "Unique Data" to total Used Physical Capacity in all clusters managed by XMS.
Cluster	compression_factor_text	The ratio of total "Unique Data" to total Used Physical Capacity in all clusters managed by XMS as text string in the format "X:1", where X is the ratio to one decimal digit. For example, "4.2:1" is a ratio of 4.2 to 1.
Cluster	data_reduction_ratio	The ratio of actual used Volume capacity to used physical capacity in this cluster.
Cluster	data_reduction_ratio_text	The ratio of actual used Volume capacity to used physical capacity in this cluster as text string in the format "X:1", where X is the ratio to one decimal digit. For example, "4.2:1" is a ratio of 4.2 to 1.
Cluster	dedup_ratio	The ratio of actual used Volume capacity to "unique data" written in this cluster.

Performance

Entity	Parameter	Description
Cluster	dedup_ratio text	The ratio of actual used Volume capacity to "unique data" written in this cluster.as text string in the format "X:1", where X is the ratio to one decimal digit. For example, "4.2:1" is a ratio of 4.2 to 1.
Cluster	iops	Current bandwidth / IOPs.
Cluster	iops_128kb	IOPS for 128kb blocks.
Cluster	iops_16kb	IOPS for 16kb blocks.
Cluster	iops_1kb	IOPS for 1kb blocks.
Cluster	iops_1mb	IOPS for 1mb blocks.
Cluster	iops_256kb	IOPS for 256kb blocks.
Cluster	iops_2kb	IOPS for 2kb blocks.
Cluster	iops_32kb	IOPS for 32kb blocks.
Cluster	iops_4kb	IOPS for 4kb blocks.
Cluster	iops_512b	IOPS for 512b blocks.
Cluster	iops_512kb	IOPS for 512kb blocks.
Cluster	iops_64kb	IOPS for 64kb blocks.
Cluster	iops_8kb	IOPS for 8kb blocks.
Cluster	iops_by_block	Total IOPs used for a snap
Cluster	iops_gt1mb	IOPS for gt1mb blocks
Cluster	logical_space_in_use	The space in the clusterthat is actually in use by user (counting non_zero blocks only).
Cluster	num_of_vols	The number of Volumes that belong to this cluster
Cluster	rd_bw	Read Bandwidth
Cluster	rd_bw_128kb	Read bandwidth / IO for 128kb blocks
Cluster	rd_bw_16kb	Read bandwidth / IO for 16kb blocks
Cluster	rd_bw_1kb	Read bandwidth / IO for 1kb blocks
Cluster	rd_bw_1mb	Read bandwidth / IO for 1mb blocks
Cluster	rd_bw_256kb	Read bandwidth / IO for 256kb blocks
Cluster	rd_bw_2kb	Read bandwidth / IO for 2kb blocks
Cluster	rd_bw_32kb	Read bandwidth / IO for 32kb blocks
Cluster	rd_bw_4kb	Read bandwidth / IO for 4kb blocks
Cluster	rd_bw_512b	Read bandwidth / IO for 512b blocks
Cluster	rd_bw_512kb	Read bandwidth / IO for 512kb blocks

Performance

Entity	Parameter	Description
Cluster	rd_bw_64kb	Read bandwidth / IO for 64kb blocks
Cluster	rd_bw_8kb	Read bandwidth / IO for 8kb blocks
Cluster	rd_bw_by_block	Current bandwidth / read IOPs
Cluster	rd_bw_gt1mb	Read bandwidth / IO for 128kb blocks
Cluster	rd_iops	Current bandwidth / read IOPs
Cluster	rd_iops_128kb	Read IOPS for 128kb blocks
Cluster	rd_iops_16kb	Read IOPS for 16kb blocks
Cluster	rd_iops_1kb	Read IOPS for 1kb blocks
Cluster	rd_iops_1mb	Read IOPS for 1mb blocks
Cluster	rd_iops_256kb	Read IOPS for 256kb blocks
Cluster	rd_iops_2kb	Read IOPS for 2kb blocks
Cluster	rd_iops_32kb	Read IOPS for 32kb blocks
Cluster	rd_iops_4kb	Read IOPS for 4kb blocks
Cluster	rd_iops_512b	Read IOPS for 512b blocks
Cluster	rd_iops_512kb	Read IOPS for 512kb blocks
Cluster	rd_iops_64kb	Read IOPS for 64kb blocks
Cluster	rd_iops_8kb	Read IOPS for 8kb blocks
Cluster	rd_iops_by_block	Total read IOPs used for a snap
Cluster	rd_iops_gt1mb	Read IOPS for blocks greater than 1 mb
Cluster	rd_latency	Read latency time measured in μ s.
Cluster	rd_latency_128kb	Read latency time for 128kb blocks measured in μ s.
Cluster	rd_latency_16kb	Read latency time for 16kb blocks measured in μ s.
Cluster	rd_latency_1kb	Read latency time for 1kb blocks measured in μ s.
Cluster	rd_latency_1mb	Read latency time for 1mb blocks measured in μ s.
Cluster	rd_latency_256kb	Read latency time for 256kb blocks measured in μ s.
Cluster	rd_latency_2kb	Read latency time for 2kb blocks measured in μ s.
Cluster	rd_latency_32kb	Read latency time for 32kb blocks measured in μ s.
Cluster	rd_latency_4kb	Read latency time for 4kb blocks measured in μ s.
Cluster	rd_latency_512b	Read latency time for 512b blocks measured in μ s.
Cluster	rd_latency_512kb	Read latency time for 512kb blocks measured in μ s.
Cluster	rd_latency_64kb	Read latency time for 64kb blocks measured in μ s.
Cluster	rd_latency_8kb	Read latency time for 8kb blocks measured in μ s.
Cluster	rd_latency_gt1mb	Read latency time for blocks greater than 1mb measured in μ s.

Performance

Entity	Parameter	Description
Cluster	replication_rd_bw_kbps	Read BW in kbps. An IO is counted when the replication process accesses the SSD to retrieve actual data. Hash handles or full_hashes based IOs are not counted. Only actual data transfer is counted. Reads are counted on the 'source' replication side.
Cluster	replication_rd_iops_16kb	Read IOPS for 16kb blocks
Cluster	replication_wr_bw_kbps	Write BW in kbps. An IO is counted when the replication process accesses the SSD to retrieve actual data. Hash handles or full_hashes based IOs are not counted. Only actual data transfer is counted. Writes are counted on the 'target' replication side.
Cluster	replication_wr_iops_16kb	Write IOPS for 16kb blocks
Cluster	qos_exceeded_bw	Indicates the BW of IOs exceeding the associated QoS Policies. If the QoS Policy is enabled, these IOs are rejected. If the QoS Policy is monitor only, these IOs are counted but not rejected.
Cluster	shared_memory	The total shared memory pool allocated by the system to store the A2H and H2P, in MB.
Cluster	shared_memory_in_use	The amount of the shared memory pool that is currently allocated for A2H and H2P, in MB.
Cluster	shared_memory_in_use_ratio_level	The shared memory utilization level, based on shared_memory_in_use_ratio.
Cluster	small_bw	Current small IO bandwidth
Cluster	small_iops	Small IOPS
Cluster	small_rd_bw	Current small IO read bandwidth
Cluster	small_rd_iops	Current small IO read bandwidth
Cluster	small_wr_bw	Current small IO write bandwidth
Cluster	small_wr_iops	Total small write IOPS
Cluster	thin_provisioning_ratio	The ratio of used capacity to total provisioned capacity
Cluster	thin_provisioning_savings	Percentage of capacity not used.
Cluster	ud_ssd_space	The total physical capacity
Cluster	ud_ssd_space_in_use	The total number of blocks actually used by UD. This is counted after compression.
Cluster	unaligned_bw	Unaligned bandwidth

Performance

Entity	Parameter	Description
Cluster	unaligned_iops	The current bandwidth of unaligned readn and write I/O.
Cluster	unaligned_rd_bw	The current bandwidth of unaligned read I/O.
Cluster	unaligned_rd_iops	The current bandwidth / IOPs of unaligned read I/O that are not small I/O (8kb)
Cluster	unaligned_wr_bw	The current bandwidth of unaligned write I/O.
Cluster	unaligned_wr_iops	The current bandwidth / IOPs of unaligned write I/O that are not small I/O (8kb),
Cluster	vol_size	The total size of all provisioned Volumes in KB.
Cluster	wr_bw	Write Bandwidth
Cluster	wr_bw_128kb	Write bandwidth / IO for 128kb blocks
Cluster	wr_bw_16kb	Write bandwidth / IO for 16kb blocks
Cluster	wr_bw_1kb	Write bandwidth / IO for 1kb blocks
Cluster	wr_bw_1mb	Write bandwidth / IO for 1mb blocks
Cluster	wr_bw_256kb	Write bandwidth / IO for 256kb blocks
Cluster	wr_bw_2kb	Write bandwidth / IO for 2kb blocks
Cluster	wr_bw_32kb	Write bandwidth / IO for 32kb blocks
Cluster	wr_bw_4kb	Write bandwidth / IO for 4kb blocks
Cluster	wr_bw_512b	Write bandwidth / IO for 512b blocks
Cluster	wr_bw_512kb	Write bandwidth / IO for 512kb blocks
Cluster	wr_bw_64kb	Write bandwidth / IO for 64kb blocks
Cluster	wr_bw_8kb	Write bandwidth / IO for 8kb blocks
Cluster	wr_bw_by_block	Current bandwidth / write IOPs
Cluster	wr_bw_gt1mb	Current write bandwidth / IO for blocks greater than 1 mb
Cluster	wr_iops	Current bandwidth / read IOPs
Cluster	wr_iops_128kb	Write IOPS for 128kb blocks
Cluster	wr_iops_16kb	Write IOPS for 16kb blocks
Cluster	wr_iops_1kb	Write IOPS for 1kb blocks
Cluster	wr_iops_1mb	Write IOPS for 1mb blocks
Cluster	wr_iops_256kb	Write IOPS for 256kb blocks
Cluster	wr_iops_2kb	Write IOPS for 2kb blocks
Cluster	wr_iops_32kb	Write IOPS for 32kb blocks
Cluster	wr_iops_4kb	Write IOPS for 4kb blocks
Cluster	wr_iops_512b	Write IOPS for 512b blocks

Performance

Entity	Parameter	Description
Cluster	wr_iops_512kb	Write IOPS for 512kb blocks
Cluster	wr_iops_64kb	Write IOPS for 64kb blocks
Cluster	wr_iops_8kb	Write IOPS for 8kb blocks
Cluster	wr_iops_by_block	Total write IOPs used for a Snapshot of IOPs by block size.
Cluster	wr_iops_gt1mb	Write IOPS for blocks greater than 1 mb
Cluster	wr_latency	Write latency time measured in μ s.
Cluster	wr_latency_128kb	Write latency time for 128kb blocks measured in μ s.
Cluster	wr_latency_16kb	Write latency time for 16kb blocks measured in μ s.
Cluster	wr_latency_1kb	Write latency time for 1kb blocks measured in μ s.
Cluster	wr_latency_1mb	Write latency time for 1mb blocks measured in μ s.
Cluster	wr_latency_256kb	Write latency time for 256kb blocks measured in μ s.
Cluster	wr_latency_2kb	Write latency time for 2kb blocks measured in μ s.
Cluster	wr_latency_32kb	Write latency time for 32kb blocks measured in μ s.
Cluster	wr_latency_4kb	Write latency time for 4kb blocks measured in μ s.
Cluster	wr_latency_512b	Write latency time for 512b blocks measured in μ s.
Cluster	wr_latency_512kb	Write latency time for 512kb blocks measured in μ s
Cluster	wr_latency_64kb	Write latency time for 64kb blocks measured in μ s
Cluster	wr_latency_8kb	Write latency time for 8kb blocks measured in μ s
Cluster	wr_latency_gt1mb	Write latency time for blocks greater than 1mb measured in μ s
ConsistencyGroup	avg_latency	The overall read, write and average latency per time period in KB/Sec.
ConsistencyGroup	acc_num_of_rd	Accumulated number of read / write I/Os since the ConsistencyGroup was created
ConsistencyGroup	acc_num_of_wr	Accumulated number of unaligned write I/Os since the ConsistencyGroup was created
ConsistencyGroup	acc_size_of_rd	Accumulated size of read I/Os since the ConsistencyGroup was created
ConsistencyGroup	acc_size_of_wr	Accumulated size of write I/Os since the ConsistencyGroup was created
ConsistencyGroup	bw	Bandwidth
ConsistencyGroup	iops	Current bandwidth / IOPs.

Performance

Entity	Parameter	Description
ConsistencyGroup	rd_bw	Read Bandwidth
ConsistencyGroup	rd_iops	Read bandwidth / IOPs
ConsistencyGroup	rd_latency	Read latency time measured in μ s.
ConsistencyGroup	wr_bw	Write Bandwidth
ConsistencyGroup	wr_iops	Current bandwidth / read IOPs
ConsistencyGroup	wr_latency	Write latency time measured in μ s.
ConsistencyGroup	qos_exceeded_bw	Indicates the BW of IOs exceeding the associated QoS Policy. If the QoS Policy is enabled, these IOs are rejected. If the QoS Policy is monitor only, these Ios are counted but not rejected.
ConsistencyGroup	qos_exceeded_iops	Indicates the BW of IOPS exceeding the associated QoS Policy. If the QoS Policy is enabled, these IOPS are rejected. If the QoS Policy is monitor only, these Ios are counted but not rejected.
DataProtection Group	rd_bw	Read Bandwidth
DataProtection Group	rd_bw_128kb	Read bandwidth / IO for 128kb blocks
DataProtection Group	rd_bw_16kb	Read bandwidth / IO for 16kb blocks
DataProtection Group	rd_bw_1kb	Read bandwidth / IO for 1kb blocks
DataProtection Group	rd_bw_1mb	Read bandwidth / IO for 1mb blocks
DataProtection Group	rd_bw_256kb	Read bandwidth / IO for 256kb blocks
DataProtection Group	rd_bw_2kb	Read bandwidth / IO for 2kb blocks
DataProtection Group	rd_bw_32kb	Read bandwidth / IO for 32kb blocks
DataProtection Group	rd_bw_4kb	Read bandwidth / IO for 4kb blocks
DataProtection Group	rd_bw_512b	Read bandwidth / IO for 512b blocks

Performance

Entity	Parameter	Description
DataProtection Group	rd_bw_512kb	Read bandwidth / IO for 512kb blocks
DataProtection Group	rd_bw_64kb	Read bandwidth / IO for 64kb blocks
DataProtection Group	rd_bw_8kb	Read bandwidth / IO for 8kb blocks
DataProtection Group	rd_bw_by_block	Current bandwidth / read IOPs
DataProtection Group	rd_bw_gt1mb	Read bandwidth / IO for 128kb blocks
DataProtection Group	rd_iops	Current bandwidth / read IOPs
DataProtection Group	rd_iops_128kb	Read IOPS for 128kb blocks
DataProtection Group	rd_iops_16kb	Read IOPS for 16kb blocks
DataProtection Group	rd_iops_1kb	Read IOPS for 1kb blocks
DataProtection Group	rd_iops_1mb	Read IOPS for 1mb blocks
DataProtection Group	rd_iops_256kb	Read IOPS for 256kb blocks
DataProtection Group	rd_iops_2kb	Read IOPS for 2kb blocks
DataProtection Group	rd_iops_32kb	Read IOPS for 32kb blocks
DataProtection Group	rd_iops_4kb	Read IOPS for 4kb blocks
DataProtection Group	rd_iops_512b	Read IOPS for 512b blocks
DataProtection Group	rd_iops_512kb	Read IOPS for 512kb blocks
DataProtection Group	rd_iops_64kb	Read IOPS for 64kb blocks
DataProtection Group	rd_iops_8kb	Read IOPS for 8kb blocks
DataProtection Group	rd_iops_by_block	Total read IOPs used for a snap

Performance

Entity	Parameter	Description
DataProtection Group	rd_iops_gt1mb	Read IOPS for blocks greater than 1 mb
DataProtection Group	ud_ssd_space	The total physical capacity
DataProtection Group	ud_ssd_space_in_use	The total number of blocks actually used by UD. This is counted after compression
DataProtection Group	wr_bw	Write Bandwidth
DataProtection Group	wr_bw_128kb	Write bandwidth / IO for 128kb blocks
DataProtection Group	wr_bw_16kb	Write bandwidth / IO for 16kb blocks
DataProtection Group	wr_bw_1kb	Write bandwidth / IO for 1kb blocks
DataProtection Group	wr_bw_1mb	Write bandwidth / IO for 1mb blocks
DataProtection Group	wr_bw_256kb	Write bandwidth / IO for 256kb blocks
DataProtection Group	wr_bw_2kb	Write bandwidth / IO for 2kb blocks
DataProtection Group	wr_bw_32kb	Write bandwidth / IO for 32kb blocks
DataProtection Group	wr_bw_4kb	Write bandwidth / IO for 4kb blocks
DataProtection Group	wr_bw_512b	Write bandwidth / IO for 512b blocks
DataProtection Group	wr_bw_512kb	Write bandwidth / IO for 512kb blocks
DataProtection Group	wr_bw_64kb	Write bandwidth / IO for 64kb blocks
DataProtection Group	wr_bw_8kb	Write bandwidth / IO for 8kb blocks
DataProtection Group	wr_bw_by_block	Current bandwidth / write IOPs
DataProtection Group	wr_bw_gt1mb	Current write bandwidth / IO for blocks greater than 1 mb
DataProtection Group	wr_iops	Current bandwidth / read IOPs

Performance

Entity	Parameter	Description
DataProtection Group	wr_iops_128kb	Write IOPS for 128kb blocks
DataProtection Group	wr_iops_16kb	Write IOPS for 16kb blocks
DataProtection Group	wr_iops_1kb	Write IOPS for 1kb blocks
DataProtection Group	wr_iops_1mb	Write IOPS for 1mb blocks
DataProtection Group	wr_iops_256kb	Write IOPS for 256kb blocks
DataProtection Group	wr_iops_2kb	Write IOPS for 2kb blocks
DataProtection Group	wr_iops_32kb	Write IOPS for 32kb blocks
DataProtection Group	wr_iops_4kb	Write IOPS for 4kb blocks
DataProtection Group	wr_iops_512b	Write IOPS for 512b blocks
DataProtection Group	wr_iops_512kb	Write IOPS for 512kb blocks
DataProtection Group	wr_iops_64kb	Write IOPS for 64kb blocks
DataProtection Group	wr_iops_8kb	Write IOPS for 8kb blocks
DataProtection Group	wr_iops_by_block	Total write IOPs used for a snap
DataProtection Group	wr_iops_gt1mb	Write IOPS for blocks greater than 1 mb
DataProtection Group	useful_ssd_space	The sum of the useful SSD space of all the SSDs that belong to the Data Protection Group and are not failed.
Initiator	avg_latency	Average latency time measured in μ s.
Initiator	avg_latency_128kb	Average latency time for 128KB blocks, measured in μ s
Initiator	avg_latency_16kb	Average latency time for 16kb blocks, measured in μ s.
Initiator	avg_latency_1kb	Average latency time for 1kb blocks, measured in μ s

Performance

Entity	Parameter	Description
Initiator	avg_latency_1mb	Average latency time for 1mb blocks, measured in μ s
Initiator	avg_latency_256kb	Average latency time for 256kb blocks, measured in μ s.
Initiator	avg_latency_2kb	Average latency time for 2kb blocks, measured in μ s.
Initiator	avg_latency_32kb	Average latency time for 32kb blocks, measured in μ s.
Initiator	avg_latency_4kb	Average latency time for 4kb blocks, measured in μ s.
Initiator	avg_latency_512b	Average latency time for 512b blocks, measured in μ s.
Initiator	avg_latency_512kb	Average latency time for 512kb blocks, measured in μ s.
Initiator	avg_latency_64kb	Average latency time for 64kb blocks, measured in μ s.
Initiator	avg_latency_8kb	Average latency time for 8kb blocks, measured in μ s.
Initiator	avg_latency_gt1mb	Average latency time for blocks greater than 1mb, measured in μ s.
Initiator	bw	Bandwidth
Initiator	iops	Current bandwidth / IOPs
Initiator	rd_bw	Read Bandwidth
Initiator	rd_iops	Current bandwidth / read IOPs
Initiator	rd_latency	Read latency time measured in μ s.
Initiator	rd_latency_128kb	Read latency time for 128kb blocks measured in μ s.
Initiator	rd_latency_16kb	Read latency time for 16kb blocks measured in μ s.
Initiator	rd_latency_1kb	Read latency time for 1kb blocks measured in μ s.
Initiator	rd_latency_1mb	Read latency time for 1mb blocks measured in μ s.
Initiator	rd_latency_256kb	Read latency time for 256kb blocks measured in μ s.
Initiator	rd_latency_2kb	Read latency time for 2kb blocks measured in μ s.
Initiator	rd_latency_32kb	Read latency time for 32kb blocks measured in μ s.
Initiator	rd_latency_4kb	Read latency time for 4kb blocks measured in μ s.
Initiator	rd_latency_512b	Read latency time for 512b blocks measured in μ s.
Initiator	rd_latency_512kb	Read latency time for 512kb blocks measured in μ s.
Initiator	rd_latency_64kb	Read latency time for 64kb blocks measured in μ s.

Performance

Entity	Parameter	Description
Initiator	rd_latency_8kb	Read latency time for 8kb blocks measured in μ s.
Initiator	rd_latency_gt1mb	Read latency time for blocks greater than 1mb measured in μ s.
Initiator	small_bw	Current small IO bandwidth
Initiator	small_iops	Small IOPs
Initiator	small_rd_bw	Current small IO read bandwidth
Initiator	small_rd_iops	Current small IO read bandwidth
Initiator	small_wr_bw	Current small IO write bandwidth
Initiator	small_wr_iops	Total small write IOPs
Initiator	unaligned_bw	Unaligned bandwidth
Initiator	unaligned_iops	The current bandwidth of unaligned readn and write I/O.
Initiator	unaligned_rd_bw	The current bandwidth of unaligned read I/O.
Initiator	unaligned_rd_iops	The current bandwidth / IOPs of unaligned read I/O that are not small I/O (8kb)
Initiator	unaligned_wr_bw	The current bandwidth of unaligned write I/O.
Initiator	unaligned_wr_iops	The current bandwidth / IOPs of unaligned write I/O that are not small I/O (8kb),
Initiator	wr_bw	Write Bandwidth
Initiator	wr_iops	Current bandwidth / read IOPs
Initiator	wr_latency	Write latency time measured in μ s.
Initiator	wr_latency_128kb	Write latency time for 128kb blocks measured in μ s.
Initiator	wr_latency_16kb	Write latency time for 16kb blocks measured in μ s.
Initiator	wr_latency_1kb	Write latency time for 1kb blocks measured in μ s.
Initiator	wr_latency_1mb	Write latency time for 1mb blocks measured in μ s.
Initiator	wr_latency_256kb	Write latency time for 256kb blocks measured in μ s.
Initiator	wr_latency_2kb	Write latency time for 2kb blocks measured in μ s.
Initiator	wr_latency_32kb	Write latency time for 32kb blocks measured in μ s.
Initiator	wr_latency_4kb	Write latency time for 4kb blocks measured in μ s.
Initiator	wr_latency_512b	Write latency time for 512b blocks measured in μ s
Initiator	wr_latency_512kb	Write latency time for 512kb blocks measured in μ s
Initiator	wr_latency_64kb	Write latency time for 64kb blocks measured in μ s
Initiator	wr_latency_8kb	Write latency time for 8kb blocks measured in μ s

Performance

Entity	Parameter	Description
Initiator	wr_latency_gt1mb	Write latency time for blocks greater than 1mb measured in μ s
Initiator	qos_exceeded_bw	Indicates the BW of IOs exceeding the associated QoS Policy. If the QoS Policy is enabled, these IOs are rejected. If the QoS Policy is monitor only, these los are counted but not rejected.
Initiator	qos_exceeded_iops	Indicates the BW of IOPS exceeding the associated QoS Policy. If the QoS Policy is enabled, these IOPS are rejected. If the QoS Policy is monitor only, these los are counted but not rejected.
InitiatorGroup	acc_num_of_rd	Accumulated number of read / write I/Os since the Volume was created.
InitiatorGroup	acc_num_of_small_rd	Accumulated number of small read I/Os since the Volume was created.
InitiatorGroup	acc_num_of_small_wr	Accumulated number of small write I/Os since the Volume was created.
InitiatorGroup	acc_num_of_unaligned_rd	Accumulated number of unaligned read I/Os since the Volume was created
InitiatorGroup	acc_num_of_unaligned_wr	Accumulated number of unaligned write I/Os since the Volume was created
InitiatorGroup	acc_num_of_wr	Accumulated number of unaligned write I/Os since the Volume was created
InitiatorGroup	acc_size_of_rd	Accumulated size of read I/Os since the Volume was created
InitiatorGroup	acc_size_of_wr	Accumulated size of write I/Os since the Volume was created
InitiatorGroup	bw	Bandwidth
InitiatorGroup	iops	Current bandwidth / IOPs
InitiatorGroup	rd_bw	Read Bandwidth
InitiatorGroup	rd_iops	Current bandwidth / read IOPs
InitiatorGroup	small_bw	Current small IO bandwidth
InitiatorGroup	small_iops	Small IOPs
InitiatorGroup	small_rd_bw	Current small IO read bandwidth
InitiatorGroup	small_rd_iops	Current small IO read bandwidth
InitiatorGroup	small_wr_bw	Current small IO write bandwidth
InitiatorGroup	small_wr_iops	Total small write IOPs
InitiatorGroup	unaligned_bw	Unaligned bandwidth

Performance

Entity	Parameter	Description
InitiatorGroup	unaligned_iops	The current bandwidth of unaligned readn and write I/O.
InitiatorGroup	unaligned_rd_bw	The current bandwidth of unaligned read I/O.
InitiatorGroup	unaligned_rd_iops	The current bandwidth / IOPs of unaligned read I/O that are not small I/O (8kb),
InitiatorGroup	unaligned_wr_bw	The current bandwidth of unaligned write I/O.
InitiatorGroup	unaligned_wr_iops	The current bandwidth / IOPs of unaligned write I/O that are not small I/O (8kb),
InitiatorGroup	wr_bw	Write Bandwidth
InitiatorGroup	wr_iops	Current bandwidth / read IOPs
InitiatorGroup	qos_exceeded_bw	Indicates the BW of IOs exceeding the associated QoS Policy. If the QoS Policy is enabled, these IOs are rejected. If the QoS Policy is monitor only, these los are counted but not rejected.
InitiatorGroup	qos_exceeded_iops	Indicates the BW of IOPS exceeding the associated QoS Policy. If the QoS Policy is enabled, these IOPS are rejected. If the QoS Policy is monitor only, these los are counted but not rejected.
ReplicationSession	acc_num_of_rd	Accumulated number of read / write I/Os since the ReplicationTarget was created.
ReplicationSession	acc_num_of_wr	Accumulated number of unaligned write I/Os since the ReplicationTarget was created
ReplicationSession	acc_size_of_rd	Accumulated size of read I/Os since the ReplicationTarget was created
ReplicationSession	acc_size_of_wr	Accumulated size of write I/Os since the ReplicationTarget was created
ReplicationSession	avg_latency_16kb	Average latency time for 16kb blocks, measured in μ s.
ReplicationSession	bw	Bandwidth
ReplicationSession	eth_kbytes_rx	The total Kbytes received.
ReplicationSession	eth_kbytes_tx	The total Kbytes transmitted.
ReplicationSession	eth_pkt_rx	The number of packets received.
ReplicationSession	eth_pkt_rx_crc_error	The number of packets received with CRC errors.

Performance

Entity	Parameter	Description
ReplicationSession	eth_pkt_rx_no_buffer_error	The number of packets disgarded on receipt.
ReplicationSession	eth_pkt_tx	The number of packets transmitted.
ReplicationSession	eth_pkt_tx_error	The number of packets failed to transmit.
ReplicationSession	iops	IOPs.
ReplicationSession	rd_bw	Read Bandwidth
ReplicationSession	rd_latency	Read latency time measured in μ s.
ReplicationSession	wr_bw	Write Bandwidth
ReplicationSession	wr_iops	Write IOPs
ReplicationSession	wr_latency	Write latency time measured in μ s.
SnapshotGroup	logical_space_in_use	The space in the cluster that is actually in use by user (counting non_zero blocks only).
SnapshotGroup	num_of_vols	The number of Volumes that belong to this SnapshotGroup.
SnapshotGroup	thin_provisioning_ratio	The ratio of used capacity to total provisioned capacity
SSD	bw	Bandwidth
SSD	iops	Current bandwidth / IOPs
SSD	percent_endurance_remaining	The percent endurance remaining as reported by the system for a SSD. Some SSD manufactures provide this figure. For other SSDs, this percentage may need to be calculated. If the SSD reports endurance_percent_used and not remaining, for example a new SSD reports 0, then the calculation will be $100\_endurance\_percent\_used$.

Performance

Entity	Parameter	Description
SSD	percent_endurance_remaining_level	Indicates the percent endurance threshold. Values: - ok – endurance is within thresholds. - limited – endurance is between 5% and 10% - very_limited – endurance is below 5% and more than 0% - no_remaining – endurance is 0% (none remaining)
SSD	rd_bw	Read Bandwidth
SSD	rd_iops	Current bandwidth / read IOPs
SSD	ssd_space_in_use	SSD space currently in use
SSD	useful_ssd_space	The size of the SSD after taking into account RAID overhead.
SSD	wr_bw	Write Bandwidth
SSD	wr_iops	Current bandwidth / read IOPs
Target	avg_latency	Average latency time measured in μ s.
Target	avg_latency_128kb	Average latency time for 128KB blocks, measured in μ s.
Target	avg_latency_16kb	Average latency time for 16kb blocks, measured in μ s.
Target	avg_latency_1kb	Average latency time for 1kb blocks, measured in μ s.
Target	avg_latency_1mb	Average latency time for 1mb blocks, measured in μ s.
Target	avg_latency_256kb	Average latency time for 256kb blocks, measured in μ s.
Target	avg_latency_2kb	Average latency time for 2kb blocks, measured in μ s.
Target	avg_latency_32kb	Average latency time for 32kb blocks, measured in μ s.
Target	avg_latency_4kb	Average latency time for 4kb blocks, measured in μ s.
Target	avg_latency_512b	Average latency time for 512b blocks, measured in μ s.
Target	avg_latency_512kb	Average latency time for 512kb blocks, measured in μ s..

Performance

Entity	Parameter	Description
Target	avg_latency_64kb	Average latency time for 64kb blocks, measured in μ s.
Target	avg_latency_8kb	Average latency time for 8kb blocks, measured in μ s.
Target	avg_latency_gt1mb	Average latency time for blocks greater than 1mb, measured in μ s.
Target	bw	Bandwidth
Target	fc_dumped_frames	The FC ports dumped framers counter.
Target	fc_invalid_crc_count	The FC ports invalid CRC counter
Target	fc_link_failure_count	The FC ports link failure counter.
Target	fc_loss_of_signal_count	The FC ports loss of signal counter.
Target	fc_loss_of_sync_count	The FC ports lose of sync counter.
Target	fc_prim_seq_prot_err_count	The FC ports primary sequence error counter.
Target	iops	Current bandwidth / IOPs
Target	rd_bw	Read Bandwidth
Target	rd_iops	Current bandwidth / read IOPs
Target	rd_latency	Read latency time measured in μ s.
Target	rd_latency_128kb	Read latency time for 128kb blocks measured in μ s.
Target	rd_latency_16kb	Read latency time for 16kb blocks measured in μ s.
Target	rd_latency_1kb	Read latency time for 1kb blocks measured in μ s.
Target	rd_latency_1mb	Read latency time for 1mb blocks measured in μ s.
Target	rd_latency_256kb	Read latency time for 256kb blocks measured in μ s.
Target	rd_latency_2kb	Read latency time for 2kb blocks measured in μ s.
Target	rd_latency_32kb	Read latency time for 32kb blocks measured in μ s.
Target	rd_latency_4kb	Read latency time for 4kb blocks measured in μ s.
Target	rd_latency_512b	Read latency time for 512b blocks measured in μ s.
Target	rd_latency_512kb	Read latency time for 512kb blocks measured in μ s.
Target	rd_latency_64kb	Read latency time for 64kb blocks measured in μ s. for 64kb blocks
Target	rd_latency_8kb	Read latency time for 8kb blocks measured in μ s.
Target	rd_latency_gt1mb	Read latency time for blocks greater than 1mb measured in μ s.
Target	small_bw	Current small IO bandwidth
Target	small_iops	Small IOPs

Performance

Entity	Parameter	Description
Target	small_rd_bw	Current small IO read bandwidth
Target	small_rd_iops	Current small IO read bandwidth
Target	small_wr_bw	Current small IO write bandwidth
Target	small_wr_iops	Total small write IOPs
Target	unaligned_bw	Unaligned bandwidth
Target	unaligned_iops	The current bandwidth of unaligned readn and write I/O.
Target	unaligned_rd_bw	The current bandwidth of unaligned read I/O.
Target	unaligned_rd_iops	The current bandwidth / IOPs of unaligned read I/O that are not small I/O (8kb),
Target	unaligned_wr_bw	The current bandwidth of unaligned write I/O.
Target	unaligned_wr_iops	The current bandwidth / IOPs of unaligned write I/O that are not small I/O (8kb),
Target	wr_bw	Write Bandwidth
Target	wr_iops	Current bandwidth / read IOPs
Target	wr_latency	Write latency time measured in μ s.
Target	wr_latency_128kb	Write latency time for 128kb blocks measured in μ s.
Target	wr_latency_16kb	Write latency time for 16kb blocks measured in μ s.
Target	wr_latency_1kb	Write latency time for 1kb blocks measured in μ s.
Target	wr_latency_1mb	Write latency time for 1mb blocks measured in μ s.
Target	wr_latency_256kb	Write latency time for 256kb blocks measured in μ s.
Target	wr_latency_2kb	Write latency time for 2kb blocks measured in μ s.
Target	wr_latency_32kb	Write latency time for 32kb blocks measured in μ s.
Target	wr_latency_4kb	Write latency time for 4kb blocks measured in μ s.
Target	wr_latency_512b	Write latency time for 512b blocks measured in μ s
Target	wr_latency_512kb	Write latency time for 512kb blocks measured in μ s
Target	wr_latency_64kb	Write latency time for 64kb blocks measured in μ s
Target	wr_latency_8kb	Write latency time for 8kb blocks measured in μ s
Target	wr_latency_gt1mb	Write latency time for blocks greater than 1mb measured in μ s
TargetGroup	acc_num_of_rd	Accumulated number of read / write I/Os since the ReplicationTarget was created.
TargetGroup	acc_num_of_small_rd	Accumulated number of small read I/Os since the Volume was created.

Performance

Entity	Parameter	Description
TargetGroup	acc_num_of_small_wr	Accumulated number of small write I/Os since the Volume was created.
TargetGroup	acc_num_of_unaligned_rd	Accumulated number of unaligned read I/Os since the Volume was created
TargetGroup	acc_num_of_unaligned_wr	Accumulated number of unaligned write I/Os since the Volume was created
TargetGroup	acc_num_of_wr	Accumulated number of unaligned write I/Os since the ReplicationTarget was created
TargetGroup	bw	Bandwidth
TargetGroup	iops	IOPS
TargetGroup	rd_bw	Read Bandwidth
TargetGroup	rd_iops	Read IOPS
TargetGroup	small_bw	Current small IO bandwidth
TargetGroup	small_iops	Small IOPS
TargetGroup	small_rd_bw	Current small IO read bandwidth
TargetGroup	small_rd_iops	Current small IO read bandwidth
TargetGroup	small_wr_bw	Current small IO write bandwidth
TargetGroup	small_wr_iops	Current small IO write bandwidth
TargetGroup	unaligned_bw	Unaligned bandwidth
TargetGroup	unaligned_iops	The current bandwidth of unaligned readn and write I/O.
TargetGroup	unaligned_rd_bw	The current bandwidth of unaligned read I/O.
TargetGroup	unaligned_rd_iops	The current bandwidth / IOPS of unaligned read I/O that are not small I/O (8kb),
TargetGroup	unaligned_wr_bw	The current bandwidth of unaligned write I/O.
TargetGroup	unaligned_wr_iops	The current bandwidth / IOPS of unaligned write I/O that are not small I/O (8kb),
TargetGroup	wr_bw	Write Bandwidth
TargetGroup	wr_iops	Write IOPS
Volume	acc_num_of_rd	Accumulated number of read / write I/Os since the Volume was created.
Volume	acc_num_of_small_rd	Accumulated number of small read I/Os since the Volume was created.
Volume	acc_num_of_small_wr	Accumulated number of small write I/Os since the Volume was created.
Volume	acc_num_of_unaligned_rd	Accumulated number of unaligned read I/Os since the Volume was created

Performance

Entity	Parameter	Description
Volume	acc_num_of_unaligned_wr	Accumulated number of unaligned write I/Os since the Volume was created
Volume	acc_num_of_wr	Accumulated number of unaligned write I/Os since the Volume was created
Volume	acc_size_of_rd	Accumulated size of read I/Os since the Volume was created
Volume	acc_size_of_wr	Accumulated size of write I/Os since the Volume was created
Volume	avg_latency	Average latency time measured in μ s.
Volume	bw	Bandwidth
Volume	iops	Current bandwidth / IOPs
Volume	logical_space_in_use	The space in the cluster that is actually in use by user (counting non_zero blocks only).
Volume	rep_bw	Bandwidth (in MB/s) of all replication IO for this Volume. Calculated over a short window (few seconds)
Volume	qos_exceeded_bw	Indicates the BW of IOs exceeding the associated QoS Policy. If the QoS Policy is enabled, these IOs are rejected. If the QoS Policy is monitor only, these IOs are counted but not rejected.
Volume	qos_exceeded_iops	Indicates the BW of IOPS exceeding the associated QoS Policy. If the QoS Policy is enabled, these IOPS are rejected. If the QoS Policy is monitor only, these IOs are counted but not rejected.
Volume	replication_rd_bw_kbps	Read BW in kbps. An IO is counted when the replication process accesses the SSD to retrieve actual data. Hash handles or full_hashes based IOs are not counted. Only actual data transfer is counted. Reads are counted on the 'source' replication side.
Volume	replication_rd_iops_16kb	Read IOPS for 16kb blocks
Volume	replication_wr_bw_kbps	Write BW in kbps. An IO is counted when the replication process accesses the SSD to retrieve actual data. Hash handles or full_hashes based IOs are not counted. Only actual data transfer is counted. Writes are counted on the 'target' replication side.
Volume	replication_wr_iops_16kb	Write IOPS for 16kb blocks
Volume	rd_bw	Read Bandwidth

Performance

Entity	Parameter	Description
Volume	rd_iops	Current bandwidth / read IOPs
Volume	rd_latency	Read latency time measured in μ s.
Volume	small_bw	Current small IO bandwidth
Volume	small_io_ratio	The accumulated number of small I/Os divided by the total accumulated number of I/Os to the Volume as a in percent
Volume	small_io_ratio_level	Indicates the small IO ratio level and is triggered when the level changes. Values: - ok - unaligned_io_ratio is less than 5% or if unaligned_io_alerts is set to disabled - low - more than threshold of the IO are unaligned and the unaligned_io_ratio is greater than 5% - medium - more than medium threshold of the IO are unaligned and the unaligned io_ratio is greater than 20% - high - more than high threshold of the IO are unaligned and the unaligned io_ratio greater than 30%
Volume	small_iops	Small IOPs
Volume	small_rd_bw	Current small IO read bandwidth
Volume	small_rd_iops	Current small IO read bandwidth
Volume	small_wr_bw	Current small IO write bandwidth
Volume	small_wr_iops	Total small write IOPs
Volume	unaligned_bw	Unaligned bandwidth
Volume	unaligned_io_ratio	The accumulated number of unaligned I/Os divided by the total accumulated number of I/Os to the Volume as a in percent.
Volume	unaligned io_ratio_level	Indicates the unaligned IO ratio level and is triggered when the level changes. Values: - ok - small_io_ratio is less than 5% or if small_io_alerts is set to disabled - low - more than threshold of the IO are small and the small_io_ratio is greater than 5% - medium - more than medium threshold of the IO are small and the small_io_ratio is greater than 20% - high - more than high threshold of the IO are small and the small_io_ratio greater than 30%

Performance

Entity	Parameter	Description
Volume	unaligned_iops	The current bandwidth of unaligned readn and write I/O.
Volume	unaligned_rd_bw	The current bandwidth of unaligned read I/O.
Volume	unaligned_rd_iops	The current bandwidth / IOPs of unaligned read I/O that are not small I/O (8kb),
Volume	unaligned_wr_bw	The current bandwidth of unaligned write I/O.
Volume	unaligned_wr_iops	The current bandwidth / IOPs of unaligned write I/O that are not small I/O (8kb),
Volume	wr_bw	Write Bandwidth
Volume	wr_iops	Current bandwidth / read IOPs
Volume	wr_latency	Write latency time measured in μ s.
XEnv	cpu_usage	The X-Env CPU usage as a in percent
Xms	bw	Bandwidth
Xms	bw_by_block	Current bandwidth / IOPs processed. The properties rd_iops_by_block, wr_iops_by_block, rd_bw_by_block, wr_bw_by_block are used to get a Snapshot of the totals by block size. Bandwidth by block is an aggregation by Volume. Block sizes of 512 bytes are converted to KB.
Xms	iops	IOPS
Xms	iops_by_block	IOPS by block
Xms	rd_bw	Read bandwidth
Xms	rd_bw_by_block	Read bandwidth by block
Xms	rd_iops	Read IOPS
Xms	rd_iops_by_block	Read IOPS by block
Xms	rd_latency	Read latency
Xms	wr_bw	Write bandwidth
Xms	wr_bw_by_block	Write bandwidth by block
Xms	wr_iops	Write IOPS
Xms	wr_iops_by_block	Write IOPS by block
Xms	wr_latency	Write latency
Xms	free_disk_space_secondary	The amount of free disk_space on the secondary XMS partition (/var/common) available for XMS within the partition_soft_limit_xms_secondary.
Xms	free_memory	The amount of free memory on XMS systemin KB

Entity	Parameter	Description
Xms	free_space	The amount of disk free space on XMS system for the root partition (/) in KB.
Xms	num_of_vols	The number of Volumes that belong to XMS.

For more information see [Performance Output](#) on page 349.

For general details about request syntax, see [Generating Output and Filtering](#) on page 22.

Note: When making direct protocol calls, you must specifically encode all reserved characters. The examples shown in this guide were achieved using a client library that automatically encodes the reserved URL characters.

Performance Output

The performance for each entity type contains two sets of output parameters. These output parameters (members) for each selected entity, are displayed at the end of the query. The sets of output parameters are the following:

- Universal output parameters — These are output parameters that apply to all performance entity types. The output parameters are: timestamp (in UTC time format), guid, name and index.
- Specific output parameter — These are output parameters unique to the specified performance entity type.

After running a query, the output displays all the values that apply to the selected entity. The values are presented without the parameter name headers. The parameter names are displayed once at the end of the output. The parameter values (members) are in the same order of the listed parameter names.

For example, the query:

```
GET /api/json/v3/types/performance?entity=InitiatorGroup'
```

generates the following output:

Note: Partial output is shown including "members" only.

Performance

```

{
  "counters": [
    [
      1530770400000,
      "769248090ea14dd284e304c0f331e7ed",
      "lgdrm2156",
      2,
      11803.6402777778,
      1912860.8680555599,
      16414.9569444444,
      14064.7888888889,
      0.0,
      324182.747222222,
      526811.670833333,
      0.0,
      7014.6736111111,
      737038.286111111,
      1175822.58194444,
      0,
      0,
      0,
      3414.5333333333,
      5686,
      4053,
      0,
      0,
      9282,
      5905,
      25510,
      16782,
      42292,
      0
    ],
    ...
    [
      1530774000000,
      "886c868811a94a7c9b1b7916623b9e18",
      "lgdrm2155",
      1,
      11153.9162011173,
      1437907.05027933,
      49561.1759776536,
      34586.624301676,
      0.0,
      218466.261173184,
      250331.388268156,
      0.0,
      7187.406424581,
      587476.423184358,
      850430.6270949719,
      0,
      0,
      0,
      3605.0502793296,
      8691,
      6833,
      0,

```

```

    0,
    6779,
    5456,
    23482,
    17650,
    41133,
    0
  ],
  ],
  "members": [
    "timestamp",
    "guid",
    "name",
    "index",
    "avg_wr_latency",
    "avg_bw",
    "avg_small_rd_bw",
    "avg_small_wr_bw",
    "avg_small_bw",
    "avg_unaligned_wr_bw",
    "avg_unaligned_rd_bw",
    "avg_unaligned_bw",
    "avg_avg_latency",
    "avg_wr_bw",
    "avg_rd_bw",
    "avg_qos_exceeded_bw",
    "avg_qos_effective_burst_bw",
    "avg_qos_effective_max_bw",
    "avg_rd_latency",
    "avg_small_rd_iops",
    "avg_small_wr_iops",
    "avg_small_iops",
    "avg_unaligned_iops",
    "avg_unaligned_rd_iops",
    "avg_unaligned_wr_iops",
    "avg_rd_iops",
    "avg_wr_iops",
    "avg_iops",
    "avg_qos_exceeded_iops"
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1076/api/json/v2/types/performance",
      "rel": "self"
    }
  ],
  "granularity": "one_hour"
}

```

Aggregation Type Suffix

One of the object performance input parameters used to filter the performance query is aggregation-type, which performs an aggregation function of the request. See [Performance Input Parameters](#) on page 319 for the table of parameters.

Performance

Possible values are: min, max or avg

Depending on the aggregation type defined in the request, each output metric is prefixed with either avg__, min__ or max__.

Below are examples of output values:

- ♦ avg__rd_iops
- ♦ min__rd_iops
- ♦ max__rd_iops

Quality of Service (QoS) Policies

Viewing the List of Quality of Service (QoS) Policies

GET /api/json/v3/types/qos-policies

This command (GET /api/json/v3/types/qos-policies) displays the list of Quality of Service (QoS) Policies.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example Request

GET /api/json/v3/types/qos-policies HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Quality of Service (QoS) Policies

Response

```
{
  "qos-policies": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/qos-
policies/fad078ed1cdf4f64bf974141389b0c35",
      "name": "QoS-Policy-001",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/qos-
policies/35c2188d3e4a4177b4c3de945695f2da",
      "name": "QoS-Policy-0012",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/qos-
policies/73e7ff8d38ff41619e46bf2fa5a613fa",
      "name": "QoS-Policy-0013",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/qos-
policies/7954e17c26d248db981cc1b5fc0cc91c",
      "name": "QoS-Policy-004",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/qos-
policies/0b54fee7546948ab81fe40de6bbe0013",
      "name": "QoS-Policy-005",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/qos-
policies/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of a Quality of Service (QoS) Policy

GET /api/json/v3/types/qos-policies/<parameter (qos-policy-guid or qos-policy-index or ?name=qos-policy-name)>

This command (GET /api/json/v3/types/qos-policies/<parameter [qos-policy-guid or qos-policy-index or ?name=qos-policy-name]>) displays the details of the selected Quality of Service (QoS) Policy.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
qos-policy-guid	A unique identifier for the QoS Policy.	Select one of the following: - qos-policy-guid - qos-policy-index - qos-policy-name
qos-policy-index	The index of the QoS Policy.	
qos-policy-name	The name of the QoS Policy.	

Output Parameter	Description
burst-percentage	The QoS Policy burst limit as a percentage. If specified by the user, this is the percentage above the maximum limit (the maximum number of IOPS/BW) that is allowed to process over a short period of time.
guid	The globally unique Id of this QoS Policy object.
index	The index of this QoS Policy object.
io-size	The QoS Policy IO-size in bytes. If io-size is specified by the user, io-size is used with max-iops and limit-type to determine the maximum sustained bandwidth allowed to process over an extended period of time. This parameter is used only when the maximum limit is specified in IOPS units. The values are 512b, 1kb, 2kb, 4kb, 8kb, 6kb, 32kb, 64kb, 128kb, 256kb, 512kb and 1mb.
limit-type	Indicates the type of limit applied to objects assigned this QoS Policy. Values: - fixed – the QoS Policy's specified limits are applied to the associated objects (the specified limits are the effective limits). - adaptive – the QoS Policy's specified limits are per provisioned GB and calculated according to the associated object's size (the calculated limits are the effective limits). adaptive limits apply to Volumes and Consistency Groups, only.

Quality of Service (QoS) Policies

Output Parameter	Description
max-bw	If max-bw is specified by the user, this is the QoS Policy's maximum sustained bandwidth [KB/s] that is allowed to process over an extended period of time depending upon the limit-type. If limit-type is fixed, the maximum bandwidth is max-bw. If limit-type is adaptive, the maximum bandwidth is max-bw per 1GB. The value for max-bw must be suffixed by one of the following: • k – indicates KBps, for example "1024k" • m – indicates MBps, for example "100m" Note: The user can specify either max-bw or max-iops. The QoS Policy's maximum sustained bandwidth is determined by which of the two that the user specifies.
max-iops	If max-iops is specified by the user, this is the QoS Policy's maximum number of IOPS and the maximum sustained bandwidth that is allowed to process over an extended period of time is max-iops times io-size depending upon the limit-type. If limit-type is fixed, then the maximum number of IOPS is max-iops. If the limit-type is adaptive, then the maximum number of IOPS is max-iops per 1GB. Note: The user can specify either max-bw or max-iops. The QoS Policy's maximum sustained bandwidth is determined by which of the two that the user specifies.
name	The name of this QoS Policy object.
num-references	The number of objects associated to this QoS Policy.
object-list	The list of all objects associated with this QoS policy, including Volumes, Consistency Groups, and Initiator-Groups.
qos-policy-id	For this QoS Policy, a tuple array containing the following parameters (in the following order): the QoS Policy object GUID identifier, the QoS Policy name, and the QoS Policy index.
sys-id	For the cluster to which this QoS Policy belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.

Example Request

```
GET /api/json/v3/types/qos-policies/0b54fee7546948ab81fe40de6bbe0013 HTTP/1.1
Host: vxms-xbrickdrml652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "max-bw": 0,
    "index": 18,
    "name": "QoS-Policy-005",
    "io-size": 262144,
    "burst-percentage": 15,
    "limit-type": "fixed",
    "object-list": [],
    "num-references": 0,
    "guid": "0b54fee7546948ab81fe40de6bbe0013",
    "max-iops": 1000000,
    "sys-id": [
      "4b7891fe67be4c00b7c9c194c54150eb",
      "xbrickdrm1652",
      1
    ],
    "qos-policy-id": [
      "0b54fee7546948ab81fe40de6bbe0013",
      "QoS-Policy-005",
      18
    ]
  },
  "links": [
    {
      "guid": "0b54fee7546948ab81fe40de6bbe0013",
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/qos-
policies/0b54fee7546948ab81fe40de6bbe0013",
      "rel": "self"
    }
  ]
}
```

Quality of Service (QoS) Policies

Add a Quality of Service (QoS) Policy

POST /api/json/v3/types/qos-policies

This command (POST /api/json/v3/types/qos-policies) enables you to create a Quality of Service (QoS) Policy.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
limit-type	Indicates the type of limit applied to objects assigned this QoS Policy. Values: - fixed – the QoS Policy's specified limits are applied to the associated objects (the specified limits are the effective limits). - adaptive – the QoS Policy's specified limits are per provisioned GB and calculated according to the associated object's size (the calculated limits are the effective limits). Note: adaptive limit-types apply to Volumes and Consistency Groups, only.	Yes
max-bw	The QoS Policy's maximum bandwidth [KB/s]. This is the maximum sustained bandwidth that will be allowed to process over an extended period of time. The value is must be suffixed by one of the following: - k – indicates KBps, for example "1024k" - m – indicates MBps, for example "100m"	Select one of the following: - max-bw - max-iops
max-iops	The QoS Policy's maximum number of IOPS. Note: If max-iops is specified, io-size must also be specified.	
qos-policy-name	The name of the new QoS Policy.	Yes

Quality of Service (QoS) Policies

burst-percentage	The QoS Policy burst limit as a percentage. This limit is the percentage above the maximum IOPS/BW (max-iops parameter divided by the max-bw parameter) that is allowed to process over a short period of time.	No
io-size	The QoS Policy IO-size in bytes. This parameter is used only when the maximum limit is specified in IOPS units. The values are 512b, 1kb, 2kb, 4kb, 8kb, 6kb, 32kb, 64kb, 128kb, 256kb, 512kb and 1mb. Note: If max-iops is specified, io-size must also be specified.	No

Example Request

POST /api/json/v3/types/qos-policies HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{ "qos-policy-name": "QoS-Policy-001", "limit-type": "adaptive", "max-bw": "1024k", "burst-percentage": 10, "io-size": "512kb" }

Response

```
{
  "links": [
    {
      "guid": "fad078ed1cdf4f64bf974141389b0c35",
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/qos-policies/fad078ed1cdf4f64bf974141389b0c35",
      "rel": "self"
    }
  ]
}
```

Quality of Service (QoS) Policies

Modifying a Quality of Service (QoS) Policy

PUT /api/json/v3/types/qos-policies/<parameter (qos-policy-guid or qos-policy-index or ?name=qos-policy-name)>

This command (PUT /api/json/v3/types/qos-policies/<parameter [qos-policy-guid or qos-policy-index or ?name=qos-policy-name]>) enables you to modify a Quality of Service (QoS) Policy.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
qos-policy-guid	A unique identifier for the QoS Policy.	Select one of the following: - qos-policy-guid - qos-policy-index - qos-policy-name
qos-policy-index	The index of the QoS Policy.	
qos-policy-name	The name of the QoS Policy.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
burst-percentage	The QoS Policy burst limit as a percentage. This limit is the percentage above the maximum IOPS/BW (max-iops parameter divided by the max-bw parameter) that is allowed to process over a short period of time.	Select at least one of the following: - burst-percentage - io-size - limit-type - max-bw - max-iops - qos-policy-name
io-size	The QoS Policy IO-size in bytes. This parameter is used only when the maximum limit is specified in IOPS units. The values are 512b, 1kb, 2kb, 4kb, 8kb, 6kb, 32kb, 64kb, 128kb, 256kb, 512kb and 1mb.	

Quality of Service (QoS) Policies

Input Parameter	Description	Mandatory
limit-type	Indicates the type of limit applied to objects assigned this QoS Policy. Values: - fixed – the QoS Policy's specified limits are applied to the associated objects (the specified limits are the effective limits). - adaptive – the QoS Policy's specified limits are per provisioned GB and calculated according to the associated object's size (the calculated limits are the effective limits). Note: adaptive limit-types apply to Volumes and Consistency Groups, only.	But not both: - max-bw - max-iops
max-bw	The QoS Policy's maximum bandwidth [KB/s]. This is the maximum sustained bandwidth that will be allowed to process over an extended period of time. The value is must be suffixed by one of the following: - k – indicates KBps, for example "1024k" - m – indicates MBps, for example "100M" Note: adaptive limit-types apply to Volumes and Consistency Groups, only. Note: You can specify max-bw or max-iops, but not both.	
max-iops	The QoS Policy's maximum number of IOPS. Note: You can specify max-bw or max-iops, but not both.	
qos-policy-name	The name of the new QoS Policy to create.	

Example Request

```
PUT /api/json/v3/types/qos-policies/0b54fee7546948ab81fe40de6bbe0013 HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"max-bw": "256k", "burst-percentage": 20}
```

Response

Note: The successful completion of this command returns no response.

Quality of Service (QoS) Policies

Removing a Quality of Service (QoS) Policy

DELETE /api/json/v3/types/qos-policies/<parameter (qos-policy-guid or qos-policy-index or ?name=qos-policy-name)>

This command (DELETE /api/json/v3/types/qos-policies/<parameter (qos-policy-guid or qos-policy-index or ?name=qos-policy-name)>) enables you to delete a Quality of Service (QoS) Policy.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
qos-policy-guid	A unique identifier for the QoS Policy.	Select one of the following: - qos-policy-guid - qos-policy-index - qos-policy-name
qos-policy-index	The index of the QoS Policy.	
qos-policy-name	The name of the QoS Policy.	

Example Request

DELETE /api/json/v3/types/qos-policies/0b54fee7546948ab81fe40de6bbe0013
HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

Note: The successful completion of this command returns no response.

Remote Protection Domains

Viewing the List of Remote Protection Domains

GET /api/json/v3/types/protection-domains

This command (GET /api/json/v3/types/protection-domains) displays information about the Remote Protection Domains.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
cluster-name	The cluster's name.	No

Example request

```
GET /api/json/v3/types/protection-domains?cluster-name=xbrickdrm1648 HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/protection-domains/",
      "rel": "self"
    }
  ],
  "protection-domains": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/protection-domains/1f762496b6ff4419945324a4c2d18377",
      "name": "rm",
      "sys-name": null
    }
  ]
}
```

Viewing the Details of a Remote Protection Domain

GET /api/json/v3/types/protection-domains/<parameter (protection-domain-guid or protection-domain-index or ?name=protection-domain-

Remote Protection Domains

name)>

This command (GET /api/json/v3/types/protection-domains/<parameter [protection-domain-guid or protection-domain-index or ?name=protection-domain-name]>) displays information about a specific Remote Protection Domain.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
protection-domain-guid	A unique identifier for the Protection Domain.	Select one of the following: - protection-domain-guid - protection-domain-index - protection-domain-name
protection-domain-index	The index of the Protection Domain.	
protection-domain-name	The name of the Protection Domain.	

Output Parameter	Description
obj-severity	The object severity based on severity level of current Alerts Alerts still uncleared) for this Protection-Domain. Values: - clear - No Alerts exist for this entity. - information - The highest severity for this entity and all contained objects is information. - minor - The highest severity for this entity and all contained objects is minor. - major - The highest severity for this entity and all contained objects is major. - critical - The highest severity for this entity and all contained objects is critical.
sys-index	The physical index of the system to which the object belongs.
index	The index of this Protection-Domain.
name	The name of this Protection-Domain.
num-links	The number of links that exist within the Protection-Domain.
num-of-cluster	The number of clusters in the Protection-Domain.

Remote Protection Domains

Output Parameter	Description
num-of-xms	The number of XMSs in the Protection-Domain.
num-replication-sessions	The number of Remote-Protection-Sessions in the Protection-Domain. This is calculated by the XMS.
obj-severity	The Protection-Domain severity, based on severity level of current Alerts (Alerts still uncleared) for this remote protection session Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical..
ip-addr	For each port in the port list, the IP Address of this target port.
port-id	For each port in the port list, the target port Id that is defined as <code>eth_replication</code> .
sys-id	For each port in the port list, the cluster to which the port belongs as a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
xenv-guid	For each port in the port list, the XENV guid of this port.
sys-connectivity-state	Indicates the connectivity status between the XMS and the specified cluster to which this Protection-Domain belongs. Values: • <code>connected</code> • <code>disconnected_no_replication</code> • <code>disconnected</code> • <code>unknown</code>

Remote Protection Domains

Output Parameter	Description
system-active-status	Indicates whether the cluster is working and in use for replication. Values: - active - active_no_replication - active_unsupported_sw_version - not_active - not_active_no_replication
xms-clocks-skew-status	Indicates the status of the skew of the XMS clocks. If the XMS clocks are significantly different, then there will be confusion regarding pit times and counters. Values: - healthy - exceeded
failure-reason	For each XMS in the XMS list, if a failure occurred, this is the reason the XMS is not connected with the local XMS. Values: - none - no_communication - authentication_failure - xms_busy - invalid_version
xms-list[].xms-connectivity-state	For each XMS in the XMS list, this is the connectivity state from the local XMS to the XMS in the XMS list. This property in the XMS is not updated. Values: - connected - disconnected - disconnected_no_replication - unknown
xms-list[].xms-domain-membership-name	For each XMS in the XMS list, the XMS membership name in the Protected-Domain.
xms-list[].xms-id	For each XMS in the XMS list, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.
xms-list[].xms-ip-address	For each XMS in the XMS list, the IP address of the XMS.

Example request

```
GET /api/json/v3/types/protection-domains/09fe34b6b41047ab994de5e906afee2c
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "index": 1,
    "sys-connectivity-state": null,
    "xms-clocks-skew-status": null,
    "name": "rm",
    "sys-index": "",
    "obj-severity": "information",
    "ip-link-list": [
      [
        "a0e2a50015834400865345722f886bbd",
        "xbrickdrm1652-xbrickdrm1648_2",
        1
      ],
      [
        "4bbe0933e3c94dc1b5a49491c396e343",
        "xbrickdrm1652-xbrickdrm1648_1",
        2
      ]
    ],
    "num-links": null,
    "system-active-status": null,
    "sys-name": "",
    "guid": "09fe34b6b41047ab994de5e906afee2c",
    "domain-size-status": null,
    "sys-id": [],
    "num-remote-replication-sessions": 2
  },
  "links": [
    {
      "guid": "09fe34b6b41047ab994de5e906afee2c",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/protection-domains/09fe34b6b41047ab994de5e906afee2c",
      "rel": "self"
    }
  ]
}
```

Adding a Peer XMS to a Remote Protection Domains**PUT /api/json/v3/commands/xms/add-peer**

This command (PUT /api/json/v3/commands/xms/add-peer) adds a peer XMS to a Remote Protection Domain.

For this command, input parameters (as described in the following table), should

Remote Protection Domains

be entered in the body.

Input Parameter	Description	Mandatory
remote-ip-addr	The IP address is used to identify the XMS to add.	Yes
remote-xms-user	The user name of a user on the XMS with the role admin. The user (client) is required to use this when adding an XMS to the local Protection Domain.	Yes
remote-user-password	The password for the remote-xms-user-name user.	Yes
remote-xms-alias-name	The remote XMS alias to be used in the Replication Domain.	Yes
local-xms-alias-name	The local XMS alias to be used in the Replication Domain.	No

Example Request

```
PUT /api/json/v3/commands/xms/add-peer HTTP/1.1
```

```
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
```

```
Authorization: Basic *****
```

```
Cache-Control: no-cache
```

```
{"remote-ip-addr":"10.102.68.193", "remote-xms-alias-name":"vxms-xbrickdrm1652.xiodrm.lab.emc.com", "remote-xms-user":"admin", "remote-user-password":"xxxxx"}
```

Response

Note: The successful completion of this command returns no response.

Modifying a Peer XMS in a Remote Protection Domain

PUT /api/json/v3/commands/xms/modify-peer/<parameter (protection-domain-guid or protection-domain-index or ?name=protection-domain-name)>

This command (PUT /api/json/v3/commands/xms/modify-peer/<parameter [protection-domain-guid or protection-domain-index or ?name=protection-domain-name]>) to rename a peer XMS, refresh the password for the replication manager to XMS communication authorization, or modify the IP address used for a XMS.

Remote Protection Domains

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
protection-domain-guid	A unique identifier for the Protection Domain.	Select one of the following: • protection-domain-guid • protection-domain-index • protection-domain-name
protection-domain-index	The index of the Protection Domain.	
protection-domain-name	The name of the Protection Domain.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
xms-alias-name	The current XMS alias to be used in the Replication Domain.	Yes
new-ip-addr	The IP address is used to identify the XMS.	Select at least one of the following: • new-ip-addr • new-xms-alias-name
new-xms-alias-name	The new XMS alias to be used in the Replication Domain.	

Remote Protection Domains

Example request

```
PUT /api/json/v3/commands/xms/modify-peer HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"xms-alias-name": "vxms-xbrickdrm1648.xiodrm.lab.emc.com", "new-xms-alias-name": "vxms-xbrickdrm9999.xiodrm.lab.emc.com"}
```

Response

Note: The successful completion of this command returns no response.

Removing a Peer XMS from a Remote Protection Domain

PUT /api/json/v3/commands/xms/remove-peer

This command (PUT /api/json/v3/commands/xms/remove-peer) removes a peer XMS from a Remote Protection Domain Peer.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
xms-alias-name	The current XMS alias to be used in the Replication Domain.	Yes
force	Indicates whether to remove the local Peer XMS even if the remote peer XMS is unreachable. Values: - true – remove if the remove peer XMS is unreachable - false – do not remove if the peer XMS is unreachable The default value is false.	No

Example request

```
PUT /api/json/v3/commands/xms/remove-peer HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"xms-alias-name":"vxms-xbrickdrm919.xiodrm.lab.emc.com"}
```

Response

Note: The successful completion of this command returns no response.

Remote Protection Consistency Group

Viewing the List of Remote Protection Consistency Groups

GET /api/json/v3/types/r-consistency-groups?cluster-name=xxxxx

This command (GET /api/json/v3/types/r-consistency-groups?cluster-name=xxxxx) displays information about the Remote Protection Consistency Groups.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
cluster-name	The cluster's name.	Yes

Example request

```
GET /api/json/v3/types/r-consistency-groups?cluster-name=xbrickdrm1648
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "r-consistency-groups": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-consistency-groups/4d0711b690e743709fa69c96c0827511",
      "name": "DBC61"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-consistency-groups/e0e530f9d79b43789172d6d8e998d3dc",
      "name": "Marco_CG1"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-consistency-groups/a519feb7d1e54f23b676b3c2217fd54c",
      "name": "Marco_CG_Dev_1"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-consistency-groups/cc09e69eb8fa401da9cd22aac1b98fb2",
      "name": "BWTestCG"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-consistency-groups/",
      "rel": "self"
    }
  ]
}
```

Remote Protection Consistency Group

Viewing the Details of a Remote Protection Consistency Group

GET /api/json/v3/types/r-consistency-groups/<parameter [r-consistency-group-guid or r-consistency-group-index or ?name= r-consistency-group-name]>?cluster-name=xxxxx

This command (GET /api/json/v3/types/r-consistency-groups/<parameter [r-consistency-group or r-consistency-group-index or ?name= r-consistency-group-name]>?cluster-name=xxxxx) displays information about the selected Remote Protection Consistency Group identified by its GUID.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
r-consistency-guid	A unique identifier for the Remote Protection Consistency Group.	Select one of the following: • r-consistency-guid • r-consistency-index • r-consistency-name
r-consistency-index	The index of the Remote Protection Consistency Group.	
r-consistency-name	The name of the Remote Protection Consistency Group.	
cluster-name	The cluster's name.	Yes

Output Parameter	Description
creation-time	The Consistency Group creation timestamp (in UTC).
index	The index of the this Protection Consistency Group.
last-refresh-from-obj-id	The Id of the object used to refresh this Consistency Group, using any type of snap-and-reassign operation.
last-refresh-time	The time this Consistency Group was last refreshed.
last-refreshed-from-obj-name	The name of the object used to refresh this Consistency Group, using any type of snap-and-reassign operation.
linked-consistency-group	The Id of the "root" Consistency Group from which this Linked- Consistency Group was created.
linked-consistency-group-name	The name of the "root" Consistency Group from which this Linked Consistency Group was created.

Remote Protection Consistency Group

Output Parameter	Description
num-local-protections	The number of local-protection sessions assigned to this Consistency Group. This value is calculated by the XMS.
num-of-snap-sets	The number of Snapshot Sets that belong to this Consistency Group.

Example request

GET /api/json/v3/types/r-consistency-groups/4d0711b690e743709fa69c96c0827511?cluster-name=xbrickdrm1648 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "content": {
    "index": 1,
    "creation-time": 1517394107194,
    "num-of-snap-sets": 32,
    "name": "DBCg1",
    "last-refresh-from-obj-id": "3871add5d9cb4624a2a57bb3bf2e5511",
    "linked-consistency-group": "7c2d52656e656e2048616c6c616b2d7c",
    "last-refresh-time": "1517860039271",
    "tag-list": [],
    "last-refreshed-from-obj-name": "",
    "linked-consistency-group-name": null,
    "guid": "4d0711b690e743709fa69c96c0827511"
  },
  "links": [
    {
      "guid": "4d0711b690e743709fa69c96c0827511",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-consistency-groups/4d0711b690e743709fa69c96c0827511",
      "rel": "self"
    }
  ]
}
```

Remote Protection IP-Links

Viewing the List of Remote Protection IP Links

GET /api/json/v3/types/ip-links

This command (GET /api/json/v3/types/ip-links) displays the list of all Remote Protection IP-Links.

Example

```
GET /api/json/v3/types/ip-links HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/ip-links/",
      "rel": "self"
    }
  ],
  "ip-links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/ip-links/735bf5ad39b94ecf8b241feda9af4cb2",
      "name": "xbrickdrm1652-xbrickdrm1650_1",
      "sys-name": null
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/ip-links/144712819fd14e71af15083efc786e2c",
      "name": "xbrickdrm1650-xbrickdrm1652_5",
      "sys-name": null
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/ip-links/65ed5b3762064dc7a9bdd40aa17d1bc7",
      "name": "xbrickdrm1650-xbrickdrm1652_3",
      "sys-name": null
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/ip-links/916a9e048f7e4d409a55b14143ef323a",
      "name": "xbrickdrm1650-xbrickdrm1652_4",
      "sys-name": null
    }
  ]
}
```



```
} ]
```

Viewing the Details of an Remote Protection IP Link

GET /api/json/v3/types/ip-links/<parameter (ip-link-guid or ip-link-index or ?name=ip-link-name)>

This command (GET /api/json/v3/types/ip-links/<parameter [ip-link-guid or ip-link-index or ?name=ip-link-name]>) displays a specific Remote Protection IP-Link.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ip-link-guid	A unique identifier for the IP-Link.	Select one of the following: - ip-link-guid - ip-link-index - ip-link-name
ip-link-index	The index of the IP-Link.	
ip-link-name	The name of the IP-Link.	

Output Parameter	Description
a-end-ip-addr	The IP address in the IP-Link A-end cluster used for this IP link. The data type is IP which identifies the replication port on the IP-Link A-end cluster. The replication port's address is of data type IP/SN.
a-end-ip-addr-sn	The IP address subnet in the IP-Link A-end cluster used for this IP link
a-end-ip-link-id	An IP link between two clusters as represented in the IP-Link A-end cluster.
a-end-port-id	The target port object ID
a-end-sys-id	For the A-end of the IP-Link cluster Id (determined when the link was added and cannot be modified), a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.
a-end-xms-id	For the XMS on the IP-Link A-end cluster, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.
a-to-z-acc-received-data	The Accumulated data received (KB) in the A-end to Z-end IP-Link direction. This is stored in the monitoring database as category=bandwidth.

Remote Protection IP-Links

Output Parameter	Description
a-to-z-acc-requests-received	The total number of requests received over this link in the A-end to Z-end IP-Link direction. Available from the monitoring database of the relevant XMS, category=bandwidth.
a-to-z-acc-requests-sent	The number of requests sent over the link the A-end to Z-end IP-Link direction. Available from the monitoring database of the relevant XMS, category=bandwidth
a-to-z-acc-sent-data	The accumulated data sent (KB) in the A-end to Z-end IP-Link direction. This is stored in the monitoring database as category=bandwidth.
a-to-z-bw-received-data-rate	The data received rate (KB/s) in the A-end to Z-end IP-Link direction. This is stored in the monitoring database as category=bandwidth.
a-to-z-bw-requests-sent-rate	The send rate measured over 5 seconds over the link the A-end to Z-end IP-Link direction (KB/s). Available from the monitoring database of the relevant XMS, category=bandwidth.
a-to-z-bw-sent-data-rate	The data sent rate (KB/s) in the A-end to Z-end IP-Link direction. This is stored in the monitoring database as category=bandwidth.
a-to-z-ping-round-trip-time	The recent round-trip time for a ping over the link in the A-end to Z-end IP-Link direction according to XtremApp (microseconds). Available from the monitoring database of the relevant XMS, category=latency.
a-to-z-requests-processing-time	The processing time in the A-end to Z-end IP-Link direction (microseconds). Available from the monitoring database of the relevant XMS, category=bandwidth.
a-to-z-requests-received-rate	The requests received rate over this link in the A-end to Z-end IP-Link direction. Available from the monitoring database of the relevant XMS, category=bandwidth.
a-to-z-requests-round-trip-time	The recent round-trip time for a replication request over the A-end to Z-end IP-Link direction according to XtremApp (microseconds), including the remote cluster processing time. Available from the monitoring database of the relevant XMS, category=latency
certainty	IP-Link certainty. Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent but the XMS is unable to determine the success of the request. Values: - ok - There is certainty that the XMS is synchronized - add_pending - An add request was made by the XMS but uncertain if it was executed. - modify_pending - A modify request was made by the XMS but uncertain if it was executed. - remove_pending - A remove request was made by the XMS but uncertain if it was executed.

Remote Protection IP-Links

Output Parameter	Description
dropped-packets	The number of dropped packets on this IP-Link.
enabled-state	Indicates whether the port is currently enabled or has been disabled either by the user or by the system. If disabled by the user, then the user action is stronger than the system disabling and will hide the system disabling. Values: - enabled - user_disabled - system_disabled Default value for newly created link is enabled.
ip-link-consistency-state	The state of this IP link according to the local XMS. The state is based on property values in each IP Link retrieved from each cluster. The state of the combined IP Link is inconsistent in the following cases: - only one IP Link with the pairing label was discovered (i.e., no pair in one of the clusters) - two IP Links with the same pairing label were discovered, but there is a discrepancy in one or more persistent properties which determine the identity of an object as recorded in both clusters. - The passphrase_expected_rx values do not match the corresponding passphrase_transmit values on both IP Links. Values: - unknown - consistent - inconsistent - inconsistent_roles
ip-link-name	The ip-link-pairing-label-id Id name. This must be unique in the local XMS namespace.
ip-link-pairing-label-id	The object Id of this IP-Link within local XMS domain.
ip-link-state	The state of this IP-Link according to the local XMS. The state is based on the ip-link-state in each IP-Link retrieved from each cluster. The state of the combined IP-Link is inconsistent in the following cases only if the state of both IP-Links retrieved from the clusters are not identical. Otherwise, the cluster-level value is assigned. Values: - unknown - consistent - inconsistent - inconsistent_roles
link-rate	The negotiated link rate. This calculated by the local XMS as the minimum of the port speeds of both sides of the IP-Link from the Replication Target ports of the link endpoints.

Remote Protection IP-Links

Output Parameter	Description
obj-severity	The IP-Link's severity from the local XMS based on the severity of current current Alerts (Alerts still uncleared) in the IP-Link retrieved from each cluster. Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
protocol	The underlying communication protocol used over this IP-Link. Note: For the initial version, only TCP will be supported
z-end-ip-addr	The IP address in the IP-Link Z-end cluster used for this IP-Link.
z-end-ip-addr-sn	
z-end-ip-link-id	The Id of the IP-Link between two clusters as represented in the Z-end cluster.
z-end-port-id	The target port object ID.
z-end-sys-id	For the Z-end cluster this IP-Link is connecting, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index.
z-end-xms-id	For the XMS on the Z-end cluster this IP-Link is connecting, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.
z-to-a-acc-received-data	The data received (KB) in the Z-end of the IP-Link to A-end direction. This is stored in the monitoring database as category=bandwidth.
z-to-a-acc-requests-received	The total number of requests received over this link in the Z-end of the IP-Link to A-end direction. Available from the monitoring database of the relevant XMS, category=bandwidth.
z-to-a-acc-requests-sent	The number of requests sent over the link in the Z-end of the IP-Link to A-end direction. Available from the monitoring database of the relevant XMS, category=bandwidth
z-to-a-acc-sent-data	The data sent (KB). This is stored in the monitoring database as category=bandwidth.
z-to-a-bw-received-data-rate	The data received rate. This is stored in the monitoring database as category=bandwidth.

Remote Protection IP-Links

Output Parameter	Description
z-to-a-bw-requests-sent-rate	The send rate measured over 5 seconds over the link in the Z-end of the IP-Link to A-end direction (KB/s). Available from the monitoring database of the relevant XMS, category=bandwidth.
z-to-a-bw-sent-data-rate	The data sent rate (KB/s). This is stored in the monitoring database as category=bandwidth.
z-to-a-ping-round-trip-time	The recent round-trip time for a ping over the link in the Z-end of the IP-Link to A-end direction according to XtremApp (microsecond). Available from the monitoring database of the relevant XMS, category=latency
z-to-a-requests-processing-time	The processing time in the Z-end of the IP-Link to A-end direction. Available from the monitoring database of the relevant XMS, category=bandwidth.
z-to-a-requests-received-rate	The requests received rate over this link in the Z-end of the IP-Link to A-end direction. Available from the monitoring database of the relevant XMS, category=bandwidth.
z-to-a-requests-round-trip-time	The recent round-trip time for a replication request over the link in the Z-end of the IP-Link to A-end direction according to XtremApp (microseconds), including the remote cluster processing time. Available from the monitoring database of the relevant XMS, category=latency.

Remote Protection IP-Links

Example

```
GET /api/json/v3/types/ip-links/df8877baca8f439a9636b3849d830762 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "a-end-total-packets": "2031529",
    "protocol": "TCP",
    "z-end-ip-link-id": [
      "8f55f5baf1eb46738e9bf5e1fd440fbc",
      "rep-iplink1",
      1
    ],
    "a-end-acc-requests-sent": "0",
    "obj-severity": "information",
    "z-end-dropped-packets-ratio": null,
    "a-end-dropped-packets-ratio": null,
    "z-end-requests-round-trip-time": null,
    "z-end-requests-received-rate": null,
    "a-end-requests-received-rate": null,
    "ip-link-name": "rep-iplink1",
    "index": 1,
    "guid": "df8877baca8f439a9636b3849d830762",
    "a-end-dropped-packets": "7",
    "a-end-requests-round-trip-time": null,
    "z-end-xms-id": [
      "1e2a4778dfe04322933c8c807354edc7",
      "vxms-xbrickdrm1652.xiodrm.lab.emc.com",
      1
    ],
    "z-end-dropped-packets": "0",
    "z-end-acc-sent-data": null,
    "a-end-ip-addr-sn": "10.10.10.14/24",
    "a-end-bw-sent-data-rate": null,
    "z-end-ip-addr-sn": "10.10.10.10/24",
    "a-end-ip-link-id": [
      "78b26de9fd8149b7b4b7c64abc5870e2",
      "rep-iplink1",
      1
    ],
    "ip-link-consistency-state": "consistent",
    "a-end-requests-processing-time": null,
    "ip-link-pairing-label-id": null,
    "z-end-port-id": [
      "de129b311ea4451aa15fdbce7b5844b7",
      "X1-SC1-target1",
      1
    ],
    "z-end-acc-requests-received": "0",
    "z-end-sys-id": [
```

```

        "24aa0d7e826846eb84c62d16fb501eb7",
        "xbrickdrm1652",
        1
    ],
    "z-end-requests-processing-time": null,
    "a-end-acc-received-data": null,
    "z-end-ping-round-trip-time": null,
    "ip-link-state": "Up",
    "a-end-ip-addr": null,
    "a-end-acc-requests-received": "0",
    "z-end-bw-sent-data-rate": null,
    "z-end-acc-requests-sent": "0",
    "z-end-bw-received-data-rate": null,
    "a-end-acc-sent-data": null,
    "z-end-total-packets": "2030969",
    "z-end-acc-received-data": null,
    "a-end-xms-id": [
        "7bfb151459ab45f9a2e84b1bc83200b8",
        "vxms-xbrickdrm9999.xiodrm.lab.emc.com",
        0
    ],
    "link-rate": null,
    "z-end-bw-requests-sent-rate": null,
    "name": "rep-iplink1",
    "a-end-port-id": [
        "e52da8d941aa435f9ee3e8592beef67d",
        "X1-SC1-target1",
        1
    ],
    "a-end-sys-id": [
        "15ebc54ed7274cb78ecb6d083cc92061",
        "xbrickdrm1648",
        1
    ],
    "certainty": "ok",
    "enabled-state": "enabled",
    "a-end-ping-round-trip-time": null,
    "a-end-bw-received-data-rate": null,
    "z-end-ip-addr": null,
    "a-end-bw-requests-sent-rate": null
  },
  "links": [
    {
      "guid": "df8877baca8f439a9636b3849d830762",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/ip-links/df8877baca8f439a9636b3849d830762",
      "rel": "self"
    }
  ]
}

```

Remote Protection IP-Links

Adding an Remote Protection IP-Link

POST /api/json/v3/types/ip-links

This command (POST /api/json/v3/types/ip-links) adds a Remote Protection IP-Link.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
source-cluster-id	The Id of the source Cluster.	Yes
source-ip-addr-sn	The IP address of source interface.	Yes
target-cluster-id	The Id of the target Cluster.	Yes
target-ip-addr-sn	The IP address of the target interface.	Yes
ip-link-name	The ip-link-pairing-label-id Id name. This must be unique in the replication domain namespace	No
source-xms-name	The name of the source XMS.	No
target-xms-name	The name of the target XMS.	No

Output Parameter	Description
ip-link-ids	The Id of the IP-Link created.

Example

```
POST /api/json/v3/types/ip-links HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"source-cluster-id":"xbrickdrm1648","source-ip-addr-sn":"10.10.10.14/24",
"target-cluster-id":"xbrickdrm1652","target-ip-addr-sn":"10.10.10.10/24", "ip-
link-name":"rep-iplink1"}
```

Response

```
{
  "links": [
    {
      "guid": "22c63318a0804b32a3e306eb42c9ff0b",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/ip-
links/22c63318a0804b32a3e306eb42c9ff0b",
      "rel": "self"
    }
  ]
}
```

Modifying an Remote Protection IP Link

PUT /api/json/v3/types/ip-links/<parameter (ip-link-guid or ip-link-index or ?name=ip-link-name)>

This command (PUT /api/json/v3/types/ip-links/<parameter [ip-link-guid or ip-link-index or ?name=ip-link-name]>) modifies a Remote Protection IP-Link to enable/disable the IP-Link, rename the IP-Link, or refresh credentials

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ip-link-guid	A unique identifier for the IP-Link.	Select one of the following: - ip-link-guid - ip-link-index - ip-link-name
ip-link-index	The index of the IP-Link.	
ip-link-name	The name of the IP-Link.	

For this command, input parameters (as described in the following table), should be entered in the body.

Remote Protection IP-Links

Input Parameter	Description	Mandatory
enable	Indicates whether to enable the port. Values: - true - false Note: If enable is specified, disable cannot be specified.	Select one of the following: - enable - disable
disable	Indicates whether to disable the port. Values: - true - false Note: If disable is specified, enable cannot be specified.	
ip-link-name	A new name for the ip-link-pairing-label-id Id name. This must be unique in the local XMS namespace.	No
refresh-link-credentials	The user credentials to refresh the link.	No

Example

PUT /api/json/v3/types/ip-links/df8877baca8f439a9636b3849d830762 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"disable":"true"}

Response

Note: The successful completion of this command returns no response.

Removing a Remote Protection IP Link

DELETE /api/json/v3/types/ip-links/<parameter (ip-link-guid or ip-link-index or ?name=ip-link-name)>

This command (DELETE /api/json/v3/types/ip-links/<parameter [ip-link-guid or ip-link-index or ?name=ip-link-name]>) deletes a Remote Protection IP-Link.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ip-link-guid	A unique identifier for the IP-Link.	Select one of the following: - ip-link-guid - ip-link-index - ip-link-name
ip-link-index	The index of the IP-Link.	
ip-link-name	The name of the IP-Link.	

Example

```
DELETE /api/json/v3/types/ip-links/df8877baca8f439a9636b3849d830762 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Remote Protection Ports

Viewing the List of Remote Protection Ports

GET /api/json/v3/types/r-target-ports

This command (GET /api/json/v3/types/r-target-ports) displays the list of all Remote Protection Ports.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
cluster-id	The Source or target Cluster's name.	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example

```
GET /api/json/v3/types/r-target-ports?cluster-name=xbrickdrm1652 HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "r-target-ports": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-target-ports/07e07a2fedf444d7b5c16590be8d4334",
      "name": "X1-SC1-target1-rename",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-target-ports/3cb4069a435244d7838175e0f73bc327",
      "name": "X1-SC1-target2",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-target-ports/ece56e125cb54448a69bb2d534b98035",
      "name": "X1-SC2-target1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-target-ports/dc7df86dc8cd4117816d1aa3c80e78b6",
      "name": "X1-SC2-target2",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-target-ports/",
      "rel": "self"
    }
  ]
}
```

Remote Protection Ports

Viewing the Details of a Remote Protection Port

GET /api/json/v3/types/r-target-port/<parameter (r-target-port-guid or r-target-port-index or ?name= r-target-port-name)>&cluster-name=xxxxx

This command (GET /api/json/v3/types/r-target-ports/<parameter [r-target-port-guid or ?name= r-target-port-name]>&cluster-name=xxxxx) displays a specific Remote Protection Portal.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
r-target-port-guid	A unique identifier for the Remote Protection Portal.	Select one of the following: • r-target-port-guid • r-target-port-index • r-target-port-name
r-target-port-index	The index of the Remote Protection Portal.	
r-target-port-name	The name of the Remote Protection Portal.	
cluster-name	The name of the Cluster to which this object belongs.	Yes

Output Parameter	Description
guid	A unique identifier for the Remote Protection Portal.
index	The index of the Remote Protection Portal.
name	The name of the Remote Protection Portal.
num-of-links	The number of links for this Remote Protection Portal.
port-address	The IP address Remote Protection Portal.
port-id	The Id of this Remote Protection Portal.
port-speed.	The speed of the Remote Protection Portal. Values: • 10mb • 100mb • 1gb • 10gb • unknown

Remote Protection Ports

Output Parameter	Description
port-state	State of the Remote Protection Portal. Values: - up - Port is physically connected. - down - Port is physically disconnected. - unknown - Port state cannot be determined. This is also
sys-id	The cluster to which the Remote Protection Portal belongs as a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
xenv-guid	The XENV guid of this Remote Protection Portal.
xms-id	For the XMS, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Remote Protection Ports

Example

```
GET /api/json/v3/types/r-target-
ports/e52da8d941aa435f9ee3e8592beef67d?cluster-name=xbrickdrm1648 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "index": 1,
    "port-address": "iqn.2008-05.com.xtremio:xio00170303609-
514f0c5070cf6401",
    "xms-id": [
      "7bfb151459ab45f9a2e84b1bc83200b8",
      "xms",
      1
    ],
    "name": "X1-SC1-target1",
    "num-of-links": 1,
    "port-state": "up",
    "sys-id": [
      "15ebc54ed7274cb78ecb6d083cc92061",
      "xbrickdrm1648",
      1
    ],
    "sys-index": 1,
    "port-id": null,
    "xenv-guid": "9845bc3f011842888d069c9435dc7e50",
    "sys-name": "xbrickdrm1648",
    "guid": "e52da8d941aa435f9ee3e8592beef67d",
    "port-speed": "10Gb",
    "max-port-speed": null
  },
  "links": [
    {
      "guid": "e52da8d941aa435f9ee3e8592beef67d",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-target-
ports/e52da8d941aa435f9ee3e8592beef67d",
      "rel": "self"
    }
  ]
}
```


Remote Protection Sessions

Viewing the List of Remote Protection Sessions

GET /api/json/v3/types/remote-protections

This command (GET /api/json/v3/types/remote-protections) displays information about the Remote Protection Sessions.

Example request

```
GET /api/json/v3/types/remote-protections HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/remote-
protections/",
      "rel": "self"
    }
  ],
  "remote-protections": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/remote-
protections/037ea5c6896c4a1282b4f41ddf338efe",
      "name": "Alex1 remote protection"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/remote-
protections/02925b8398ec4532bb5eb0161788285c",
      "name": "DBCG1-NY-NJ"
    }
  ]
}
```

Remote Protection Sessions

Viewing the Details of a Remote Protection Session

GET /api/json/v3/types/remote-protections/<parameter (remote-protection-guid or remote-protection-index or ?name= remote-protection-name)>

This command (GET /api/json/v3/types/remote-protections/<parameter [remote-protection-guid or remote-protection-index or ?name=remote-protection-name]>) displays information about the selected Remote Protection Session.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
remote-protection-guid	A unique identifier for the Remote Protection Session.	Select one of the following: - remote-protection-guid - remote-protection-index - remote-protection-name
remote-protection-index	The index of the Remote Protection Session.	
remote-protection-name	The name of the Remote Protection Session.	
prop-list	Defines the command output	No

Output Parameter	Description
activation-time	The time this replication session was activated. It is set when the remote protection session is activated.
actual-protection-window-copies	The actual total number of PIT retained on the replication session.
actual-protection-window-duration-in-days	The actual protection window in days for which the Snapshot Sets exist
block-access-type	Indicates the volume-access type mode for the replicated Volumes in this replication session. Values: - read_only - no_access

Remote Protection Sessions

Output Parameter	Description
current-command-name	The name of the last command applied. This is used for commands that use the current-command-status property. The value is set when the command is invoked and remains until a new command is invoked. It is reset to NULL when XMS restarts. Note: This maintained in local XMS only and applies to remote protection only.
current-command-status	Indicates the status of the last command applied to the remote protection session. This is used for monitoring long (asynchronous) commands. When starting a command the value should be set to in-progress. When the command completes the value should be set to succeeded or failed. This property is the status for the command that is named in the current-command-name. Values: • none –XMS restarted and no command has been executed • success – command successfully completed • failure – command failed to complete • in_progress – a command started and is in progress • failover_success – failover succeeded • failover_failure – failover failed • switchover_success – switchover succeeded • switchover_in_progress – switchover in progress Note: This maintained in XMS only and applies remote protection only.
cycle-duration-sec	The duration of the current cycle in seconds. This value is stored in the monitoring database.
cycle-number	The current replication cycle of this replication session. This value is stored in the monitoring database.
cycle-percent-remaining	The percent of the cycle that remains to be transferred. This value is not stored in the monitoring database.
cycle-start-time	The current replication cycle's start time, if current cycle is active. NULL if the current cycle is not active. This value is stored in the monitoring database.
cycle-time-remaining-sec	An estimation of how many seconds remain for the current replication to complete as calculated by SYM. If replication is active, the value is a minimum of 1 second. If no replication is active, the value is 0. This value is not stored in the monitoring database.

Remote Protection Sessions

Output Parameter	Description
defined-protection-window-num-copies	The total number Snapshot Set copies retained. For remote protection this is for the target side. The value is 0 if there is no retention policy assigned or if the target retention policy enabled state is disabled.
initial-source-sys-guid	Identifies which of the clusters was initially the source when the replication session was defined. This is used to determine the replication direction after failover.
initial-target-sys-guid	Identifies which of the clusters was initially the target when the replication session was defined. This is used to determine the replication direction after failover.
replication-mode	Indicates the mode of replication. Values: • sync • async
name	The name of the Remote Protection Session.
next-scheduled-cycle	The time when the next cycle is estimated to start. SYM returns the higher of either the minimal cycle time or an estimate on when the finish the current cycle will finish.
num-missing-long-period-pits	The number of Snapshot Sets that are missing from the configured long period of the retention policy for this replication session.
num-missing-middle-period-pits	The number of Snapset Sets that are missing from the configured middle period of the retention policy for this replication session.
num-missing-short-period-pits	The number of snapsets that are missing from the configured short period of the retention policy for this replication session.
obj-severity	The Remote-Protection-Session's severity, based on severity level of current Alerts (Alerts still uncleared) for this remote protection session Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.

Remote Protection Sessions

Output Parameter	Description
protection-window-duration-in-days	The longest time a Snapshot Set is configured to be retained. For remote protection, this is for the target side. If no retention policy is assigned the value is 0.
remote-protection-session-consistency-state	The state of this remote protection session from XMS. The state is based on information retrieved from each replication session and each cluster. Values: - unknown – consistency cannot be determined - consistent – remote protection session is consistent - inconsistent - remote protection session is not consistent - inconsistent_roles - remote protection session is not consistent For local protection the value is always consistent.
remote-sys-guid	The identifying GUID of the remote cluster to which the remote CG belongs.
replication-direction	The direction in which the replication is operating. Values: - source_to_target - failover
replication-session-id	The Id of the replication session.
replication-state	The current state of this replication session. Values: - active – The replication session is active. - inactive – The replication session is not active. - suspended – The replication session is suspended - error – an error occurred during the replication session and the session is not active. - wait_for_resources – The replication is waiting for a resource. - suspend_pending – A replication suspend operation is pending.
replication-state-details	The details of the replication state. For example, if the replication state is wait-for-resources, the value indicates the resource and cluster, or if the replication state is error, the value indicates the reason for the error condition Note: This is a persistent value. If the local XMS is deactivated and then activated the value is not lost.

Remote Protection Sessions

Output Parameter	Description
rpo-sec	The desired RPO (maximal lag) in seconds. If the RPO is 0, then as soon as one cycle completes a new cycle is started. This is stored in the monitoring database as category=latency.
rpo-status	Indicates whether the RPO is met. Values: - according_to_plan – the RPO is being met. - rpo_exceeded – the RPI is not being met.
source-cg-id	For the Consistency Group defined as the current source, a tuple array containing the following parameters (in the following order): the Consistency Group object GUID identifier, the Consistency Group name, and the Consistency Group index.
source-failover-timestamp	The time when the current source side was configured with the source role.
source-num-snapshot-sets	The number of snapsets currently existing for the source cluster.
source-retention-policy-guid	The object Id for the retention policy object assigned to the currently defined source side.
source-sys-id	The source cluster as a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index.
source-xms-id	For the XMS managing the source cluster, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.
target-cg-id	For the Consistency Group defined as the current target, a tuple array containing the following parameters (in the following order): the Consistency Group object GUID identifier, the Consistency Group name, and the Consistency Group index.
target-failover-timestamp	The timestamp (in UTC) when the currently 'target' side was configured as the source role. Set by the local XMS.
target-num-snapshot-sets	The number of snapsets currently existing for the target cluster.
target-retention-policy-guid	The object Id for the retention policy object assigned to the the currently defined target side.

Remote Protection Sessions

Output Parameter	Description
target-retention-policy-id	For the retention policy on the target side, a tuple array containing the following parameters (in the following order): the retention policy object GUID identifier, the retention policy name, and the retention policy index. If NULL, a single complete Snapshot Set will still be maintained on the target side.
target-snapshot-set-num-copies-status	The number of PITS.
target-snapshot-set-window-size-status	The protection window size.
target-sys-id	The target cluster as a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index.
target-xms-id	For the XMS managing the target cluster, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.
verification-enabled-state	If enabled (default), then data verification is performed as part of the replication process.
verification-status	Indicates the verification status of the Snapshot Set being verified.
volume-pair-list	A list of all Volume-Pairs participating in replication, pairing Volumes from two consistency groups. Each is identified using volume-pair-id.

Example request

```
GET /api/json/v3/types/remote-protections/6b330d89141042f19f0fc9cc228cb487
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Remote Protection Sessions

Response

```
{
  "content": {
    "current-protection-window-copies": 2,
    "obj-severity": "information",
    "replication-session-consistency-state": "consistent",
    "replication-state-details": "",
    "target-missing-pits-alerts": "enabled",
    "guid": "e9537fdf2ce24a1a994410ff339a18e8",
    "replication-direction": "failover",
    "target-sys-id": [
      "44fe6e8c38ee4be29ef24026d0d474b8",
      "xbrickdrm1648",
      1
    ],
    "source-xms-id": [
      "45a8036d3c1b4f249cd12efd6df0f69b",
      "vxms-xbrickdrm1652.xiodrm.lab.emc.com",
      1
    ],
    "test-copy-backup-id": null,
    "replication-session-pairing-label-id": [
      "e9537fdf2ce24a1a994410ff339a18e8",
      "PS.TW.01",
      2
    ],
    "source-num-missing-short-period-pits": 0,
    "cycle-number": 182,
    "num-of-vols": 1,
    "target-retention-policy-enabled-state": "disabled",
    "actual-protection-window-duration-in-days": 0.0007726736000000001,
    "source-configured-retention-policy-id": [
      "7c2d52656e656e2048616c6c616b2d7c",
      "",
      0
    ],
    "target-pit-num-copies-status": null,
    "last-cycle-efficiency-ratio": 0,
    "cycle-start-time": "1518628525476",
    "replication-mode": "async",
    "protection-window-duration-in-days": 0,
    "current-command-name": "",
    "target-num-missing-middle-period-pits": 0,
    "name": "PS.TW.01",
    "target-retention-policy-id": [
      "7c2d52656e656e2048616c6c616b2d7c",
      "",
      0
    ],
    "cycle-duration-sec": "0",
    "rpo-status": "according_to_plan",
    "protection-window-num-copies": 0,
    "last-cycle-start-time": "1518628525476",
    "ss-backup-id": [],
    "current-command-status": "succeeded",
  }
}
```



```

"source-sys-id": [
  "a07f79e0989743e59a116500b3a4b80e",
  "xbrickdrm1652",
  1
],
"source-num-missing-long-period-pits": 0,
"source-retention-policy-enabled-state": "disabled",
"retention-policy-id": null,
"cycle-percent-remaining": 100,
"source-pit-window-size-status": null,
"next-scheduled-cycle": "1518683485042",
"num-source-pits": null,
"target-num-missing-short-period-pits": 0,
"target-cg-id": [
  "f4f34bda797e4064b4a9cb87132c2b80",
  "CG.TW.0001",
  5
],
"source-cg-id": [
  "42a849b077dc47a59353d43169121116",
  "CG.TW.0001",
  2
],
"activation-time": null,
"index": 2,
"source-retention-policy-id": [
  "7c2d52656e656e2048616c6c616b2d7c",
  "",
  0
],
"block-access-type": "read_only",
"target-num-missing-long-period-pits": 0,
"efficiency-ratio": 1,
"source-num-missing-middle-period-pits": 0,
"source-pit-num-copies-status": "ok",
"target-num-pits": 2,
"target-xms-id": [
  "36b0474eca4240cca658740c198d0faf",
  "vxms-xbrickdrm1648",
  0
],
"last-cycle-completed-pit": "00000000000000000000000000000000",
"cycle-time-remaining-sec": "0",
"cluster-pair-link-id": null,
"bw": null,
"source-num-pits": 2,
"oldest-completed-pit-cycle-time": null,
"lag": null,
"rpo-compliance-ratio": 0,
"replication-session-id": null,
"last-cycle-duration": null,
"certainty": "ok",
"rpo-sec": 10,
"num-target-pits": null,
"current-protection-window-duration-in-days": 0,
"target-pit-window-size-status": null,
"replication-state": "inactive",
"target-configured-retention-policy-id": [
  "7c2d52656e656e2048616c6c616b2d7c",

```

Remote Protection Sessions

```
    ""',
    0
  ],
  "links": [
    {
      "guid": "e9537fdf2ce24a1a994410ff339a18e8",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/remote-
protections/e9537fdf2ce24a1a994410ff339a18e8",
      "rel": "self"
    }
  ]
}
```

Adding a Remote Protection Session

POST /api/json/v3/types/remote-protections

This command (POST /api/json/v3/types/remote-protections) enables you to create a Remote Protection Session.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
protection-session-name	The name of the Replication Session Name.	Yes
rpo	The Recovery Point Objective (in seconds)	Yes
source-cluster-id	The source Cluster ID.	Yes
source-consistency-group-id	The source Consistency Group ID.	Yes
target-cluster-id	The target-Cluster ID.	Yes
auto-provision-target	Indicates whether the target's Consistency Groups should be automatically provisioned. Values: - true – automatically provision - false – do not automatically provision	Select either one of the following: - auto-provision-target - target-consistency-group-id
target-consistency-group-id	The source Consistency Group ID.	
protection-window-compliance-alert	Indicates whether Target Missing PITs Alerts are enabled or disables. Values: - enabled - disabled	No
replication-mode	The replication type. Values: - async (default) - sync	No
source-retention-policy-id	The Retention Policy Id on the source cluster.	No
source-xms-name	The name of the XMS on the source.	No
start-on-creation	Indicates whether to start the Remote Protection Session when it is created.	No

Remote Protection Sessions

Input Parameter	Description	Mandatory
target-retention-policy-id	The Retention Policy Id on the source cluster.	No
target-volume-access	Indicates the volume-access type mode for the target Volume in this remote protection session. Values: - read_only - no_access	No
target-xms-name	The name of the XMS on the target.	No

Example

POST api/json/v3/types/remote-protections HTTP/1.1

Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com

Authorization: Basic *****

Cache-Control: no-cache

```
{"source-consistency-group-id":"PRD-CG","auto-provision-target":"true","source-cluster-id":"xbrckdrm1648","target-cluster-id":"xbrickdrm1652","protection-session-name":"PRD-CG-Session","rpo":60}
```

Response

```
{
  "links": [
    {
      "guid": "c6e01f908d034cfc869088370f147eef",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/remote-protections/c6e01f908d034cfc869088370f147eef",
      "rel": "self"
    }
  ]
}
```

Modifying a Remote Protection Session

PUT /api/json/v3/types/remote-protections/<parameter (remote-protection-guid or remote-protection-index or ?name= remote-protection-name)>

This command (PUT /api/json/v3/types/remote-protections/<parameter [remote-protection-guid or remote-protection-index or ?name= remote-protection-name]>) enables you to modify a Remote Protection Session, including add local and remote retention policies to a Remote Protection Session, rename the Remote Protection Session, enable and disable target missing PIT alerts, release a Remote Protection Session lock, and modify the RPO.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
remote-protection-guid	A unique identifier for the Remote Protection Session.	Select one of the following: - remote-protection-guid - remote-protection-index - remote-protection-name
remote-protection-index	The index of the Remote Protection Session.	
remote-protection-name	The name of the Remote Protection Session.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
protection-session-name	The name of the Replication Session Name.	Yes
new-protection-session-name	The new name of the Replication Session Name.	Select one of the following: - new-protection-session-name - protection-window-
protection-window-compliance-alert	Indicates whether Target Missing PIT Alerts are enabled or disables. Values: - enabled - disabled	

Remote Protection Sessions

Input Parameter	Description	Mandatory
release-lock	Indicates whether to release a Replication Session lock. Values: - true –release the lock - false – do not release the lock	compliance-alert • release-lock • remove-target-retention-policy OR target-retention-policy-id • rpo • remove-source-retention-policy OR source-retention-policy-id
remove-source-retention-policy	Indicates whether to remove the source retention policy. Values: - true –remove the source retention policy - false – do not remove the source retention policy	
remove-target-retention-policy	Indicates whether to remove the target retention policy. Values: - true –remove the target retention policy - false – do not remove the target retention policy	
rpo	The Recovery Point Objective (in seconds)	
source-retention-policy-id	The Retention Policy Id on the source cluster.	
target-retention-policy-id	The Retention Policy Id on the source cluster.	No
force	Indicates whether to modify the local Peer XMS even if the remote peer XMS is unreachable. Values: - true – modify if the remove peer XMS is unreachable - false – do not modify if the peer XMS is unreachable The default value is false.	

Example

```
POST /api/json/v3/types/remote-protections/722180b157b9417fb296bcbbae746484
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{" protection-session-id ":"PRD-CG-Session","source-retention-policy-id":"Tier1","target-retention-policy-id":"Local-Hourly","protection-window-compliance-alert":"enabled"}
```

Response

Note: The successful completion of this command returns no response.

Remote Protection Sessions

Managing Remote Protection Sessions

PUT /api/json/v3/commands/remote-protections/<operation>/<parameter (remote-protection-guid or remote-protection-index or ?name=remote-protection-name)>

This command (PUT /api/json/v3/commands/remote-protections/<operation>/<parameter [remote-protection-guid or remote-protection-index or ?name=remote-protection-name]>) enables you to manage a Remote Protection Session.

The following table describes the Remote Protection Session management operations.

Operations	Description
start	Starts a Remote Protection Session
suspend	Suspends the current Remote Protection Session
resume	Resumes a previously suspended a Remote Protection Session
replicate-now	Returns the cycle number of the current Remote Protection Session for "bookmarking" Snapshot Sets
remove-snapshot-sets	Removes either the Snapshot Sets in a specific date and time range, or a specific Snapshot Set Note: The remove-snapshot-sets operation must be run twice to remove Snapshots from both source and target sides.
failover	Performs a planned or unplanned failover between a source and a target.
failover-cleanup	Performs a cleanup after a failover operation
test-copy-start	Starts a failover test
test-copy-finish	After a failover test, resets the Consistency Groups to no access/read only permissions.
terminate	Terminates a Remote Protection Session and removes interim Snapset Sets that have not completed replication

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
remote-protection-guid	A unique identifier for the Remote Protection Session.	Select one of the following:

Remote Protection Sessions

Input Parameter	Description	Mandatory
remote-protection-index	The index of the Remote Protection Session.	- remote-protection-guid - remote-protection-index - remote-protection-name
remote-protection-name	The name of the Remote Protection Session.	
operation	The type of Remote Protection Session management operation to execute: failover - performs a failover between the source and target sides. Note: This operation is used for planned or unplanned failovers in combination with either the snapshot-set-selection or snapshot-set-id values to determine which Snapshot Set to use for failover. failover-cleanup - performs a cleanup after a planned or unplanned failover, according to the user's input for the source and target roles. remove-snapshot-sets - removes a specific or a range of Snapshot Sets. replicate-now - retrieves the current cycle number for "bookmarking" a cycle. resume - resumes the specified, previously suspended, remote-protection session. start - starts the specified remote-protection session suspend - suspends the specified remote-protection session using the suspend-type value to determine whether the current replication cycle is interrupted or completed terminate - terminates the specified remote-protection session immediately and removes interim Snapshot Sets that have not been replicated. Note: This operation should be followed by start operation. test-copy-finish - resets the Consistency Group Volumes to no-access/read-only, after test-copy was completed. test-copy-start - starts a test copy. XMS sets the no-backup flag internally to true.	Yes

Remote Protection Sessions

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
bookmark-name	For the replicate-now operation only, the name (bookmark) assigned to the Snapshot Set.	No
force	For the terminate operation only, allows a session to terminate even if the peer XMS is unreachable.	No
retention-time	For the replicate-now operation only, the time to keep the Snapshot Set. If the retention-time is not specified with a replicate-now operation, the Snapshot Set will be kept indefinitely until explicitly deleted).	No
snapshot-set-id	For the failover and test-copy-start operations only, use to specify a specific Snapshot Set.	Select one of the following: • snapshot-set-id • snapshot-set-selection
snapshot-set-selection	For the failover and test-copy-start operations only, either use one of the following values to select as Snapshot Set or the snapshot-set-id value to specify a Snapshot Set. Values: • using-latest-snapshot-set - use the latest consistent Snapshot Set available • use-test-copy-snapshot-set - use a Snapshot Set currently marked as being used for test-copy • sync-and-failover - failover becomes switchover, a sync now is initiated, and then the failover process is performed. This value must be used to failover without data loss.	
snapshot-sets-to-remove-side	For the remove-snapshot-sets operation only, indicates the side from which to remove the Snapshot Set. Values: • source – remove the Snapshot Set from the source side • target – remove the Snapshot Set from the target side Note: The remove-snapshot-sets operation must be run twice to remove Snapshots from both source and target sides.	No

Remote Protection Sessions

Input Parameter	Description	Mandatory
snapshot-sets-to-remove-since	For the remove-snapshot-sets operation only, the date and time of the earliest Snapshot Set to remove. Snapshot Sets before this date and time will not be removed. The date and time format is "YYYY-MM-DD HH:MM:SS", for example "2018-03-05 15:30:00". The default value is 0, indicating since the beginning of time.	No
snapshot-sets-to-remove-until	For the remove-snapshot-sets operation only, the date and time of the latest Snapshot Set to remove. Snapshot Sets after this date and time will not be removed. The date and time format is "YYYY-MM-DD HH:MM:SS", for example "2018-03-05 15:30:00". The default value is 0, indicating immediately before the newest Snapshot Set.	No
source-xms-id	For the failover-cleanup operation only, use to indicate the XMS name that will be set as replication source.	No
start-replication-with-failover	For the failover and failover-cleanup operations only, indicates whether the replication state will be active after the replication completes. Values: - true – the replication will be activated. - false – the replication will be inactive.	No
suspend-type	For the suspend operation only, indicates the type of suspend operation to perform for handling the current replication cycle. Values: - immediate – if necessary, interrupt the current replication cycle and the suspend the replication session. - graceful – complete the current cycle and then suspend the replication session.	No
sys-id	For the remove-snapshot-sets operation only, use to indicate cluster from which Snapshot Sets will be removed.	No
xms-name	The name of the XMS.	No

Example - Start

```
PUT /api/json/v3/commands/remote-
protections/start/c2ade4c4b38748978c392191e60b5288 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Remote Protection Sessions

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Example - Suspend

```
PUT /api/json/v3/commands/remote-
protections/suspend/c2ade4c4b38748978c392191e60b5288 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Example - Resume

```
PUT /api/json/v3/commands/remote-
protections/resume/c2ade4c4b38748978c392191e60b5288 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Example - Replicate-Now

```
PUT /api/json/v3/commands/remote-protections/replicate-
now/c2ade4c4b38748978c392191e60b5288 HTTP/1.1
```

```
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Remote Protection Sessions

Example - Failover

```
PUT /api/json/v3/commands/remote-protections/
failover/b0a9c7f9d6254dabb56905ebd7f3fd59 HTTP/1.1
```

```
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"snapshot-set-id" : ["cba6892e8e2a4cecbfce492216a4048f"]}
```

Response

Note: The successful completion of this command returns no response.

Example - Failover-Cleanup

```
PUT /api/json/v3/commands/remote-protections/failover-
cleanup/e9537fdf2ce24a1a994410ff339a18e8 HTTP/1.1
```

```
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use `"-d {}"` or `"-data {}"`.

Response

Note: The successful completion of this command returns no response.

Example - Test-Copy-Start

```
PUT /api/json/v3/commands/remote-protections/test-copy-
start/b0a9c7f9d6254dabb56905ebd7f3fd59 HTTP/1.1
```

```
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"snapshot-set-id" : ["cba6892e8e2a4cecbfce492216a4048f"]}
```

Response

Note: The successful completion of this command returns no response.

Example - Test-Copy-Finish

```
PUT /api/json/v3/commands/remote-protections/test-copy-
finish/e9537fdf2ce24a1a994410ff339a18e8 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response JSON.

Example - Remove-Snapshot-Sets (Source)

```
PUT /api/json/v3/commands/remote-protections/remove-snapshot-
sets/c2ade4c4b38748978c392191e60b5288 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"snapshot-sets-to-remove-side":"source","snapshot-sets-to-remove-
since":"2018-03-05 15:30:00","snapshot-sets-to-remove-until":"2018-03-05
15:45:00"}}
```

Response

Note: The successful completion of this command returns no response.

Example - Remove-Snapshot-Sets (Target)

```
PUT /api/json/v3/commands/remote-protections/remove-snapshot-
sets/c2ade4c4b38748978c392191e60b5288 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"snapshot-sets-to-remove-side":"target","snapshot-sets-to-remove-
since":"2018-03-05 15:30:00","snapshot-sets-to-remove-until":"2018-03-05
15:45:00"}}
```

Response

Note: The successful completion of this command returns no response.

Remote Protection Sessions

Example - Terminate

```
PUT /api/json/v3/commands/remote-
protections/terminate/c2ade4c4b38748978c392191e60b5288 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Removing a Remote Protection Session

DELETE /api/json/v3/types/remote-protections/<parameter (remote-protection-guid or remote-protection-index or ?name= remote-protection-name)>

This command (DELETE /api/json/v3/types/remote-protections/<parameter [remote-protection-guid or remote-protection-index or ?name= remote-protection-name]>) enables you to delete a Remote Protection Session.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
remote-protection-guid	A unique identifier for the Remote Protection Session.	Select one of the following: - remote-protection-guid - remote-protection-index - remote-protection-name
remote-protection-index	The index of the Remote Protection Session.	
remote-protection-name	The name of the Remote Protection Session.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
remove-target-volumes	Indicates whether to remove the Volumes on the target. Values: - true – remove the Volumes on the target. - false – do not remove the Volumes on the target. The default value is false.	No
force	Indicates whether to terminate the Remote Protection Session even if the peer XMS is unreachable. Values: - true – terminate if the peer XMS is unreachable - false – do not terminate if the peer XMS is unreachable The default value is false.	No

Example – Remote Protection Session

```
DELETE /api/json/v3/types/remote-protections/c6e01f908d034cfc869088370f147eef
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Remote Protection Sessions

Example – Remote Protection Session Including Remote Protection Volumes

```
DELETE /api/json/v3/types/remote-protections/c6e01f908d034cfc869088370f147eef
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
{"remove-target-volumes":"true"}
```

Response

Note: The successful completion of this command returns no response.

Remote Protection Volumes

Viewing the List of Remote Protection Volumes

GET /api/json/v3/types/r-volumes?cluster-name=xxxxx

This command (GET /api/json/v3/types/r-volumes?cluster-name=xxxxx) displays the list of all Remote Protection Volumes.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
cluster-name	The source or target cluster's name depending upon which Volumes are required. NOTE: The source and target clusters are the clusters used for the source-cluster-id and target-cluster-id parameters when the Remote Protection Session is created, see Adding a Remote Protection Session on page 403403.	Yes

Example

```
GET /api/json/v3/types/r-volumes?cluster-name=xbrickdrm1652 HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Remote Protection Volumes

Response

```
{
  "r-volumes": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-volumes/1a473f094bec4c81924c540660f3f4aa",
      "name": "09f7577ae3324938b028481a2dd26956.1525704606010",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-volumes/61acdf3b79e546ba89d2413cf42e01d1",
      "name": "b275dd5622924f80a3259d845f446111.1525704606010",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-volumes/016e921501ed481f9273d032d77fd461",
      "name": "357b56ab22164fcb94775de0e4037235.1525704606010",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-volumes/a91895199bd34f90a9c1b30cd2b5fb59",
      "name": "DB01",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-volumes/24be10d34be3486da15046ec8fc3de8a",
      "name": "DB03",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-volumes/11925fc72f9541fbb6355a43f2d48683",
      "name": "DB02",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/r-volumes/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of a Remote Protection Volume

GET /api/json/v3/types/r-volumes/<parameter (r-volume-guid or r-volume-index or ?name=r-volume-name)>?cluster-name=xxxxx

This command (GET /api/json/v3/types/r-volumes/<parameter [r-volume-guid or r-volume-index or ?name=r-volume-name]>?cluster-name=xxxxx) displays a specific Remote Protection Volume.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
r-volume-guid	A unique identifier for the Remote Protection Volume.	Select one of the following: • r-volume-guid • r-volume-index • r-volume-name
r-volume-index	The index of the Remote Protection Volume	
r-volume-name	The name of the Remote Protection Volume	
cluster-name	Cluster's name	Yes

Output Parameter	Description
alignment-offset	The alignment offset range is between 0-15
certainty	Indicates confidence that the XMS and the cluster are synchronized. The value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
created-by-app	Denotes the application which created the object.
created-from-volume	This parameter contains the Volume name, as it was at the Remote Protection Volume's creation time. The string remains unchanged when the ancestor is renamed, deleted or reassigned.
creation-time	Remote Protection Volume's creation timestamp (UTC)
guid	A unique identifier for the Remote Protection Volume.
index	The index of the Remote Protection Volume
last-refresh-from-obj-id	The name of the Remote Protection Volume
last-refresh-time	The time this Remote Protection Volume was last refreshed (for X2 clusters only)
lb-size	The "sector size" (LB size) of the Remote Protection Volume
logical-space-in-use	The total space used by the Remote Protection Volume

Remote Protection Volumes

Output Parameter	Description
management-locked	This indicates whether the Remote Protection Volume cannot be deleted and its data modified through refresh-and-restore operations. (for X2 clusters only).
naa-name	Remote Protection Volume's WWN/NAA name, globally unique and unique over time, set by the XMS (or by cluster) once a LUN is mapped to the Volume for the first time
name	Remote Protection Volume's name
num-of-lun-mappings	Number of LUN mappings defined for this Remote Protection Volume
related-consistency-groups	The Remote Protection Volume's related Consistency Group(s) ID(s), when relevant
small-io-alerts	When Remote Protection Volume parameters of small-io-alerts is set to disabled (default), no Alerts are sent for a high number of small I/Os.
snapgrp-index	The Snapgroup index.
snapshot-type	Defines the Snapshot type. Values: • readonly • regular
sys-id	For the cluster to which this Remote Protection Volume belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
tag-list	List of Tags
unaligned-io-alerts	When this Remote Protection Volume parameter is set to disabled (default), no Alerts are sent for a high number of unaligned I/Os.
vaai-tp-alerts	The VAAI Soft Limit warning for this Volume is reported when monitoring is enabled. The threshold is a cluster-wide value as configured in the cluster <code>vaai_tp_limit</code> . The default is disabled.
vol-access	Denotes the type of Remote Protection Volume and its accesibility.
vol-size	Total provisioned capacity. Volume KB size as exposed to Initiators

Example

```
/api/json/v3/types/r-volumes/44ffbe8804954346b0e5b639aa695516?cluster-
name=xbrickdrm1648 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "small-io-alerts": "disabled",
    "creation-time": "2018-02-13 12:30:21",
    "snapgrp-index": 7,
    "unaligned-io-alerts": "disabled",
    "last-refresh-time": "1518517821766",
    "tag-list": [],
    "vol-size": "8192",
    "num-of-lun-mappings": 0,
    "alignment-offset": 0,
    "guid": "44ffbe8804954346b0e5b639aa695516",
    "snapshot-type": "regular",
    "sys-id": [
      "44fe6e8c38ee4be29ef24026d0d474b8",
      "xbrickdrm1648",
      1
    ],
    "logical-space-in-use": "0",
    "vaai-tp-alerts": "disabled",
    "index": 22,
    "lb-size": 512,
    "naa-name": "",
    "name": "TWV.01",
    "certainty": "ok",
    "last-refresh-from-obj-id": null,
    "management-locked": true,
    "vol-access": "read_access",
    "created-from-volume": ""
  },
  "links": [
    {
      "guid": "44ffbe8804954346b0e5b639aa695516",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-
volumes/44ffbe8804954346b0e5b639aa695516",
      "rel": "self"
    }
  ]
}
```

Remote Snapshot Sets

Remote Snapshot Sets

Viewing the List of Remote Snapshot Sets

GET /api/json/v3/types/r-snapshot-sets?protection-session-id =xxxxx

This command (GET /api/json/v3/types/r-snapshot-sets?protection-session-id =xxxxx) displays the list of all Remote Snapshot Sets and their defined parameters.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
protection-session-id	The Id of the Replication Session Name in which the Remote Snapshot Sets reside.	Yes
from-time	The date and time of the oldest Snapshot Set to view.	No
to-time	The date and time of the newest Snapshot Set to view.	No
role	Indicates the current the Remote Snapshot Sets side to include in the view. Values: - source - target - both	Select either one of the following: - role OR - sys-id AND xms-name
sys-id	The Id of the cluster to view.	
xms-name	The name of the XMS.	

Example request

```
GET /api/json/v3/types/r-snapshot-sets?protection-session-id=PS.TW.01 HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-snapshot-sets/de8225a6432a4ec4aee81699f85125f9",
      "name": ""
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-snapshot-sets/70bcc0cc53bd4ecd863d59db87729086",
      "name": ""
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/r-snapshot-sets/",
      "rel": "self"
    }
  ]
}
```

Remote Snapshot Sets

Viewing the Details of a Remote Snapshot Set

GET /api/json/v3/types/r-snapshot-sets?protection-session-id=(protection-session-guid or protection-session-index or protection-session-name)>

This command (GET /api/json/v3/types/r-snapshot-sets?protection-session-id=[protection-session-guid or protection-session-index or protection-session-name]>) displays details of the selected Remote Snapshot Set.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
protection-session-id	The Remote Protection Session Id. Use either: - Protection session GUID - Protection session index - Protection session name	Yes
snapshot-set-id	The Id of the Snapshot-Set.	Yes
xms-name	The name of the XMS to which the Remote Snapshot-Set belongs.	No

Output Parameter	Description
certainty	Indicates confidence that the XMS and the cluster are synchronized. The value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
created-by-app	Denotes the application which created the object.
creation-time-long	The creation time of the Remote Snapshot-Set.
index	The index of the Remote Snapshot-Set.
name	The name of the Remote Snapshot-Set.

Remote Snapshot Sets

Output Parameter	Description
obj-severity	The Snapshot Set's severity, based on severity level of current Alerts (Alerts still uncleared) for this Volume Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
replication-session-pairing-label-id	The Replication Session Id containing this Volume Pair.
rm-id	The object Id of the replciation manage which controls the replication domain.
source-sys-id	For the source cluster on which this Volume-Pair resides, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
source-vol-size	The size of the Volume on the replication source side (in KB)
source-volume-id	Volume Id in the source cluster
source-volume-pair-id	The Volume pair Id in the source cluster.
target-sys-id	For the target cluster on which this Volume-Pair resides, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
target-vol-size	The size of the Volume on the replication target side (in KB).
target-volume-id	The Volume Id in target cluster.
target-volume-pair-id	The Volume pair Id in the target cluster

Remote Snapshot Sets

Output Parameter	Description
volume-pair-consistency-state	The state of this Volume-Pair from the local XMS. The state is based on property values in each Volume-Pair in the each cluster. The state of the combined Volume-Pairs is inconsistent in the following cases: • only one Volume-Pair with the pairing label was discovered (i.e., no pair in one of the clusters) • two Volume-Pair with the same pairing label were discovered, but there is a discrepancy in one or more persistent properties which determine the identity of an object as recorded in both clusters. Values: • unknown • consistent • inconsistent • inconsistent_roles

Example Request

GET /api/json/v3/types/r-snapshot-sets?protection-session-id=76036da0f4c442fca192d01129e69069&snapshot-set-id=2000064&full=1 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

Remote Snapshot Sets

```

{
  "content": [
    {
      "index": 2000064,
      "creation_time_long": "1523369418168",
      "name": "",
      "rep_snapset_state": "consistent",
      "sys_id": [
        "3ef2f53fd8594fd29e706efd8ed1be3",
        "x2-xb04",
        1
      ],
      "test_copy_in_progress": false,
      "href": "https://10.213.25.30/api/json/v3/types/r-snapshot-sets/359edb3e731843ef974550299bb7dbb2",
      "created_by_app": "native_rp_target",
      "xms_id": [
        "7375f15942b14dcfb4aec5e3f0557ad5",
        "vxms-x2-xb04",
        1
      ],
      "guid": "359edb3e731843ef974550299bb7dbb2",
      "session_name": "Marco_Rep_Session"
    },
    {
      "index": 2000067,
      "creation_time_long": "1523369454775",
      "name": "BM1",
      "rep_snapset_state": "consistent",
      "sys_id": [
        "3ef2f53fd8594fd29e706efd8ed1be3",
        "x2-xb04",
        1
      ],
      "test_copy_in_progress": false,
      "href": "https://10.213.25.30/api/json/v3/types/r-snapshot-sets/33a0ba081a40485ea194815d8c400c55",
      "created_by_app": "native_rp_target",
      "xms_id": [
        "7375f15942b14dcfb4aec5e3f0557ad5",
        "vxms-x2-xb04",
        1
      ],
      "guid": "33a0ba081a40485ea194815d8c400c55",
      "session_name": "Marco_Rep_Session"
    },
    {
      "index": 2000068,
      "creation_time_long": "1523369469998",
      "name": "BM2",
      "rep_snapset_state": "consistent",
      "sys_id": [
        "3ef2f53fd8594fd29e706efd8ed1be3",
        "x2-xb04",
        1
      ],
      "test_copy_in_progress": false,

```

```

        "href": "https://10.213.25.30/api/json/v3/types/r-snapshot-sets/d7cf9cea448f42d182f950c1d4850489",
        "created_by_app": "native_rp_target",
        "xms_id": [
            "7375f15942b14dcfb4aec5e3f0557ad5",
            "vxms-x2-xb04",
            1
        ],
        "guid": "d7cf9cea448f42d182f950c1d4850489",
        "session_name": "Marco_Rep_Session"
    },
    ...
    {
        "index": 2002296,
        "creation_time_long": "1523434225832",
        "name": "",
        "rep_snapset_state": "consistent",
        "sys_id": [
            "3ef2f53fd8594fd29e706e0fd8ed1be3",
            "x2-xb04",
            1
        ],
        "test_copy_in_progress": false,
        "href": "https://10.213.25.30/api/json/v3/types/r-snapshot-sets/198812d15ec547e7a8aa51265b12db0c",
        "created_by_app": "native_rp_target",
        "xms_id": [
            "7375f15942b14dcfb4aec5e3f0557ad5",
            "vxms-x2-xb04",
            1
        ],
        "guid": "198812d15ec547e7a8aa51265b12db0c",
        "session_name": "Marco_Rep_Session"
    }
],
"links": [
    {
        "href": "https://10.213.25.30/api/json/v3/types/r-snapshot-sets/",
        "rel": "self"
    }
]
}

```

Retention Policies

Viewing the List of Retention Policies

GET /api/json/v3/types/retention-policies

This command (GET /api/json/v3/types/retention-policies) displays information about the Retention Policies.

Example request

```
GET /api/json/v3/types/retention-policies HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/retention-
policies/",
      "rel": "self"
    }
  ],
  "retention-policies": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/retention-
policies/60203a3456354456852c0c5f1ad6853e",
      "name": "alexRP01",
      "sys-name": null
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/retention-
policies/866091af318146f58af32db8677329ea",
      "name": "Tier1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/retention-
policies/b72a3f3b752d421f9db79a5c5b290565",
      "name": "Local-Hourly",
      "sys-name": "xbrickdrm1652"
    },
    ...
  ]
}
```



```

    policies/75afe25c5ac84eccad5cdfff9485cc74",
      "name": "Local-Hourly",
      "sys-name": null
    }
  ]
}
```

Viewing the Details of a Retention Policy

GET /api/json/v3/types/retention-policies/<parameter (retention-policies-guid or retention-policies-index or ?name=retention-policies-name)>

This command (GET /api/json/v3/types/retention-policies/<parameter [retention-policies-guid or retention-policies-index or ?name=retention-policies-name]>) displays information about the selected Retention Policy.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
retention-policies-guid	A unique identifier for the Retention Policy.	Select one of the following: - retention-policies-guid - retention-policies-id - retention-policies-name
retention-policies-index	The index of the Retention Policy.	
retention-policies-name	The name of the Retention Policy.	
- cluster-index OR - cluster-name	The Cluster index or name of the Retention Policy.	- No – for single cluster configurations or if retention-policies-guid is specified - Yes – for multiple cluster configurations and if the retention-policies-guid is not specified
prop-list	Defines the command output	No

Retention Policies

Output Parameter	Description
certainty	Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent but the XMS is unable to determine the success of the request. Values: - ok - There is certainty that the XMS is synchronized - add_pending - An add request was made by the XMS but uncertain if it was executed. - modify_pending - A modify request was made by the XMS but uncertain if it was executed. - remove_pending - A remove request was made by the XMS but uncertain if it was executed.
index	The index of the Retention Policy.
long-period-duration	The duration of the long term period ranging from 1 to 500.
long-period-unit	The long term consolidation period unit. Values: - minutes - hours - days
long-retention-copies	The long term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use.
middle-period-duration	The duration of the middle term period ranging from 1 to 500.
middle-period-unit	The middle term consolidation period unit. Values: - minutes - hours - days
middle-retention-copies	The middle term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use
name	The name of the Retention Policy.
num-references	The total number of all objects and replication sessions using this policy.
protection-window-duration-in-days	The longest time a PIT is retained (in days). For example, a 25 hour total duration will be a protection window of 1.04 day.

Retention Policies

Output Parameter	Description
protection-window-num-copies	The total number of PIT copies retained, including copies for short term, middle term and long term.
replication-session-list	List of all replication sessions using this retention policy.
retention-policy-id	For this Retention Policy, a tuple array containing the following parameters (in the following order): the Retention Policy object GUID identifier, the Retention Policy name, and the Retention Policy index.
rm-id	The object Id of the RM which controls the replication domain.
short-period-duration	The duration of the short term period ranging from 1 to 500.
short-retention-copies	The short term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use
sys-id	For the cluster on which this Retention Policy resides, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index.
sys-index	Physical index of the system this object belongs to.

Retention Policies

Example request

```
GET /api/json/v3/types/retention-policies/1b3ba1c921fa4b6ca077d37c5e01ce08
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "num-of-replication-sessions": 1,
    "remote-xms-id": [
      "45a8036d3c1b4f249cd12efd6df0f69b",
      "vxms-xbrickdrm1652.xiodrm.lab.emc.com",
      1
    ],
    "xms-id": [
      "36b0474eca4240cca658740c198d0faf",
      "xms",
      1
    ],
    "remote-sys-id": [
      "a07f79e0989743e59a116500b3a4b80e",
      "xbrickdrm1652",
      1
    ],
    "replication-session-list": [
      [
        "b0ffa7eb4aa0494183df6f036953d017",
        "DBCg1-NY-NJ",
        1
      ]
    ],
    "short-retention-copies": 30,
    "protection-window-duration-in-days": 3.0,
    "middle-period-duration": 23,
    "guid": "1b3ba1c921fa4b6ca077d37c5e01ce08",
    "sys-id": [],
    "long-period-duration": 2,
    "index": 2,
    "middle-period-unit": "hours",
    "name": "Tier1",
    "middle-retention-copies": 23,
    "short-period-duration": 60,
    "certainty": "ok",
    "protection-window-num-copies": 55,
    "short-period-unit": "minutes",
    "long-retention-copies": 2,
    "long-period-unit": "days",
    "num-references": 1
  },
  "links": [
```

Retention Policies

```
{
  "guid": "1b3ba1c921fa4b6ca077d37c5e01ce08",
  "href": "https://vxms-xbrickdrm1648/api/json/v3/types/retention-
policies/1b3ba1c921fa4b6ca077d37c5e01ce08",
  "rel": "self"
}
```

Retention Policies

Adding a Retention Policy

POST /api/json/v3/types/retention-policies

This command (POST /api/json/v3/types/retention-policies) enables you to create a Retention Policy.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name or index number.	Yes
retention-policy-name	The name of the new Retention Policy.	Yes
short-period-duration	The duration of the short term period ranging from 1 to 500. Use units of "d" for days, "m" for minutes, or "h" hours. Do not mix units and use only integers. For example, "10m" for 10 minutes, or "1d" for 1 day.	Yes
short- period -copies	The short term retention number of copies ranging from 1 to 500.	Yes
middle-period-duration	The duration of the middle term period ranging from 1 to 500. Use units of "d" for days, "m" for minutes, or "h" hours. Do not mix units and use only integers. For example, "10m" for 10 minutes, or "1d" for 1 day.	No
middle - period -copies	The middle term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use.	No
long-period-duration	The duration of the long term period ranging from 1 to 500. Use units of "d" for days, "m" for minutes, or "h" hours. Do not mix units and use only integers. For example, "10m" for 10 minutes, or "1d" for 1 day.	No
long- period -copies	The long term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use.	No

Example

```
POST api/json/v3/types/remote-protections HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
```

Cache-Control: no-cache

```
{"name": "RT.TEST.01", "short-priod-duration": "10", "short-retention-copies": "25"}
```

Response

```
{
  "links": [
    {
      "guid": "e9537fdf2ce24a1a994410ff339a18e8",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/remote-
protections/e9537fdf2ce24a1a994410ff339a18e8",
      "rel": "self"
    }
  ]
}
```

Retention Policies

Copying Retention Policies from a Cluster to another Cluster

PUT /api/json/v3/commands/retention-policies/copy/<parameter (retention-policies-guid or retention-policies-index or ?name=retention-policies-name)>

This command (PUT /api/json/v3/commands/retention-policies/copy/<parameter [retention-policies-guid or retention-policies-index or ?name=retention-policies-name]>) enables you to copy a Retention Policy from one cluster to another cluster.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
retention-policies-guid	A unique identifier for the Retention Policy.	Select one of the following: - retention-policies-guid - retention-policies-id - retention-policies-name
retention-policies-index	The index of the Retention Policy.	
retention-policies-name	The name of the Retention Policy.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-cluster-id	The Id of source cluster from which to copy the Retention Policy	Yes
to-cluster-idi	The Id of target cluster to which to copy the Retention Policy.	Yes
to-xms-idi	The Id of the target cluster XMS.	No

Retention Policies

Input Parameter	Description	Mandatory
copy-all	Indicates whether to copy all Retention Policies on the source cluster to the target cluster. Values: - true – copy all Retention Policies - false – do not copy all Retention Policies Note: If the value is true, then retention-policy-id must be NULL.	No
retention-policy-id	The Id of the Retention Policy to copy. Note: If copy-all is false, retention-policy-id must not be NULL.	No

Example

```
PUT api/json/v3/commands/retention-policy/copy HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-sys-id":"xbrickdrm1648","to-sys-id":"xbrickdrm919"}
```

Response

Retention Policies

Modifying a Retention Policy

PUT /api/json/v3/types/retention-policies/<parameter (retention-policies-guid or retention-policies-index or ?name=retention-policies-name)>

This command (POST /api/json/v3/types/retention-policies/<parameter [retention-policies-guid or retention-policies-index or ?name=retention-policies-name]>) enables you to modify a Retention Policy.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
retention-policies-guid	A unique identifier for the Retention Policy.	Select one of the following: - retention-policies-guid - retention-policies-id - retention-policies-name
retention-policies-index	The index of the Retention Policy.	
retention-policies-name	The name of the Retention Policy.	
- cluster-index OR - cluster-name	The Cluster index or name of the Retention Policy.	- No – for single cluster configurations or if retention-policies-guid is specified - Yes – for multiple cluster configurations and if the retention-policies-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
name	The name of the new Retention Policy.	Yes

Retention Policies

Input Parameter	Description	Mandatory
short-period-duration	The duration of the short term period ranging from 1 to 500. Use units of "d" for days, "m" for minutes, or "h" hours. Do not mix units and use only integers. For example, "10m" for 10 minutes, or "1d" for 1 day.	Yes
short- period -copies	The short term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use	Yes
short- period -copies	The short term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use	No
long-period-duration	The duration of the long term period ranging from 1 to 500. Use units of "d" for days, "m" for minutes, or "h" hours. Do not mix units and use only integers. For example, "10m" for 10 minutes, or "1d" for 1 day.	No
long- period -copies	The long term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use	No
middle-period-duration	The duration of the middle term period ranging from 1 to 500. Use units of "d" for days, "m" for minutes, or "h" hours. Do not mix units and use only integers. For example, "10m" for 10 minutes, or "1d" for 1 day.	No
middlte-retention-copies	The middle term retention number of copies ranging from 1 to 500. The value of 0 indicates that this period is not in use	No
sys-id	The cluster on which the Retention Policy resides	No

Retention Policies

Example

```
PUT /api/json/v3/types/retention-policy/1b3ba1c921fa4b6ca077d37c5e01ce08
HTTP/1.1
```

```
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
```

```
Authorization: Basic *****
```

```
Cache-Control: no-cache
```

```
{"short-priod-duration":"10","short-retention-copies":"25"}
```

Response

```
{
  "links": [
    {
      "guid": "e9537fdf2ce24a1a994410ff339a18e8",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/remote-
protections/e9537fdf2ce24a1a994410ff339a18e8",
      "rel": "self"
    }
  ]
}
```

Removing a Retention Policy

DELETE /api/json/v3/types/retention-policies/<parameter (retention-policies-guid or retention-policies-index or ?name=retention-policies-name)>

This command (DELETE /api/json/v3/types/remote-protections/<parameter [retention-policies-guid or retention-policies-index or ?name=retention-policies-name]>) enables you to delete a Retention Policy.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
retention-policies-guid	A unique identifier for the Retention Policy.	Select one of the following: - retention-policies-guid - retention-policies-id - retention-policies-name
retention-policies-index	The index of the Retention Policy.	
retention-policies-name	The name of the Retention Policy.	
- cluster-index OR - cluster-name	The Cluster index or name of the Retention Policy.	- No – for single cluster configurations or if retention-policies-guid is specified - Yes – for multiple cluster configurations and if the retention-policies-guid is not specified

Retention Policies

Example

```
DELETE /api/json/v3/types/retention-policy/1b3ba1c921fa4b6ca077d37c5e01ce08
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "links": [
    {
      "guid": "e9537fdf2ce24a1a994410ff339a18e8",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/remote-
protections/e9537fdf2ce24a1a994410ff339a18e8",
      "rel": "self"
    }
  ]
}
```

Schedulers

Viewing the List of Schedulers

GET /api/json/v3/types/schedulers

This command (GET /api/json/v3/types/schedulers) displays the list of all Schedulers and their defined parameters.

Example request

```
GET /api/json/v3/types/schedulers HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "schedulers": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/schedulers/fab2bc2735a64ff09240784d3fc82625",
      "name": "",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/schedulers/657b1b6c14ee49cf88ed1c9bc65bb7f1",
      "name": "",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/schedulers/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of a Scheduler

GET /api/json/v3/types/schedulers/<parameter (scheduler-guid or scheduler-index or ?name= scheduler-name)>

This command (GET /api/json/v3/types/schedulers/<parameter [scheduler-

Schedulers

guid or scheduler-index or ?name= scheduler-name]>) displays details of the selected Scheduler.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
scheduler-guid	A unique identifier for the Scheduler.	Select one of the following: • scheduler-guid • scheduler - index • scheduler-name
scheduler-index	The index of the Scheduler.	
scheduler-name	The name of the Scheduler.	
• cluster-index - OR • cluster-name	The Cluster index or name of the Scheduler.	• No – for single cluster configurations or if scheduler-guid is specified • Yes – for multiple cluster configurations and if the scheduler-guid is not specified

Output Parameter	Description
enabled-state	Indicates whether the Scheduler is currently enabled or disabled, by the user.
guid	A unique identifier for the Scheduler.
index	Scheduler's index number as defined by the XMS upon its creation (a unique positive number)
in-progress	This is a Boolean indicating whether the scheduler is active.
last-activation-status	Indicates the state of the last Scheduler activation. Values: • successful - The last Scheduler activation was successful. • never_run - The Scheduler has never been run (e.g. when a suspended Scheduler was created by user).
last-activation-time	The last time Scheduler attempted to create Snapshots
name	Name of the Scheduler

Output Parameter	Description
obj-severity	Scheduler's severity, based on severity level of current Alerts (Alerts still uncleared) for this Scheduler. Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
parsed-schedule	The Schedule for creating Snapshots parsed to human readable format. For schedule-type of interval, contains the frequency as hours, minutes, and seconds; for example, "Every 10h:20m:15s". For schedule-type of explicit, contains the day of week, hour and minute; for example, "Every Sunday at 12:30".
schedule	The Schedule for creating Snapshot in the format used to add and modify a Schedule (not parse to human readable format). For schedule-type of interval, as hours, minutes, seconds; for example, every 10 hours and 30 minutes is "[10:30:0]". For schedule-type of explicit, as day of week, hour, minute; for example, every Sunday at 12:30 is "[1,12,30]".
scheduler-type	The scheduling for creating a Snapshot is interval-based or fixed-time based. Values: • <code>interval</code> - Snapshots are created in constant time intervals. • <code>explicit</code> - Snapshots are created at specified time.
snapped-object-id	The name or index of the object from which the Snapshot Set is created.
snapped-object-index	The index number of the Snapshotted object
snapped-object-name	The name of the Snapshotted object
snapped-object-type	The object type that was used to create this Snapshot
snapshots-to-keep-number	Defines the number of Snapshots to be saved.
snapshots-to-keep-time	The time period, in seconds, for which a Snapshot is retained. When the defined time has passed, the cluster automatically removes the Snapshot. • Minimum value is 60 (1 minute). • Maximum value is 15768000 (5 Years).

Schedulers

Output Parameter	Description
snapshot-type	Defines the Snapshot type. Values: - readonly - regular
suffix	A definable text adjoined to Scheduler's stem name
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags

Example Request

```
GET /api/json/v3/types/schedulers/775d52a9dd58452d93e7e6b7feff2c31 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "suffix": "",
    "scheduler-type": "interval",
    "schedule": "10:20:15",
    "in-progress": false,
    "obj-severity": "information",
    "snapshots-to-keep-time": "157680000",
    "tag-list": [],
    "sys-index": 1,
    "sys-name": "xbrickdrm919",
    "last-activation-status": "successful",
    "last-activation-time": "1517846807",
    "guid": "775d52a9dd58452d93e7e6b7feff2c31",
    "snapshot-type": "regular",
    "sys-id": [
      "7e0bbd4b7d69477ab32e2953636a70de",
      "xbrickdrm919",
      1
    ],
    "snapped-object-id": [
      "d28522b25a0b4c60b1be71af6418c386",
      "TWTS.10002000",
      39
    ],
    "index": 1,
    "snapped-object-index": 39,
    "name": "",
    "snapped-object-name": "TWTS.10002000",
    "snapshots-to-keep-number": 2,
    "enabled-state": "enabled",
    "snapped-object-type": "Volume",
    "parsed-schedule": "Every 10h:20m:15s"
  },
  "links": [
    {
      "guid": "775d52a9dd58452d93e7e6b7feff2c31",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/schedulers/775d52a9dd58452d93e7e6b7feff2c31",
      "rel": "self"
    }
  ]
}
```

Schedulers

Adding a New Scheduler

POST /api/json/v3/types/schedulers

This command (POST /api/json/v3/types/schedulers) enables you to create a new Scheduler.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
scheduler-name	Scheduler's name	Yes
scheduler-type	Type of Scheduler Values: - interval - explicit	Yes
snapshot-object-id	The Id of the Snapshotted object	Yes
snapshot-object-type	Type of the object used for snapshot - object - id Values: - Volume - ConsistencyGroup	Yes
time	Snapshot creation schedule Values: - If scheduler-type = interval use [h:m:s] - If scheduler-type = explicit use [d:h:m]	Yes
snapshots-to-keep-number	Number of Snapshots to be saved	Select one of the following: - snapshots-to-keep-number - snapshots-to-keep-time
snapshots-to-keep-time	The period of time for which a Snapshot should be retained. When the defined time has passed, the cluster automatically removes the Snapshot. - Minimum value is 60 (1 minute). - Maximum value is 15768000 (5 Years).	

Schedulers

Input Parameter	Description	Mandatory
enabled-state	Suspends or resumes Scheduler. Values: - user_disabled - enabled	No
snapshot-type	Defines the Snapshot type. Values: - readonly - regular	No
suffix	Text adjoined to the scheduler's stem name	No
tag-list	Tag list ID.	No

Example request

POST /api/json/v3/types/schedulers HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

```
{"cluster-id":"xbrickdrm919","scheduler-type":"interval","snapshot-object-id":"TWTS.10002000","snapshot-object-type":"Volume","snapshots-to-keep-number":2,"time":"10:20:15"}
```

Response

```
{
  "links": [
    {
      "guid": "775d52a9dd58452d93e7e6b7feff2c31",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/schedulers/775d52a9dd58452d93e7e6b7feff2c31",
      "rel": "self"
    }
  ]
}
```

Schedulers

Modifying a Scheduler

PUT /api/json/v3/types/schedulers/<parameter (scheduler-guid or scheduler-index or ?name= scheduler-name)>

This command (PUT /api/json/v3/types/schedulers/<parameter [scheduler-guid or scheduler-index or ?name= scheduler-name]>) enables you to modify a Scheduler.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
scheduler-guid	A unique identifier for the Scheduler.	Select one of the following: • scheduler-guid • scheduler - index • scheduler-name
scheduler-id	The index of the Scheduler.	
scheduler-name	The name of the Scheduler.	
• cluster-index OR • cluster-name	The Cluster index or name of the Scheduler.	• No – for single cluster configurations or if scheduler-guid is specified • Yes – for multiple cluster configurations and if the scheduler-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
scheduler-type	Type of Scheduler Values: - interval - explicit	No
snapshot-object-id	The Id of the Snapshotted object	No
snapshot-object-type	Type of the object used for snapshot - object - id Values: - Volume - SnapSet - ConsistencyGroup	No
snapshots-to-keep-number	The number of Snapshots to be saved	No
snapshots-to-keep-time	The period of time for which a Snapshot should be retained. When the defined time has passed, the cluster automatically removes the Snapshot. - Minimum value is 60 (1 minute). - Maximum value is 15768000 (5 Years).	No
snapshot-type	Defines the Snapshot type. Values: - readonly - regular	No
state	Suspends or resumes Scheduler. Values: - user_disabled - enabled	No
suffix	Text adjoined to the Scheduler stem name	No
time	Snapshot creation schedule Values: - If scheduler-type = interval use [h:m:s] - If scheduler-type = explicit use [d:h:m]	No

Schedulers

Example Request

```
PUT /api/json/v3/types/schedulers/775d52a9dd58452d93e7e6b7feff2c31 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"suffix": "TEST"}
```

Response

Note: The successful completion of this command returns no response.

Suspending a Scheduler

PUT /api/json/v3/commands/schedulers/suspend/<parameter (scheduler-guid or scheduler-index or ?name= scheduler-name)>

This command (PUT /api/json/v3/commands/schedulers/suspend/<parameter [scheduler-guid or scheduler-index or ?name= scheduler-name]>) enables you to suspend the operation of a Snapshot Set scheduler (local backup).

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
scheduler-guid	A unique identifier for the Scheduler.	Select one of the following: • scheduler-guid • scheduler - index • scheduler-name
scheduler-index	The index of the Scheduler.	
scheduler-name	The name of the Scheduler.	
• cluster-index OR • cluster-name	The Cluster index or name of the Scheduler.	• No – for single cluster configurations or if scheduler-guid is specified • Yes – for multiple cluster configurations and if the scheduler-guid is not specified

Schedulers

Example Request

```
PUT /api/json/v3/commands/schedulers/suspend/d2ec5767e5bc43149624d7db66962157
HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Resuming a Scheduler

PUT /api/json/v3/commands/schedulers/resume/<parameter (scheduler-guid or scheduler-index or ?name= scheduler-name)>

This command (PUT /api/json/v3/commands/schedulers/resume/<parameter [scheduler-guid or scheduler-index or ?name= scheduler-name]>) enables you to resume the operation of a Snapshot Set scheduler (local backup).

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
scheduler-guid	A unique identifier for the Scheduler.	Select one of the following: • scheduler-guid • scheduler - index • scheduler-name
scheduler-index	The index of the Scheduler.	
scheduler-name	The name of the Scheduler.	
• cluster-index OR • cluster-name	The Cluster index or name of the Scheduler.	• No – for single cluster configurations or if scheduler-guid is specified • Yes – for multiple cluster configurations and if the scheduler-guid is not specified

Schedulers

Example Request

```
PUT /api/json/v3/commands/schedulers/resume/d2ec5767e5bc43149624d7db66962157
HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{}
```

Note: This command requires an empty input body. For curl, you must use "-d {}" or "-data {}".

Response

Note: The successful completion of this command returns no response.

Removing a Scheduler

DELETE /api/json/v3/types/schedulers/<parameter (scheduler-id)>

This command (DELETE /api/json/v3/types/schedulers/<parameter [scheduler-id]>) enables you to delete a Scheduler.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
scheduler-id	The Id of the Scheduler.	• Yes
• cluster-index OR • cluster-name	Cluster's index	• No – for a single cluster configuration • Yes – for a multiple cluster configuration

Schedulers

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
remove-snapshot-sets	Indicates whether removing the Scheduler deletes all Snapshot-Sets created by the Scheduler. Values: • true - delete the Snapshot-Sets • false – do not delete the Snapshot-Sets Note: Deleting the Snapshot-Set is a best effort attempt to delete.	No

Example Request

```
DELETE /api/json/v3/types/schedulers/775d52a9dd58452d93e7e6b7feff2c31 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Secure Remote Services Notifiers

Viewing the List of Secure Remote Services Notifiers

GET /api/json/v3/types/syr-notifier

This command (GET /api/json/v3/types/syr-notifier) displays the list of the EMC Secure Remote Services (ESRS) Notifiers for EMC support interfaces (e.g. ESRS, email, FTPS).

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration
duration	Monitor duration (seconds).	No
frequency	Monitor frequency (seconds)	No

Secure Remote Services Notifiers**Example request**

```
GET /api/json/v3/types/syr-notifier HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "syr-notifier": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/syr-
notifier/32805dc91ae14a06bd28ad741dc152d3",
      "name": "syr_notifier"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/syr-
notifier/",
      "rel": "self"
    }
  ]
}
```


Viewing the Details of a Secure Remote Services Notifier

GET /api/json/v3/types/syr-notifier/<parameter (syr-notifier-guid or syr-notifier-index or ?name=syr-notifier-name)>

This command (GET /api/json/v3/types/syr-notifier/<parameter [syr-notifier-guid or syr-notifier-index or ?name=syr-notifier-name]>) displays the details of the selected EMC Secure Remote Services (ESRS) Notifier for an EMC support interface (e.g. ESRS, email, FTPS).

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
syr-notifier-guid	A unique identifier for the Secure Remote Services Notifier.	Select one of the following: - syr-notifier-guid - syr-notifier-id - syr-notifier-name
syr-notifier-index	The index of the Secure Remote Services Notifier.	
syr-notifier-name	The name of the Secure Remote Services Notifier.	
duration	Monitor duration (seconds).	No
frequency	Monitor frequency (seconds)	No

Output Parameter	Description
connectemc-config	The call home configuration settings currently applied.
connection-type	Indicates the type of connection from XMS to EMC Remote Services (ESRS). Values: - email - email - esrsgw – ESRS gateway - esrsvegw – ESRS-VE gateway
email-password	The password of the email user.
email-sender	The email sender name.
email-server	The email server name. This parameter can contain the fully qualified domain name (FQDN) of the email host or the IP address.
email-user	The email user name.

Secure Remote Services Notifiers

enabled	Indicates whether this Secure Remote Services Notifier is enabled. Values: - enabled - disabled
esrs-gw-host	If the connect-type is either esrsqw or esrsveqw, this parameter contains the gateway host (fully qualified domain name or IP address).
esrs-gw-host-secondary	If the connect-type is either esrsqw or esrsveqw, this parameter can contain the secondary gateway host (fully qualified domain name or IP address).
esrsve-api-version	If the connection-type is esrsgwve), contains the RestAPI version the gateway supports. Note: The first supported version is Release 3.
esrsve-clusters-connectivity	Indicates whether all clusters are connected/registered to the ESRS-VE gateway. Values: - connected - the XMS has full connectivity to ESRS-VE gateway, including the secondary ESRS gateway if configured - partially_disconnected - some of the clusters managed by this XMS are disconnected/unregistered to the ESRS-VE gateway. - all_clusters_disconnected - all of the clusters managed by this XMS are disconnected/unregistered to the ESRS-VE gateway.
esrsve-polling-interval	The polling interval towards the ESRS-VE gateway (hours). The default value is 24.
frequency	The frequency that the notification is sent to SYR (hours).
guid	The globally unique identifier of this Secure Remote Services Notifier.
index	The index of this Secure Remote Services Notifier.
name	The name of this Secure Remote Services Notifier.
obj-severity	The Secure Remote Services Notifier's severity, based on severity level of current Alerts (Alerts still uncleared) for this Secure Remote Services Notifier. Values: - clear - No Alerts exist for this entity. - information - The highest severity for this entity and all contained objects is information. - minor - The highest severity for this entity and all contained objects is minor. - major - The highest severity for this entity and all contained objects is major. - critical - The highest severity for this entity and all contained objects is critical.

Secure Remote Services Notifiers

psnt	The Product Serial Number Tag (PSNT) part number of the associated cluster.
site-name	This Secure Remote Services Notifier's cluster location site name. This value can contain spaces.
sys-id	For the cluster to which this Secure Remote Services Notifier belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
xms-id	For the XMS to which this Secure Remote Services Notifier belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Secure Remote Services Notifiers

Example Request

```
GET /api/json/v3/types/syr-notifier?name=syr_notifier HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "xms-id": [
      "5e9b962c7d844ab684d5252945792cb7",
      "xms",
      1
    ],
    "obj-severity": "information",
    "site-name": "user tech",
    "email-server": null,
    "sys-index": "",
    "connection-type": "esrsgw",
    "frequency": 36000,
    "sys-name": "",
    "esrsve-clusters-connectivity": "",
    "esrs-gw-host": "10.10",
    "guid": "00bf930ce2f8416d92c317e576980629",
    "esrs-gw-host-secondary": "31.77.178.199",
    "sys-id": [],
    "name": "syr_notifier",
    "esrsve-api-version": "3",
    "index": 1,
    "psnt": [
      "XI000154819281"
    ],
    "enabled": false,
    "email-user": null,
    "esrsve-polling-interval": 24,
    "connectemc-config": "---->\nConnectionType: ESRS Gateway
(Legacy)\nURL: https://10.10:443/incoming\nURL-secondary:
https://31.77.178.199:443/incoming\nSite Name: user tech\nPSNT: XI000154819281",
    "email-password": "xxxxxxx",
    "email-sender": null
  },
  "links": [
    {
      "guid": "00bf930ce2f8416d92c317e576980629",
      "href": "https://vxms-xbrickdrm1179/api/json/v3/types/syr-
notifier/00bf930ce2f8416d92c317e576980629",
      "rel": "self"
    }
  ]
}
```

Modifying a Secure Remote Services Notifier

PUT /api/json/v3/types/syr-notifier/<parameter (syr-notifier-guid or syr-notifier-index or ?name=syr-notifier-name)>

This command (GET /api/json/v3/types/syr-notifier/<parameter [syr-notifier-guid or syr-notifier-index or ?name=syr-notifier-name]>) modifies the selected EMC Secure Remote Services (ESRS) Notifier for an EMC support interface (e.g. ESRS, email, FTPS).

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
syr-notifier-guid	A unique identifier for the Secure Remote Services Notifier.	Select one of the following: • syr-notifier-guid • syr-notifier-id • syr-notifier-name
syr-notifier-index	The index of the Secure Remote Services Notifier.	
syr-notifier-name	The name of the Secure Remote Services Notifier.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
connection-type	Indicates the type of connection from XMS to ESRS. Values: • email - email • esrsgw – ESRS gateway • esrsvegw – ESRS-VE gateway	Select one of the following: • connection-type • enabled • disable • frequency • reset-configuration • site-name
disable	Indicates whether this EMC Secure Remote Service (ESRS) notifier is disabled. Values: • enabled • disabled	
enabled	Indicates whether this EMC Secure Remote Service (ESRS) notifier is enabled. Values: • enabled • disabled	

Secure Remote Services Notifiers

frequency	The frequency that the dossier is sent to SYR (hours).	
reset-configuration	Indicates whether the current configuration will be reset/cleared without applying an alternate configuration.	
site-name	This Syr-Notifier's cluster location site name. This value can contain spaces.	
email-password	The password of the email user.	No
email-recipient	The email recipient for the redirection of this EMC Secure Remote Service (ESRS) notifier.	No
email-sender	The email sender name.	No
email-server	The email server name. This parameter can contain the fully qualified domain name (FQDN) of the email host or the IP address.	No
email-user	The email user name.	No
esrs-gw-host	If the connect-type is either esrsqw or esrsveqw, this parameter contains the gateway host (fully qualified domain name or IP address).	No
esrs-gw-host-secondary	If the connect-type is either esrsqw or esrsveqw, this parameter can contain the secondary gateway host (fully qualified domain name or IP address).	No
esrsve-polling-interval	The polling interval towards the ESRS-VE gateway (hours). The default value is 24.	No
password	The ESRS-VE password.	No
username	The ESRS-VE username.	No

Example Request

```
PUT /api/json/v3/types/syr-notifier/32805dc91ae14a06bd28ad741dc152d3 HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"frequency":"43200","esrsve-polling-interval":"12"}
```

Response

Note: The successful completion of this command returns no response.

Slots

Slots

Viewing the List of Slots

GET /api/json/v3/types/slots

This command (GET /api/json/v3/types/slots) displays the list of Slots.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

GET /api/json/v3/types/slots HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "slots": [
    {
      "href": "https://vxms-xbrickdr
xbrickdr1652/api/json/v3/types/slots/eaec5256d2db42b381a35ebbf720eb3f",
      "name": "1_0",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdr
xbrickdr1652/api/json/v3/types/slots/dca6ac2107024081ba26733103e98412",
      "name": "1_0",
      "sys-name": "xbrickdr1652"
    },
    {
      "href": "https://vxms-xbrickdr
xbrickdr1652/api/json/v3/types/slots/431ccc139cac46ee86602793063885e7",
      "name": "1_1",
      "sys-name": "xbrickdr1652"
    }
  ]
}
```



```
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/slots/c2df5d50d8c549e7b7baae294fcf293c",
      "name": "1_1",
      "sys-name": "xbrick224-rename"
    },
    ...
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/slots/b2f5c5e1acc146a28d6bfe2a1f267cb0",
      "name": "1_71",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/slots/",
      "rel": "self"
    }
  ]
}
```

Slots

Viewing the Details of a Slot

GET /api/json/v3/types/slot/<parameter (slot-guid) or slot-index or ?name=slot-name>

This command (GET /api/json/v3/types/slot/<parameter [slot-guid or slot-index or ?name=slot-name]>) displays the details of the selected Slot.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
slot-guid	A unique identifier for the Slot.	Select one of the following: - slot-guid - slot-id - slot-name
slot-index	The index of the Slot.	
slot-name	The name of the Slot.	
- cluster-index - OR - cluster-name	The Cluster index or name of the Slot.	- No – for single cluster configurations or if slot-guid is specified - Yes – for multiple cluster configurations and if the slot-guid is not specified

Output Parameter	Description
brick-id	For the X-Brick to which this Slot belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The X-Brick's name.
failure-reason	The reason why the FRU is diagnosed as failed.
guid	The globally unique identifier of this Slot.
index	Slot's index number as defined by the XMS upon its creation (a unique positive number)

Output Parameter	Description
name	Slot's name
obj-severity	Slot's severity, based on severity level of current Alerts (Alerts still uncleared) for this Slot. Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
product-model	Product model number
slot-error-reason	This parameter contains more information regarding an error when slot_state shows the value error or unsupported_disk.
slot-num	Number of the Slot
slot-power-state	Indicates the slot's power state. Values: • On – The slot power is on. • Off – The slot power is off.
slot-state	The Slot's current state/content Values: • empty – Slot is empty and is not expected to be used. • unanticipated_disk – Slot is expected to be empty but a disk is inserted. • unsupported_disk – Disk of an unsupported model is inserted into the slot. • uninitialized_disk – Disk has been inserted and is detected as working. A command from a technician is required to integrate the SSD into the system. • error – Error in detecting disk. • ok – Disk is OK and in use.
ssd-o-signature	The signature added to the SSD once it is added to the DPG
ssd-size	The overall size of the SSD
ssd-uid	• UID (unique identification) of the SSD that is inserted into the Slot. • Parameter contains a value only if the slot state is: resident SSD, uninitialized SSD, or foreign XtremAPP SSD. Otherwise it is null

Slots

Output Parameter	Description
sys-id	For the cluster to which this Slot belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
xms-id	For the XMS to which this Slot belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

GET /api/json/v3/types/slots?name1_71 HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "content": {
    "ssd-size": "0",
    "xms-id": [
      "5e9b962c7d844ab684d5252945792cb7",
      "xms",
      1
    ],
    "failure-reason": "none",
    "obj-severity": "information",
    "product-model": "0",
    "sys-index": 1,
    "slot-error-reason": "none",
    "ssd-uid": "",
    "sys-name": "xbrickdrm1179",
    "slot-state": "empty",
    "guid": "52ed74225b114ec6bc83a1ca49dda21c",
    "sys-id": [
      "ed59e939575c48a2bb25554b08732430",
      "xbrickdrm1179",
      1
    ],
    "index": 72,
    "name": "1_71",
    "brick-id": [
      "f67e336d91eb4ad48618f92e7d26752d",
      "x1",
      1
    ],
  },
}
```

```
    "ssd-o-signature": "7c2d52656e656e2048616c6c616b2d7c",
    "slot-num": 71,
    "slot-power-state": "on",
    "brick-name": "X1",
    "brick-index": 1
  },
  "links": [
    {
      "guid": "52ed74225b114ec6bc83a1ca49dda21c",
      "href": "https://vxms-
xbrickdrm1179/api/json/v3/types/slots/52ed74225b114ec6bc83a1ca49dda21c",
      "rel": "self"
    }
  ]
}
```

Snapshot Groups

Snapshot Groups

Viewing the List of Snapshot Groups

GET /api/json/v3/types/snapshot-groups

This command (GET /api/json/v3/types/snapshot-groups) displays the list of all Snapshot Groups.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

GET /api/json/v3/types/snapshot-groups HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "snapshot-groups": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-groups/3870619532f24dcfb4d6fa67bfdd773b",
      "name": "",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-groups/65fbe8b8f8c846948955df5adb7111e5",
      "name": "",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-
```

Snapshot Groups

```
groups/880b0f85c9a147f29c5f9be9b2b601e2",
  "name": "",
  "sys-name": "xbrick224-rename"
},
...
{
  "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-
groups/ed38e56bf50a4eaba9ec699287e124bd",
  "name": "",
  "sys-name": "xbrickdrm1652"
},
"links": [
{
  "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-
groups/",
  "rel": "self"
}
]
```

Snapshot Groups

Viewing the Details of Snapshot Groups

GET /api/json/v3/types/snapshot-groups/<parameter (snapshot-group-guid or snapshot-group-index or ?name= snapshot-group-name)>

This command (GET /api/json/v3/types/snapshot-groups/<parameter [snapshot-group-guid or snapshot-group-index or ?name=snapshot-group-name]>) displays the selected Snapshot Group's details.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
snapshot-group-guid	A unique identifier for the Snapshot Group.	Select one of the following: • snapshot-group-guid • snapshot-group-index • snapshot-group-name
snapshot-group-index	The index of the Snapshot Group.	
snapshot-group-name	The name of the Snapshot Group.	
• cluster-index - OR • cluster-name	The Cluster index or name of the Snapshot Group.	• No – for single cluster configurations or if snapshot-group-guid is specified • Yes – for multiple cluster configurations and if the snapshot-group-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
snapshot-group-guid	A unique identifier for the Snapshot Group.	Yes

Snapshot Groups

Output Parameter	Description
consistency-state	The state of this Snapshot-Group according to the local XMS. Values: - unknown - consistent - inconsistent
guid	The object GUID identifier for this Snapshot-Group.
obj-severity	The this Snapshot-Group's severity, based on severity level of current Alerts (Alerts still uncleared) for this this Snapshot-Group. Values: - clear - No Alerts exist for this entity. - information - The highest severity for this entity and all contained objects is information. - minor - The highest severity for this entity and all contained objects is minor. - major - The highest severity for this entity and all contained objects is major. - critical - The highest severity for this entity and all contained objects is critical.
calculate-savings-timestamp	The time (in UTC) of the last scan of the Snapshot Sets in the Snapshot Group to calculate metrics.
certainty	Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent but the XMS is unable to determine the success of the request. Values: - ok - There is certainty that the XMS is synchronized - add_pending - An add request was made by the XMS but uncertain if it was executed. - modify_pending - A modify request was made by the XMS but uncertain if it was executed. - remove_pending - A remove request was made by the XMS but uncertain if it was executed.
copy-efficiency	The metric indicating the ratio of Snapshot logical space compared to actual space in use for all Volumes.
data-reduction-ratio	The data reduction ratio per Volume Snapshot Group.
index	The index of the Snapshot Group.
logical-space-in-use	The space in the Snapshot Group in use counting non-zero blocks only (in KB). The 16KB blocks that are shared among Snapshots are counted only once.
name	The name of Snapshot Group.
num-of-internal-vols	Indicates the number of internal Volumes in this Snapshot Group, created by non-XMS entities such as RecoverPoint or ODX.

Snapshot Groups

Input Parameter	Description	Mandatory
snapshot-group-guid	A unique identifier for the Snapshot Group.	Yes
Output Parameter	Description	
num-of-vols	The number of Volumes in this Snapshot Group	
reached-max-snapshots	Indicates whether the system has reached the maximum number of Snapshots allowed for this Snapshot Group counting all Snapshots including those that were deleted by the user but still consume resources.	
removing-snapshots-in-progress	Indicates whether the system is now deleting or merging Snapshots. Values: - true - false	
snapgrp-id	The Id of the Snapshot Group object.	
sys-id	For the cluster to which this Snapshot Group belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.	
sys-index	The physical index of the system this object belongs to.	
sys-name	The name of the system this Snapshot Group belongs to.	
thin-provisioning-ratio	The ratio comparing the logical space in use to the Volume size including all Volumes of then Snapshot Group.	
unique-physical-space	The minimal amount of physical capacity that will be reclaimed when deleting the Snapshot Group.	
vol-list	The list of Volumes that belong to this Snapshot Group	
vol-size	The total size of all the Snapshot Group Volumes (in KB).	

Example Request

```
GET /api/json/v3/types/snapshot-groups/90cb2ff6b85f421483994aebc231d043
HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Snapshot Groups

Response

```

{
  "content": {
    "num-of-vols": 18,
    "obj-severity": "information",
    "calculate-savings-timestamp": "",
    "sys-index": 1,
    "removing-snapshots-in-progress": false,
    "sys-name": "xbrickdrm1179",
    "vol-size": "184320",
    "guid": "90cb2ff6b85f421483994aebc231d043",
    "vol-list": [
      [
        "f545bd3cc00d4c87a24721d7b954d063",
        "ReadOnlyPrefillObj_643.1535346000957-1",
        2001185
      ]
    ],
    "sys-id": [
      "ed59e939575c48a2bb25554b08732430",
      "xbrickdrm1179",
      1
    ],
    "logical-space-in-use": "0",
    "index": 226,
    "data-reduction-ratio": "0",
    "copy-efficiency": "0",
    "name": "",
    "snapgrp-timestamp": null,
    "certainty": "ok",
    "num-of-internal-vols": 0,
    "thin-provisioning-ratio": 0.0,
    "consistency-state": null,
    "unique-physical-space": "0",
    "snapgrp-id": [
      "90cb2ff6b85f421483994aebc231d043",
      "",
      226
    ],
    "reached-max-snapshots": false
  },
  "links": [
    {
      "guid": "90cb2ff6b85f421483994aebc231d043",
      "href": "https://vxms-xbrickdrm1179/api/json/v3/types/snapshot-groups/90cb2ff6b85f421483994aebc231d043",
      "rel": "self"
    }
  ]
}

```

Calculating the Saving Metrics for Snapshot Groups

PUT /api/json/v3/commands/snapshot-groups/calculate-savings

The command (PUT /api/json/v3/commands/snapshot-groups/calculate-savings) enables you to scan Snapshot Sets and calculate the savings metrics.

Note: Savings metrics are shown in the unique-physical-space parameter of Volumes and Snapshot-Groups.

Note: To view a list of the Volumes scanned for savings metrics, see [Viewing the List of Volumes Scanned for Savings Metrics](#) on page 646. To view the savings metrics for a specific Volume, see either [Viewing the Details of a Volume](#) on page 606 or [Viewing the List of Volumes Scanned for Savings Metrics](#) on page 646. To view savings metrics for a Snapshot-Group, see [Viewing the Details of Snapshot Groups](#) on page 480.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cg-id	The identifier of the Consistency Group whose Snapshot Set metrics will be calculated.	Select either one of the following: - cg-id - cg-list - vol-id - vol-list
cg-list	The list of unique identifier(s) of the Consistency Group(s) whose Snapshot Set metrics will be calculated.	
vol-id	The identifier of the Volume whose Snapshot Set metrics will be calculated.	
vol-list	The list of unique identifier(s) of the Volume(s) whose Snapshot Set metrics will be calculated.	
cluster-id	The name or index of the Cluster to which the Snapshot Set belongs.	No

Snapshot Groups

Example

```
PUT /api/json/v3/commands/snapshot-groups/calculate-savings HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"cg-list":["eaf217691eca4faca5a948a2115b65b6"]}]}
```

Response

Note: The successful completion of this command returns no response.

Snapshot Sets

Viewing the List of Snapshot Sets

GET /api/json/v3/types/snapshot-sets

This command (GET /api/json/v3/types/snapshot-sets) displays the list of all Snapshot Sets.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

GET /api/json/v3/types/snapshot-sets HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Snapshot Sets

Response

```
{
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/",
      "rel": "self"
    }
  ],
  "snapshot-sets": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/beed3dec36d64e97bd9a6236e204a66d",
      "name": "SnapshotSet.1530615507039",
      "sys-name": "xbrickdrm1652"
    },
    ...
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/d613456275ad4a839e140820b687efc6",
      "name": "SnapShotSet.bck.1531667994507",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/99fd2aaf12e14cd9b914e921e0d6800d",
      "name": "SnapShotSet.bck.1531668026228",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/3fc804c1ec934943acdcf45feb12e207",
      "name": "",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/b0aca7c371684d00b508962062ff1db0",
      "name": "",
      "sys-name": "xbrickdrm1652"
    }
  ]
}
```


Viewing the Details of a Snapshot Set

GET /api/json/v3/types/snapshot-sets/<parameter (snapshot-set-guid) or snapshot-set-index or ?name= snapshot-set-name)>

This command (GET /api/json/v3/types/snapshot-set/<parameter [snapshot-guid or snapshot-set-index or ?name=snapshot-set-name]>) displays the selected Snapshot Set’s details.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
snapshot-set-guid	A unique identifier for the Snapshot Set.	Select one of the following: • snapshot-set-guid • snapshot-set-id • snapshot- set-name
snapshot-set-index	The index of the Snapshot Set.	
snapshot-set-name	The name of the Snapshot Set.	
• cluster-index OR • cluster-name	The Cluster index or name of the Snapshot Set.	• No – for single cluster configurations or if snapshot-set-guid is specified • Yes – for multiple cluster configurations and if the snapshot-set-guid is not specified

Output Parameter	Description

Snapshot Sets

Output Parameter	Description
certainty	Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent but the XMS is unable to determine the success of the request. Values: - ok - There is certainty that the XMS is synchronized - add_pending - An add request was made by the XMS but uncertain if it was executed. - modify_pending - A modify request was made by the XMS but uncertain if it was executed. - remove_pending - A remove request was made by the XMS but uncertain if it was executed.
created-by-app	Denotes the application which created the object.
guid	The globally unique identifier of this Snapshot Set.
retention-time	The time to keep the Snapshot Set. If the retention-time is 0, the Snapshot Set will be kept indefinitely until explicitly deleted).
session-name	The of the Local Protection Session associated with the Snapshot-Set.
vol-list-guids	A list of the object GUID identifiers of the Volumes associated with the Snapshot-Set.
cg-id	For the Consistency Group from which the Snapshot was created, a tuple array containing the following parameters (in the following order): the Consistency Group object GUID identifier, the Consistency Group name, and the Consistency Group index.
cg-name	Name of the Consistency Group
cg-oid	Consistency Group object ID/identifier
created-from-obj-id	The Id of the object from which the Snapshot Set was created (for X2 clusters only)
creation-time-long	Snapshot Set's creation date and time
index	Snapshot Set's index number as defined by the XMS upon its creation (a unique positive number)
name	Snapshot Set's name Note: If a Snapshot Set name is not defined by the user or application, the given name is SnapshotSet . epoch.
num-of-vols	Number of Volumes in the Snapshot Set

Snapshot Sets

Output Parameter	Description
obj-severity	Snapshot Set's severity, based on severity level of current Alerts (Alerts still uncleared) for this Snapshot Set Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
owner-id	The application entity identification that created this SnapShotSet.
rep-snapset-state	Indicates whether the SnapShotSet is consistent with the source (i.e., is it in the process of being replicated and therefore not consistent). Values: • <code>none</code> – no replication is defined. • <code>consistent</code> – the Snapshot-Set is consistent with the source • <code>incomplete</code> – the Snapshot-Set is not consistent with source
snapset-id	Index number of the Snapshot Set object
snapset-short-id	Short ID, created by SYM, not used by the XMS. Used by external interfaces such as RecoverPoint.
sys-id	For the cluster to which this Snapshot Set belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags
vol-list	The list of unique identifiers of the Volume(s) belonging to this Snapshot Set

Snapshot Sets

Example Request

```
GET /api/json/v3/types/snapshot-sets?name=SnapShotSet.1535367601036-1 -X
HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "created-by-app": "scheduler",
    "session-name": "ReadOnlyPrefillObj_643",
    "obj-severity": "information",
    "created-from-obj-id": "80fb77716d1e4004833edf796eabc225",
    "num-of-vols": 1,
    "tag-list": [],
    "snapshot-id": [
      "fdeb86d76e6142b89d06bcb0b57c9815",
      "SnapShotSet.1535367601036-1",
      2001970
    ],
    "sys-index": 1,
    "sys-name": "xbrickdrm1179",
    "guid": "fdeb86d76e6142b89d06bcb0b57c9815",
    "vol-list": [
      [
        "d9a8a9f68fd1406b9eb50c05cb14c796",
        "ReadOnlyPrefillObj_643.1535367601036-1",
        2001227
      ]
    ],
    "sys-id": [
      "ed59e939575c48a2bb25554b08732430",
      "xbrickdrm1179",
      1
    ],
    "rep-snapshot-state": "init",
    "index": 2001970,
    "name": "SnapShotSet.1535367601036-1",
    "retention-time": "0",
    "vol-list-guids": [
      [
        "d9a8a9f68fd1406b9eb50c05cb14c796"
      ]
    ],
    "snapshot-short-id": 65535,
    "cg-name": null,
    "cg-oid": [],
    "creation-time-long": "1535367600811",
    "owner-id": "242ceb3c2f90414bac61d0c485b2a381",
    "certainty": "ok",
    "cg-id": null
  }
}
```

Snapshot Sets

```
    },  
    "links": [  
      {  
        "guid": "fdeb86d76e6142b89d06bcb0b57c9815",  
        "href": "https://vxms-xbrickdrm1179/api/json/v3/types/snapshot-  
sets/fdeb86d76e6142b89d06bcb0b57c9815",  
        "rel": "self"  
      }  
    ]  
  }  
}
```

Snapshot Sets

Renaming a Snapshot Set

PUT /api/json/v3/types/snapshot-sets/<parameter (snapshot-set-guid) or snapshot-set-index or ?name= snapshot-set-name>

This command (PUT /api/json/v3/types/snapshot-sets/<parameter [snapshot-set-guid or snapshot-set-index or ?name= snapshot-set-name]>) enables you to rename a Snapshot Set.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
snapshot-set-guid	A unique identifier for the Snapshot Set.	Select one of the following: • snapshot-set-guid • snapshot-set-id • snapshot-set-name
snapshot-set-index	The index of the Snapshot Set.	
snapshot-set-name	The name of the Snapshot Set.	
• cluster-index OR • cluster-name	The Cluster index or name of the Snapshot Set.	• No – for single cluster configurations or if snapshot-set-guid is specified • Yes – for multiple cluster configurations and if the snapshot-set-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Snapshot Sets

Input Parameter	Description	Mandatory
new-name	The new name of the Snapshot Set.	Yes

Note: A cluster can also be defined as `cluster-name` or `cluster-index` in the URL, however the cluster definition should only be entered in one location, either the URL or the body.

Example Request

PUT /api/json/v3/types/snapshot-sets/6c166d56dd7c47158a82f764a26c4bf4 HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{ "new-name": "SnapShotSet.1516890205599.TEST" }

Response

Note: The successful completion of this command returns no response.

Snapshot Sets

Creating a Repurpose Copy of a Snapshot Set

PUT /api/json/v3/commands/snapshot-sets/create-repurpose-copy

For X1 cluster types, the command (PUT /api/json/v3/commands/snapshot-sets/create-repurpose-copy) creates Snapshot-Sets with regular Volumes.

For X2 cluster types, this command creates linked Consistency Groups with regular Volumes, **provided** that the Snapshot-Set originated from an existing Consistency Group. Otherwise it creates Snapshot-Sets with regular Volumes.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-snapshot-set-id	The unique identifier of the Snapshot-Set from which the new linked Consistency Group will be created.	Yes
cluster-id	The name or index of the Cluster to which the Consistency Group belongs.	No
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume associated with the repurpose copy of the Snapshot Set.	No
management-locked	This indicates whether the new Volume(s) created by this command will be defined as management-locked Volumes. Management-locked Volumes cannot be deleted and their data cannot be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked	No

Snapshot Sets

Input Parameter	Description	Mandatory
new-snapshot-set-name	The name of the new Snapshot-Set to create. The only valid characters are alphanumeric, spaces and the following characters ~!@#\$\$%^*_+{} :~.~.	No
new-consistency-group-name	The name of the new Consistency Group to create. The only valid characters are alphanumeric, spaces and the following characters ~!@#\$\$%^*_+{} :~.~.	No
new-vol-suffix	The suffix of the newly created Snapshot-Set. If a suffix is not provided, then the existing Volume name will be used and the suffix will be an Epoch format timestamp (seconds since 1/1/1970). A timestamp is used because unnamed Snapshot Sets are not supported.	No
qos-policy-id	For the QoS Policy associated with this Consistency Group, a tuple array containing the following parameters (in the following order): the QoS Policy object GUID identifier, the QoS Policy name, and the QoS Policy index.	No
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Consistency Group: Values: - disabled – the QoS Policy is not enforced - enabled – the QoS Policy is enforced - monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected. The default value is enabled.	No
Output Parameter	Description	
snapshot-set	The href, object GUID identifier, index, and name of the new Snapshot-Set.	
volumeIndex	A list of Volumes in the Volumes.	

Snapshot Sets

Example

```
PUT /api/json/v3/commands/snapshot-sets/create-repurpose-copy'HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-snapshot-set-id":2051689,"new-consistency-group-name":"AlexI-
test01"}
```

Response

```
{
  "content": {
    "volumes": [
      {
        "href": "https://vxms-
xbrick793/api/json/v3/types/volumes/b6692bf44ec0445e8213a8e42d99aebe",
        "index": 78,
        "guid": "b6692bf44ec0445e8213a8e42d99aebe",
        "name": "test-2.-cg-pc.1563088326043.1563090242542"
      },
      {
        "href": "https://vxms-
xbrick793/api/json/v3/types/volumes/7345663fc9b840279bf77e8108594fcf",
        "index": 79,
        "guid": "7345663fc9b840279bf77e8108594fcf",
        "name": "test-1.-cg-pc.1563088326043.1563090242542"
      }
    ],
    "consistency-group": {
      "href": "https://vxms-xbrick793/api/json/v3/types/consistency-
groups/1e117a4b83bf44a6887e6d09c6c0b38a",
      "index": 17,
      "guid": "1e117a4b83bf44a6887e6d09c6c0b38a",
      "name": "AlexI-test011"
    }
  },
  "links": [
    {
      "href": "https://vxms-xbrick793/api/json/v3/commands/snapshot-
sets/create-repurpose-copy/",
      "rel": "self"
    }
  ]
}
```

Creating a Protection Copy of a Snapshot Set

PUT /api/json/v3/commands/snapshot-sets/create-protection-copy

This command (PUT /api/json/v3/commands/snapshot-sets/create-protection-copy) enables you to create a read-only Snapshot of an existing Snapshot Set.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-snapshot-set-id	The unique identifier of the Snapshot Set to copy.	Yes
cluster-id	The name or index of the system to which this Volume belongs.	No
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume associated with the repurpose copy of the Snapshot Set.	No
management-locked	This indicates whether the new Volume(s) created by this command will be defined as management-locked Volumes. Management-locked Volumes cannot be deleted and their data cannot be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked	No
new-vol-suffix	The suffix of the newly created Snapshot-Set. If a suffix is not provided, then the existing Volume name will be used and the suffix will be an Epoch format timestamp (seconds since 1/1/1970). A timestamp is used because unnamed Snapshot Sets are not supported.	No
new-snapshot-set-name	The new name of the new Snapshot Set.	No

Snapshot Sets

Example Request

```
PUT /api/json/v3/commands/snapshot-sets/create-protection-copy HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-snapshot-set-id":["fb90a58c37ff417993d4c27ca6502d08"]}
```

Response

```
{
  "content": {
    "volumes": [
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/ee648f11bac64d51952aa53efaf5facf",
        "index": 111,
        "guid": "ee648f11bac64d51952aa53efaf5facf",
        "name": "DB02.1522209688317.1528628730078.1528629023723"
      },
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/2db794f90a7d474286d8ec30ab0f00e5",
        "index": 112,
        "guid": "2db794f90a7d474286d8ec30ab0f00e5",
        "name": "DB03.1522209688317.1528628730078.1528629023723"
      },
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/8c1410b937fe4d9fb0ebda16734dd038",
        "index": 113,
        "guid": "8c1410b937fe4d9fb0ebda16734dd038",
        "name": "DB01.1522209688317.1528628730078.1528629023723"
      }
    ],
    "snapshot-set": {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/f772e718dae048aea402478fd61b6aaa",
      "index": 33,
      "guid": "f772e718dae048aea402478fd61b6aaa",
      "name": "SnapshotSet.1528629023723"
    }
  },
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/commands/snapshot-sets/create-protection-copy/",
      "rel": "self"
    }
  ]
}
```

Snapshot Sets

Removing a Snapshot Set

DELETE /api/json/v3/types/snapshot-sets/<parameter (snapshot-set-guid) or snapshot-set-index or ?name= snapshot-set-name>

This command (DELETE /api/json/v3/types/<parameter [snapshot-set-guid or snapshot-set-index or ?name= snapshot-set-name]>) enables you to delete a Snapshot Set.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ss-id	The name or index of the Snapshot-Set.	Yes
snapshot-set-guid	A unique identifier for the Snapshot Set.	Select one of the following: • snapshot-set-guid • snapshot-set-id • snapshot- set-name
snapshot-set-index	The index of the Snapshot Set.	
snapshot-set-name	The name of the Snapshot Set.	
• cluster-index - OR • cluster-name	The Cluster index or name of the Snapshot Set.	• No – for single cluster configurations or if snapshot-set-guid is specified • Yes – for multiple cluster configurations and if the snapshot-set-guid is not specified

Note: A cluster can also be defined as `cluster-id` in the body, however the cluster definition should only be entered in one location, either the URL or the body.

Example Request

```
DELETE /api/json/v3/types/snapshot-sets?name=SnapshotSet.1434608980&cluster-  
name=xbrickdrm353 HTTP/1.1  
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com  
Authorization: Basic *****  
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

SNMP Notifier

Viewing the List of SNMP Notifiers

GET /api/json/v3/types/snmp-notifier

This command (GET /api/json/v3/types/snmp-notifier) displays the SNMP Notifier.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
duration	The monitor duration in seconds.	No
Interval	The monitor interval in seconds.	No

Example request

```
GET /api/json/v3/types/snmp-notifier HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "snmp-notifier": [
    {
      "href": "https://vxms-xbrickdr919/api/json/v3/types/snmp-
notifier/90fa003e2c944a26974103032ac49089",
      "name": "snmp_notifier"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdr919/api/json/v3/types/snmp-
notifier/",
      "rel": "self"
    }
  ]
}
```


Viewing the Details of an SNMP Notifier

GET /api/json/v3/types/snmp-notifier/<parameter (snmp-notifier-guid or snmp-notifier-index or ?name=snmp-notifier-name)>

This command (GET /api/json/v3/types/snmp-notifier/<parameter [snmp-notifier-guid or snmp-notifier-index or ?name= snmp-notifier-name]>) displays the details of the SNMP Notifier.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
snmp-notifier-guid	A unique identifier for the SNMP Notifier.	Select one of the following: - snmp-notifier-guid - snmp-notifier-id - snmp-notifier-name
snmp-notifier-id	The index of the SNMP Notifier.	
snmp-notifier-name	The name of the SNMP Notifier.	

Output Parameter	Description
auth-key	This parameter behaves as password (hashed when shown).
auth-protocol	SNMPv3 authentication protocol, which must be set to no_auth if priv_protocol is used
community	SNMP Notifier community
enabled	Indicates whether or not the SNMP Notifier is enabled.
engine-id	Unique Id for XMS SNMP agent, enabling management systems to identify all XtremIO Alerts from a given XMS
guid	A unique identifier for the SNMP Notifier
heartbeat-enabled-state	Indicates whether send heartbeat is enabled or disabled. The default is disabled.
heartbeat-frequency	The frequency in seconds in which an SNMP heartbeat is sent on behalf of each managed cluster
index	SNMP Notifier's account's index number, as defined by the XMS upon its creation (a unique positive number)
name	SNMP Notifier's name

SNMP Notifier

Output Parameter	Description
obj-severity	SNMP Notifier severity, based on severity level of current Alerts (Alerts still uncleared) for this SNMP Notifier Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
port	The SNMP Notifier's port ID
priv-key	SNMPv3 privacy key. This parameter behaves as a password (hashed when shown), with a minimum of eight characters.
priv-protocol	SNMPv3 privacy protocol
recipients	SNMP Notifier recipients
username	Name of the SNMP Notifier User
version	SNMP Notifier version number
xms-id	For the XMS to which this SNMP Notifier belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/snmp-notifier?name=snmp_notifier HTTP/1.1
Host: vxms-xbrick238.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "username": "tech",
    "xms-id": [
      "5e9b962c7d844ab684d5252945792cb7",
      "xms",
      1
    ],
    "heartbeat-frequency": 300,
    "recipients": [],
    "obj-severity": "information",
    "community": "com",
    "engine-id": "5e9b962c7d844ab684d5252945792cb7",
    "priv-key": "xxxxxxx",
    "guid": "7123d9b26fc24545ad49d2c077c15705",
    "port": 10,
    "index": 1,
    "name": "snmp_notifier",
    "auth-key": "xxxxxxx",
    "enabled": false,
    "version": "v2c",
    "auth-protocol": "md5",
    "heartbeat-enabled-state": false,
    "priv-protocol": "des"
  },
  "links": [
    {
      "guid": "7123d9b26fc24545ad49d2c077c15705",
      "href": "https://vxms-xbrickdrml179/api/json/v3/types/snmp-notifier/7123d9b26fc24545ad49d2c077c15705",
      "rel": "self"
    }
  ]
}
```

SNMP Notifier

Modifying an SNMP Notifier

PUT /api/json/v3/types/snmp-notifier/<parameter (snmp-notifier-id or ?name=snmp-notifier-name)>

This command (PUT /api/json/v3/types/snmp-notifier/<parameter [snmp-notifier-id or ?name=snmp-notifier-name]>) enables you to modify the SNMP Notifier.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
snmp-notifier-guid	A unique identifier for the SNMP Notifier.	Select one of the following: • snmp-notifier-guid • snmp-notifier-id • snmp-notifier-name
snmp-notifier-index	The index of the SNMP Notifier.	
snmp-notifier-name	The name of the SNMP Notifier.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
disable	Disable	Select one of the following: • disable • enable
enable	Enable	
add-recipient	Adds one recipient to the list	No
auth-key	SNMP v3 authentication key	No
auth-protocol	SNMP v3 authentication protocol	No
community	SNMP community string	No
disable-heartbeat	Disable	No
enable-heartbeat	Enable	No
heartbeat-frequency	The frequency in seconds in which an SNMP heartbeat is sent on behalf of each managed cluster	No

Input Parameter	Description	Mandatory
port	SNMP trap port	No
priv-key	SNMP v3 privilege key	No
priv-protocol	SNMP v3 privilege protocol	No
recipient-list	Recipient list of up to 6 IPs or host names.	No
remove-recipient	Removes one recipient from the list	No
username	SNMP v3 username	No
version	SNMP version	No

Example Request

```
PUT /api/json/v3/types/snmp-notifier/350ea87737994f6ab91785a79b879855 HTTP/1.1
Host: vxms-xbrickdrm788.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"recipient-list":["lgdrm100","lgdrm101"]}
```

Response

Note: The successful completion of this command returns no response.

Storage Controllers

Storage Controllers

Viewing the List of Storage Controllers

GET /api/json/v3/types/storage-controllers

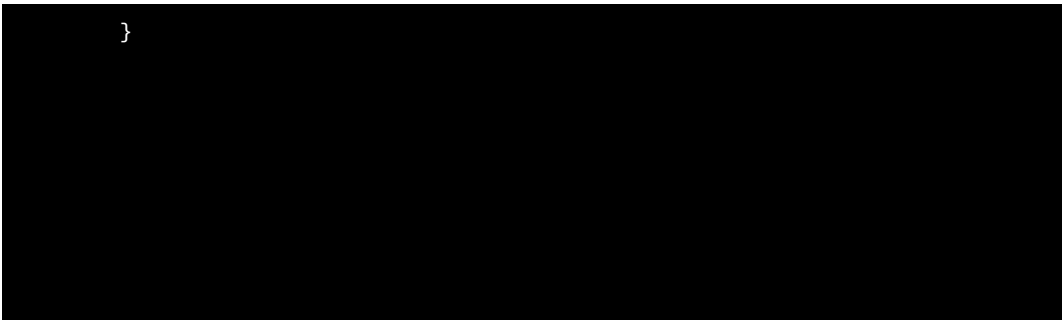
This command (GET /api/json/v3/types/storage-controllers) displays the list of Storage Controllers.

Example request

```
GET /api/json/v3/types/storage-controllers HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "storage-controllers": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controllers/a662e77f21854989be01f4d03eb69bf4",
      "name": "X1-SC1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controllers/82ba09f000df472093b398081dec75a3",
      "name": "X1-SC1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controllers/01c80734d86343cc9c20dd97603b520c",
      "name": "X1-SC2",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controllers/b750d706b37d4ec59d79768acf04ad2b",
      "name": "X1-SC2",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controllers/",
      "rel": "self"
    }
  ]
}
```



Viewing the Details of a Storage Controller

GET /api/json/v3/types/storage-controllers/<parameter (storage-controller-guid or storage-controller-id or ?name= storage-controller-name)>

This command (GET /api/json/v3/types/storage-controllers/<parameter [storage-controller-guid or storage-controller-index or ?name=storage-controller-name)]>) displays details of the selected Storage Controller.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
storage-controller-guid	A unique identifier for the Storage Controller.	Select one of the following: - storage-controller-guid - storage-controller-id - storage-controller-name
storage-controller-index	The index of the Storage Controller.	
storage-controller - name	The name of the Storage Controller.	

Storage Controllers

Input Parameter	Description	Mandatory
- cluster-index OR - cluster-name	The Cluster index or name of the Storage Controller.	- No – for single cluster configurations or if storage-controller-guid is specified - Yes – for multiple cluster configurations and if the storage-controller-guid is not specified

Output Parameter	Description
bmc-status-amber-led	Indicates the BMC amber LED status. Values: - blinking – the LED is blinking - off – the LED is off - on – the LED is on - na – either the LED is not supported or no support for reading the LED is available
bmc-status-green-led	Indicates the BMC green LED status. Values: - blinking – the LED is blinking - off – the LED is off - on – the LED is on - na – either the LED is not supported or no support for reading the LED is available
dimm-correctable-errors-last-day	The number of DIMM ECC correctable errors during the last 24 hours.
dimm-corr-errors-th1	For the dimm_correctable_errors_threshold1, the threshold at which the health state of the DIMM is raised if the number of correctable DIMM errors over the last 24 hours exceeds dimm_correctable_errors_threshold1
dimm-corr-errors-th2	For the dimm_correctable_errors_threshold2, the threshold at which the health state of the DIMM is raised if the number of correctable DIMM errors over the last 24 hours exceeds dimm_correctable_errors_threshold2
guid	A unique identifier for the Storage Controller.

Storage Controllers

Output Parameter	Description
hardware-label	The hardware label as it appears on the physical Storage Controller.
hw-model	The hardware model.
ib1-excessive-buffer- overrun-errors	The Storage Controller's InfiniBand Port 1 number of buffer overruns exceeding the threshold since the collection.
ib1-last-24h-number- of-port-faults	The Storage Controller's InfiniBand Port 1 number of times in the last 24 hours a port was set to the health level of level_5_major, indicating a severe problem is detected.
ib1-last-24h-number- of-port-problems	The Storage Controller's InfiniBand Port 1 number of times in the last 24 hours a port was set to the health level of level_5_major, indicating a severe problem is detected.
ib1-port-hardware- label	The Storage Controller's InfiniBand Port 1 hardware label on the physical component Storage Controller's InfiniBand Port 1.
ib1-port-health-state	The Storage Controller's InfiniBand Port 1 health state. Values • Healthy – (Enable_state = enabled) AND (health_level = level_1_clear OR health_level = level_2_known) AND (port_state is UP). • Failed – (Enable_state = system_disabled OR Enable_state = user_disabled) OR (port_state = down). • Degraded – All other state combinations.
ib2-excessive-buffer- overrun-errors	The Storage Controller's InfiniBand Port 2 number of buffer overruns exceeding the threshold since the collection.
ib2-last-24h-number- of-port-faults	The Storage Controller's InfiniBand Port 2 number of times in the last 24 hours a port was set to the health level of level_5_major, indicating a severe problem is detected.
ib2-last-24h-number- of-port-problems	The Storage Controller's InfiniBand Port 2 number of times in the last 24 hours a port was set to the health level of level_5_major, indicating a severe problem is detected.
ib2-port-hardware- label	The Storage Controller's InfiniBand Port 2 hardware label on the physical component Storage Controller's InfiniBand Port 1.
ib2-port-health-state	The Storage Controller's InfiniBand Port 2 health state. Values • Healthy – (Enable_state = enabled) AND (health_level = level_1_clear OR health_level = level_2_known) AND (port_state is UP). • Failed – (Enable_state = system_disabled OR Enable_state = user_disabled) OR (port_state = down). • Degraded – All other state combinations.
ipmi-bmc-hw-revision	The IPMI BMC hardware revision.

Storage Controllers

Output Parameter	Description
ipmi-bmc-model	The hardware Model of the IPMI BMC.
kdump-daemon-state	Indicates whether the kdump daemon failed. Values: - healthy – kdump daemon reported no error - failed – kdump daemon failed
local-disk-controller-fw-version	The firmware version of the local disk controller
local-disk-controller-hw-revision	The hardware Revision of the LocalDisk controller.
local-disk-controller-model	The local disk controller Model name.
node-name	The name of the node object.
node-sw-build	The node software build for the version of the XtermApp software.
pci-10ge-hba-model	The hardware model name of the iSCSI HBA.
pci-disk-controller-hw-revision	The hardware revision of the localdisk controller.
pci-ib-hba-hw-revision	The hardware revision of the IB HBA Card.
pci-ib-hba-model	The model name of the IB HBA Card.
ports	The Storage Controller's ports.
sas1-last-24h-number-of-phy-problems	The number of Storage Controller's SAS Port 1 physical problems in the last 24 hours.
sas1-port-hardware-label	The Storage Controller's SAS Port 1 hardware label on the physical component Storage Controller's SAS Port 1.
sas1-port-health-state	The Storage Controller's SAS Port 1 health state. Values - Healthy – (Enable_state = enabled) AND (health_level = level_1_clear OR health_level = level_2_known) AND (port_state is UP). - Failed – (Enable_state = system_disabled OR Enable_state = user_disabled) OR (port_state = down). - Degraded – All other state combinations.
sas2-last-24h-number-of-phy-problems	The number of Storage Controller's SAS Port 2 physical problems in the last 24 hours.
sas2-port-hardware-label	The Storage Controller's SAS Port 2 hardware label on the physical component Storage Controller's SAS Port 1.

Storage Controllers

Output Parameter	Description
sas2-port-health-state	The Storage Controller's SAS Port 2 hardware label on the physical component Storage Controller's SAS Port 2.
sc-start-timestamp	The Storage Controller's SAS Port 2 health state. Values - Healthy – (Enable_state = enabled) AND (health_level = level_1_clear OR health_level = level_2_known) AND (port_state is UP). - Failed – (Enable_state = system_disabled OR Enable_state = user_disabled) OR (port_state = down). - Degraded – All other state combinations.
total-memory-in-use	The total memory in use.
acc-dimm-correctable-errors	The accumulated number of DIMM ECC correctable errors since the node was formed. This is a persistent counter.
active-ipmi-port	Indicates which port is currently used for IPMI.
backend-storage-controller-state	Backend Storage Controller's state
bios-fw-version	Storage Controller's BIOS firmware version
brick-id	For the X-Brick to which this Storage Controller belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
current-health-state	Storage Controller's health state Values: - level_1_clear – Healthy, sensor in valid range. - level_2_unknown - The sensor cannot be read or the value cannot be determined for any other reason. - level_3_warning - Least severe detected problem. - level_4_minior - Detected problem. At least some functionality is possible. - level_5_major - Severe detected problem. Used for a single component failure. - level_6_critical - Most severe detected problem.
dae-row-controller-discovery-needed	Indicates the Storage Controller detects a new, unknown DAE Row Controller (iSIM). For X2 clusters only. Values: - True – A new, unknown DAE Row Controller (iSIM) is detected. - False – No new, unknown DAE Row Controller (iSIM) is detected.

Storage Controllers

Output Parameter	Description
dedicated-ipmi-link-conn-state	Represents the state of the link between the dedicated IPMI port and the other Storage Controller. Note: For X1 clusters, the IPMI port is eth3. For X2 clusters, the IPMI port is a USB port. Values: - ok - No connection problems were detected. - invalid_wiring - The port connection wiring is not valid. - disconnected - There is no connection. - wrong_usb_port - The cable is connected to the incorrect USB port. (For X2 clusters only).
dedicated-ipmi-port-mac-addr	The MAC address of the dedicated IPMI port.
dedicated-ipmi-port-speed	Negotiated speed of the dedicated IPMI port Values: 10mb 100mb 1gb 10gb - unknown
dedicated-ipmi-port-state	State of the dedicated Ethernet port (e.g. eth3) used for IPMI access instead of IPMI using the main Ethernet management port. Indicates the physical connection only. Does not relate to IP addressing and routing issues. Values: - up - Port is physically connected. - down - Port is physically disconnected. - unknown - Port state cannot be determined. This is also used when the active_ipmi_port value is not dedicated.
dimmm-correctable-errors	Count of a DIMM error-correcting code (ECC) correctable errors
dimmm-health-state	Reflects the health state of the DIMM. Values: - level_1_clear - Healthy - Sensor is in valid range. - level_2_unknown - The sensor cannot be read or the value cannot be determined for any other reason. - level_5_major - DIMM errors are excessive.

Storage Controllers

Output Parameter	Description
dimmm-uce-occured	Indicates a DIMM uncorrectable error occurred. Values: - false – an uncorrectable error did not occurred - true – an uncorrectable error did occur
enabled-state	Indicates whether the Storage Controller is currently enabled or disabled, either by user or the cluster. Values: - enabled - The object is currently enabled. If the health_state is healthy, this object is active. - user_disabled - The user disabled this object. Disabled and requires manual user activation. - system_disabled - The cluster deactivated this object. Disabled and requires manual user activation when conditions causing deactivation no longer exist.
fan-health-state	Indicates the health state of the least healthy fan sensor_types, based on both analog and discrete sensors.
fc-hba-fw-version	Fibre Channel host bus adaptors firmware version
fc-hba-hw-revision	Detected Fibre Channel host bus adaptors hardware revision
fc-hba-model	Fibre Channel host bus adaptors hardware model
fru-lifecycle-state	Storage Controller's FRU state, using the generic FRU transition states Values: - healthy - The FRU is functional (although may not be fully functional) and diagnosed as healthy. - failed - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. - disconnected - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. - uninitialized - An FRU that has not been initialized passes through this state before initialization. - initializing - Indicates a transient state in which the system performs initialization of a component.
fw-version-error	This parameter is used to indicate if the firmware or OS upgrade has failed or is in the process of upgrading. This reflects the aggregate of all Storage Controller OS and firmware upgrades.
ib1-link-downed	Number of times this InfiniBand port was declared as down
ib1-link-error-recoveries	Number of times this InfiniBand port successfully completed a link error recovery procedure
ib1-link-health-level	Denotes the most severe problem detected over this InfiniBand link.

Storage Controllers

Output Parameter	Description
ib1-link-rate-in-gbps	InfiniBand1 link rate
ib1-local-link-integrity-errors	Number of times this InfiniBand port had logical link integrity errors
ib1-peer-oid	The object index number of the specific peer object connected to this Storage Controller
ib2-peer-oid	
ib1-port-enabled-state	The admin state of the IB1 port. This property is set to <code>system_disabled</code> if too many InfiniBand Switch errors occur. The default value is enabled. Values: - enabled - user_disabled
ib1-port-in-peer-index	Index of the port within the Storage Controller this port is connected to (0 if the port is unconnected). The value is meaningful only when <code>port-peer-type</code> is not none.
ib1-port-misconnection	Indicates if a problem exists in port 1 of the Storage Controller's InfiniBand port connections. Values: - healthy - Connection of the Storage Controller's InfiniBand ports is OK. - not_node - Storage Controller's InfiniBand port is connected to something other than a Storage Controller (for single X-Bricks). - wrong_port - Storage Controller's InfiniBand port is connected to incorrect Storage Controller InfiniBand port in the peer Storage Controller.
ib1-port-peer-type	Defines whether port 1 is connected to a Storage Controller, another switch, or is disconnected.
ib1-port-rcv-errors	Number of packets received on this InfiniBand port with errors
ib1-port-rcv-remote-physical-errors	Number of remote physical errors this InfiniBand port encountered
ib1-port-state	Storage Controller's InfiniBand port 1 state Values: - up - Port is connected and can run traffic. - down - Port is disconnected. - unknown - Port state is unknown.
ib1-symbol-errors	Total number of symbol errors on this InfiniBand port
ib2-link-downed	Number of times this InfiniBand port was declared as down

Storage Controllers

Output Parameter	Description
ib2-link-error-recoveries	Number of times this InfiniBand port successfully completed a link error recovery procedure
ib2-link-health-level	Denotes the most severe problem detected over this InfiniBand link.
ib2-link-rate-in-gbps	Storage Controller InfiniBand link rate for port 2 Values: - unknown - sdr - single data rate, 2.5Gb/s - ddr - double data rate, 5 Gb/s - qdr - quad data rate, 10 Gb/s - fdr - fourteen data rate, 14.0625 Gb/s - fdr10 - ~10.31 Gb/s
ib2-local-link-integrity-errors	Number of times this InfiniBand port had logical link integrity errors
ib2-port-enabled-state	The admin state of the IB2 port. This property is set to <code>system_disabled</code> if too many InfiniBand Switch errors occur. The default value is <code>enabled</code> . Values: - enabled - user_disabled
ib2-port-in-peer-index	Port index within the Storage Controller this port is connected to (should be 0 if the port is unconnected). The value is meaningful only when <code>port_peer_type</code> is not none.
ib2-port-misconnection	Indicates whether a connection problem exists between Storage Controllers in InfiniBand port 2. Values: - healthy - Connection of the Storage Controller's InfiniBand ports is OK. - not_node - Storage Controller's InfiniBand port is connected to something other than a Storage Controller (for single X-Bricks). - wrong_port - Storage Controller's InfiniBand port is connected to incorrect Storage Controller InfiniBand port in the peer Storage Controller.
ib2-port-peer-type	Defines whether port 2 is connected to a Storage Controller, another switch, or to nothing.
ib2-port-rcv-errors	Number of packets received on this InfiniBand port with errors
ib2-port-rcv-remote-physical-errors	Number of remote physical errors this InfiniBand port encountered

Storage Controllers

Output Parameter	Description
ib2-port-state	Storage Controller's InfiniBand port 2 state Values: - up - Port is connected and can run traffic. - down - Port is disconnected. - unknown - Port state is unknown.
ib2-symbol-errors	Total number of symbol errors on this InfiniBand port
ib-addr1	Storage Controller's internal backend InfiniBand addresses for port 1
ib-addr2	Storage Controller's internal backend InfiniBand addresses for port 2
ib-switches-dn	Cluster has detected new InfiniBand Switches.
ib-switch-psu-dn	Cluster has detected a new InfiniBand power supply unit.
identify-led	Indicates whether the identification LED is illuminated for this Storage Controller. The property value is reflected in the GUI LED icon. Note: There is no identification LED in the current PSU. Values: - off - Identification LED is turned off. - blinking - Identification LED is blinking. - on - Identification LED is turned on. - na - This LED or reading of its value is not supported in the hardware.
index	Storage Controller's index number as defined by the XMS upon its creation (a unique positive number)
index-in-brick	The BBU's index within the X-Brick, either 1 or 2. Always 1 for multiple X-Brick clusters (for all X-Bricks), but two BBUs are available for a single X-Brick cluster.
internal-sensor-health-state	Reflects health state of the least healthy of all temperature/voltage/fan/current/internal sensor_types. Value is based on both the analog and discrete sensors of each type. Values: - level_1_clear - Healthy - Sensor is in valid range. - level_2_unknown - Sensor cannot be read or the value cannot be determined for any other reason. - level_3_warning - Least severe detected problem. - level_4_minor - Detected problem. At least some functionality is possible. - level_5_major - Severe detected problem. Used for a single component failure. - level_6_critical - Most severe detected problem.
ipmi-addr	IPMI address and subnet for this Storage Controller

Storage Controllers

Output Parameter	Description
ipmi-bmc-fw-version	Array element of the accepted firmware version
ipmi-conn-error-reason	Reason reported for the disconnection from the Storage Controller's intelligent platform management interface (IPMI) Values: - no_route_to_host - There is no routing or destination is not reachable. - connection_reset_by_peer - TCP connection reset by the IPMI. - connection_refused - TCP connection refused by the IPMI.
iscsi-daemon-state	Indicates the current iSCSI daemon state. Values: - healthy - iSCSI daemon reported no error. - failed - iSCSI daemon failed.
is-sym-node	Indicates if this Storage Controller is the Storage Controller running the SYM. For all X-Bricks other than the first X-Brick, the value is always no.
jbod-dn	DAE discovery needed. Cluster has detected a new DAE.
jbod-lcc-discovery-needed	Cluster has detected a new DAE Controller (LCC).
jbod-psu-dn	DAE power supply unit discovery needed. Cluster has detected a new DAE power supply unit.
journal-state	Defines Storage Controller's journal health state regarding failover and failback.
local-disk-dn	Cluster has detected a new Local Disk Storage.
local-disk-list	Storage Controller's number of Local Disk Storage
low-ram-level	Storage Controller's 'RAM Level Low' indicator (represented by the true value)
mgmt-gw-ip	The IPMI default gateway's IP management
mgmt-link-health-level	Storage Controller's management port health state
mgmt-port-autoneg	Indicates if auto-negotiation is enabled (default) or disabled
mgmt-port-duplex	Ethernet port duplex. The current port configuration applies if the port is full duplex or half duplex. Values: - full - half

Storage Controllers

Output Parameter	Description
mgmt-port-speed	The Management port's port speed Values: 10mb 100mb 1gb 10gb
mgmt-port-state	Storage Controller's management port state Values: - up - Port is physically connected. - down - Port is physically disconnected. - unknown - Port state cannot be determined.
monitored-ups-list	BBU monitored by this Storage Controller
name	Storage Controller's unique name, as defined by the XMS upon its creation
node-csid	Internal Storage Controller naming index number
node-fp-temperature-state	Indicates the temperature sensor reading for above normal temperatures. Failover is triggered at high threshold. Values: - normal - Whenever the temperature level is below <code>sc_fp_temperature_high_warning_threshold</code> - warning - Whenever the temperature level is between <code>sc_fp_temperature_high_warning_threshold</code> AND <code>sc_fp_temperature_high_critical_threshold</code> - high - Whenever the temperature level is above <code>sc_fp_temperature_high_critical_threshold</code> - invalid - Whenever PM fails to read the sensor for five consecutive attempts (reading every 30 seconds), or five consecutive readings are out of the expected temperature range
node-guid	GUID (Globally Unique Identifier) hardwired in the physical Storage Controller. Once it is installed, it never changes.

Output Parameter	Description
node-health-state	Reflects the overall health state of the Storage Controller and its contained components. Values: healthy - The Storage Controller and its contained FRUs (all local_disk and node_psu) are all ok: fru_lifecycle_state is healthy enabled_state is enabled and All XEnv's xenv_state are active and All module's mdl_state are active. - Also the Storage Controller node_journaling_health_state is healthy. partial_fault - Not performance affecting, but some fault exists, calculated as: - The Storage Controller, XEnv and module conditions are the same as for healthy state. - One of the following: - Storage Controller state of node_journaling_health_state is not healthy. - or - At least one local_disk.fru_lifecycle_state is not healthy or local_disk.enabled_state is not enabled. - or - At least one node_psu.fru_lifecycle_state is not healthy or node_psu.enabled_state is not enabled. degraded – Condition(s) exist(s) that affect(s) performance calculated as: - Some of the contained components are not OK, calculated as follows: - At least one XEnv xenv_state not active. - or - At least one module mdl_state is not active. - All other conditions are the same as for healthy or partially_degraded. failed – Storage Controller's fru_lifecycle_state is not healthy or Storage Controller's enabled_state is not enabled.
node-id	For the node to which this Storage Controller belongs, a tuple array containing the following parameters (in the following order): the node's object GUID identifier, the node name, and the node index.
node-index	Storage Controller's physical index within the X-Brick (lower-most one is number 1)

Storage Controllers

Output Parameter	Description
node-journaling-health-state	Defines the health state of the journaling component, where in any state other than healthy Values: • healthy - Journal function is healthy and in use. • ready - Journal function is not in use, yet is potentially analyzed as working, due to a technician decision not to use the journal. • fault - Journal function has a fault on this Storage Controller, as there is a chance of losing the journal upon a power loss. • dumping - Journal is in the process of dumping itself.
node-mgr-addr	IP addresses used to access the Storage Controller manager
node-mgr-addr-subnet	Storage Controller's subnet mask management IP
node-mgr-conn-error-reason	Reason for the last disconnection between the XMS and the Storage Controller
node-mgr-conn-state	Connection state between XMS and Storage Controller manager (clustering agent) Values: • disconnected - XMS is disconnected from the Storage Controller manager. The Storage Controller manager connection error reason parameter describes the reason for the disconnection. • connected - XMS is connected to the Storage Controller manager. • unknown - Used by the XMS when one poll fails, until three consecutive polls fail. • controlled_disconnect - XMS is disconnected from the Storage Controller manager in an expected manner. The Storage Controller manager connection error reason parameter describes the reason for the disconnection. This is the state while the Storage Controller state is shutdown or booting.
node-psu-dn	Storage Controller power supply unit discovery needed. Cluster has detected a new Storage Controller power supply unit.
node-psu-list	Storage Controller's number of Storage Controller PSU (power supply unit) objects and list of their object IDs. There are two PSUs per Storage Controller.
node-stop-reason	Reason reported for Storage Controller stoppage

Storage Controllers

Output Parameter	Description
node-stop-type	Describes the nature of the current/last Storage Controller stop. Values: • none - The Storage Controller is not stopped or stopping. Set when the Storage Controller re-enters the active state. • dae_stopped - The Storage Controller was orderly stopped as part of an orderly cluster stop. • stopped - The Storage Controller was stopped unorderedly. • failed_stop - An unorderedly stop failed in an unrecoverable way. • dae_stopping - The Storage Controller is in the process of an orderly stop. Note: If an orderly stop transforms into an unorderedly stop, the value of this parameter changes accordingly. • stopping - The Storage Controller is in the process of an unorderedly stop. Note: If an orderly stop transforms into an unorderedly one, the value of this parameter is changed accordingly. • replaced - The Storage Controller is in the stopped state due to Storage Controller replacement process being performed.
num-of-local-disks	Storage Controller's total number of Local Disks
num-of-monitored-upses	Number of BBUs that are connected to the Storage Controller
num-of-node-psus	Storage Controller's number of Storage Controller PSU objects and the list of their object IDs. There should be two PSUs per Storage Controller.
num-of-ssds	Total number of SSDs in this Storage Controller's X-Brick
obj-severity	Storage Controller's severity, based on severity level of current Alerts (Alerts still uncleared) for this Storage Controller and its contained objects Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
os-upgrade-current-step	The current step number reached during an operating system upgrade

Storage Controllers

Output Parameter	Description
os-upgrade-current-step-info	Displays a text representation of the os_upgrade for a defined Storage Controller. A value of "None" means that no os_upgrade is taking place.
os-version	Storage Controller operating system version, equivalent to the firmware for other components
part-number	Dell EMC-assigned string identifying part (SKU), independent of the actual vendor model_name used for this FRU
pci-10ge-hba-fw-version	iSCSI host bus adaptors firmware version
pci-10ge-hba-hw-revision	iSCSI bus adaptors hardware hardware revision
pci-disk-controller-fw-version	DAE Controller's (LCC) firmware version
pci-ib-hba-fw-version	InfiniBand host bus adaptors freeware revision
remote-journal-health-state	Defines the health state of the remote journal.
rg-id	For the DPG associated with this Storage Controller, a tuple array containing the following parameters (in the following order): the DPG's object GUID identifier, the DPG name, and the DPG index..
sas1-hba-port-health-level	Storage Controller's SAS port number 1 health level Values: - level_1_clear - Healthy – SAS port is healthy. - level_2_unknown - The port health cannot be read or their values cannot be determined for any other reason. - level_3_warning - Least severe detected problem. - level_4_minor - Detected problem. At least some functionality is possible. - level_5_major - Severe detected problem. - level_6_critical - Most severe detected problem.
sas1-port-enabled-state	The admin state of the SAS1 port. This property is set to system_disabled if too many SAS errors occur. The default value is enabled. Values: - enabled - user_disabled
sas1-port-rate	Rate of the first serial attached SCSI (SAS) port used
sas1-port-state	State of the first serial attached SCSI (SAS) port used

Storage Controllers

Output Parameter	Description
sas2-hba-port-health-level	Storage Controller's SAS port number 2 health level Values: - level_1_clear - Healthy – SAS port is healthy. - level_2_unknown - The port health cannot be read or their values cannot be determined for any other reason. - level_3_warning - Least severe detected problem. - level_4_minior - Detected problem. At least some functionality is possible. - level_5_major - Severe detected problem. - level_6_critical - Most severe detected problem.
sas2-port-enabled-state	The admin state of the SAS2 port. This property is set to system_disabled if too many SAS errors occur. The default value is enabled. Values: - enabled - user_disabled
sas2-port-rate	Rate of the second serial attached SCSI (SAS) port used Values: 12gbps 6gbps 3gbps - unknown
sas2-port-state	Status of the serial attached SCSI (SAS) port 2
sc-start-timestamp-display	Storage Controller's start-time
serial-number	Storage Controller's serial number
ssd-dn	Cluster has detected a new SSD.
status-led	LED state indicating Storage Controller object faults
sw-version	Storage Controller software version. This should be identical to the cluster's software version, unless it is undergoing special process (e.g. upgrade).
sym-start-timestamp	The time (in UTC) the SYS module was stated.
sys-id	For the cluster to which this Storage Controller belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.

Storage Controllers

Output Parameter	Description
tag-list	The list of Storage Controller Tags
targets-dn	The cluster has detected new Target(s).
temperature-health-state	Reflects health state of the least healthy temperature sensor_types, based on both the analog and discrete sensors.
upgrade-failure-reason	Shows the permanent error of the last upgrade attempts. It is blank when the last attempt has been successful, or if no pervious upgrade command was given, or if an upgrade is currently in progress. Values: • All failure options of test validity • Failed to prepare system • Failed to stop service • Upgrade was rolled back • Emergency: system is down
upgrade-state	The state of the last upgrade process for this Storage Controller
ups-discovery-needed	Sets BBU discovery.
voltage-health-state	Reflects the aggregated health state of the voltage sensors. Values: • level_1_clear - Healthy - Diagnostic is in valid range. • level_2_unknown - The sensor cannot be read or the value cannot be determined for any other reason. • level_3_warning - Least severe detected problem. • level_4_minor - Detected problem. At least some functionality is possible. • level_5_major - Severe detected problem. Used for a single component failure. • level_6_critical - Most severe detected problem.
xms-id	For the XMS to which this Storage Controller belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/storage-controllers/953c29f0d39449de8732531e3786b02c
HTTP/1.1
Host: vxms-xbrickdrm1650.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Storage Controllers

Response

```
{
  "content": {
    "ib2-link-error-recoveries": 0,
    "fru-lifecycle-state": "healthy",
    "node-guid": "001e67f38d5100000000000000000000",
    "obj-severity": "information",
    "dimm-health-state": "level_1_clear",
    "ib2-last-24h-number-of-port-problems": 0,
    "local-disk-controller-fw-version": "",
    "num-of-monitored-upses": 0,
    "rg-id": [
      "56b6ee0de8b44a44ae1349eedbe02be0",
      "X1-DPG-1",
      1
    ],
    "dimm-corr-errors-th2": 2500,
    "jbod-dn": "false",
    "ib1-port-in-peer-index": 1,
    "bios-fw-version": "SE5C610.86B.01.01.3021.C1.051020171131",
    "ib2-link-rate-in-gbps": "fdr",
    "ib2-symbol-errors": 0,
    "ib1-port-health-state": "healthy",
    "ib1-link-downed": 0,
    "sas1-port-rate": "12gbps",
    "fc-hba-model": "Emulex",
    "ib2-port-state": "up",
    "brick-name": "X1",
    "node-csid": 8,
    "os-upgrade-current-step-info": null,
    "ib1-last-24h-number-of-port-faults": 0,
    "sas1-port-health-state": "healthy",
    "sas1-port-state": "up",
    "node-fp-temperature-state": "normal",
    "tag-list": [],
    "pci-disk-controller-hw-revision": null,
    "ib-addr1": "169.254.0.1",
    "ib2-port-rcv-errors": 0,
    "node-sw-build": "99",
    "acc-dimm-correctable-errors": 44,
    "ib2-port-in-peer-index": 2,
    "node-health-state": "healthy",
    "node-mgr-conn-state": "connected",
    "ib-switches-dn": "false",
    "name": "X1-SC1",
    "local-disk-controller-hw-revision": null,
    "ib1-port-enabled-state": "enabled",
    "brick-id": [
      "ca80264aa582463eb71245f7f7a379dc",
      "X1",
      1
    ],
    "status-led": "na",
    "enabled-state": "enabled",
    "ib2-port-misconnection": "healthy",
  }
}
```

```
"is-sym-node": true,
"sas2-hba-port-health-level": "level_1_clear",
"fc-hba-hw-revision": "11.1.238.23",
"ups-discovery-needed": false,
"ports": [
  [
    1,
    56,
    "up",
    [],
    "StorageController",
    1,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0
  ],
  [
    2,
    56,
    "up",
    [],
    "StorageController",
    2,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0,
    0
  ]
],
"mgmt-port-speed": "1gb",
"sas1-hba-port-health-level": "level_1_clear",
"ib1-port-state": "up",
"bmc-status-amber-led": "blinking",
"ipmi-conn-error-reason": null,
"ib1-link-error-recoveries": 0,
"dimm-corr-errors-th1": 500,
"ipmi-bmc-fw-version": "1.48",
"sas1-port-enabled-state": "enabled",
"sc-start-timestamp": 1527537812,
"sc-start-timestamp-display": "Mon May 28 23:03:32 2018",
"index": 1,
"ib1-last-24h-number-of-port-problems": 0,
```

Storage Controllers

```

"current-health-state": "level_1_clear",
"upgrade-failure-reason": "",
"pci-ib-hba-model": null,
"sas1-port-hardware-label": "SAS1",
"journal-state": "healthy",
"temperature-health-state": "level_1_clear",
"xms-id": [
  "a2c662880cb34f1b96eb180fc6695aee",
  "xms",
  1
],
"node-psu-dn": "false",
"ib2-link-health-level": "level_1_clear",
"ib1-port-rcv-remote-physical-errors": 0,
"num-of-ssds": 18,
"ssd-dn": 1,
"dae-row-controller-discovery-needed": false,
"node-stop-reason": "none",
"ib1-peer-oid": "7c2d52656e656e2048616c6c616b2d7c",
"ib2-peer-oid": "7c2d52656e656e2048616c6c616b2d7c",
"pci-10ge-hba-hw-revision": null,
"os-upgrade-current-step": 0,
"mgmt-gw-ip": "10.139.128.1",
"node-journaling-health-state": "healthy",
"node-mgr-addr": "10.139.129.66",
"low-ram-level": "0",
"sas2-port-state": "up",
"ib2-port-rcv-remote-physical-errors": 0,
"backend-storage-controller-state": "normal",
"ib2-local-link-integrity-errors": 0,
"internal-sensor-health-state": "level_1_clear",
"ib1-port-rcv-errors": 0,
"active-ipmi-port": "dedicated",
"bmc-status-green-led": "off",
"remote-journal-health-state": "healthy",
"ipmi-bmc-hw-revision": null,
"dimm-uce-occured": "false",
"mgmt-port-autoneg": "enable",
"serial-number": "FC6XI152000028",
"sas2-port-hardware-label": "SAS2",
"guid": "953c29f0d39449de8732531e3786b02c",
"ib1-excessive-buffer-overflow-errors": 0,
"mgmt-port-duplex": "full",
"ib2-port-enabled-state": "enabled",
"fc-hba-fw-version": "11.1.238.22",
"fw-version-error": "no_error",
"ib2-port-health-state": "healthy",
"dimm-correctable-errors": 38,
"ib1-link-rate-in-gbps": "fdr",
"ib2-last-24h-number-of-port-faults": 0,
"identify-led": "off",
"ib1-port-hardware-label": "IB1",
"sas2-port-health-state": "healthy",
"ib2-excessive-buffer-overflow-errors": 0,
"sym-start-timestamp": 1526306160,
"pci-10ge-hba-fw-version": "11.1.238.1",
"pci-10ge-hba-model": null,

```

```

"ib1-link-health-level": "level_1_clear",
"monitored-ups-list": [],
"node-mgr-conn-error-reason": "none",
"os-version": "Xtremio OS release 6.1.0-96_X2",
"fan-health-state": "level_1_clear",
"num-of-local-disks": 3,
"sys-name": "xbrickdrm1650",
"node-psu-list": [
  [
    "a707b4f5e4154003bd18cb2fd0586fd6",
    "X1-SC1-PSU-L",
    1
  ],
  [
    "ab7dad8674b1494aaa910ee10118ffff",
    "X1-SC1-PSU-R",
    2
  ]
],
"part-number": "100-586-040-03",
"sys-id": [
  "8c7222ee6f38459a9b5b6982cef03b8a",
  "xbrickdrm1650",
  1
],
"ib1-port-misconnection": "healthy",
"ib2-port-peer-type": "node",
"upgrade-state": "no_upgrade_done",
"dedicated-ipmi-port-speed": "16b",
"sas2-port-rate": "12gbps",
"pci-disk-controller-fw-version": "12.35.0",
"sas2-port-enabled-state": "enabled",
"ib2-link-downed": 0,
"mgmt-port-state": "up",
"voltage-health-state": "level_1_clear",
"targets-dn": 0,
"kdump-daemon-state": "healthy",
"pci-ib-hba-hw-revision": "0",
"jbod-lcc-discovery-needed": false,
"sys-index": 1,
"ib1-symbol-errors": 0,
"ib-switch-psu-dn": 0,
"dedicated-ipmi-port-state": "up",
"ib1-local-link-integrity-errors": 0,
"ipmi-bmc-model": null,
"index-in-brick": 1,
"hardware-label": "X1-SC1",
"sas2-last-24h-number-of-phy-problems": 0,
"local-disk-controller-model": null,
"dimm-correctable-errors-last-day": 0,
"sw-version": "6.1.0",
"iscsi-daemon-state": "healthy",
"ib1-port-peer-type": "node",
"ipmi-addr": "obsolete",
"dedicated-ipmi-port-mac-addr": "00e04c68023c",
"node-stop-type": "none",
"ib2-port-hardware-label": "IB2",
"ib-addr2": "169.254.0.2",
"local-disk-dn": "false",

```

Storage Controllers

```

"sas1-last-24h-number-of-phy-problems": 0,
"local-disk-list": [
  [
    "941835d7ee8c45b7ac651ee0f07c9ac4",
    "X1-SC1-LocalDisk1",
    1
  ],
  [
    "75c5a34da7274e2bbb9792c7a55007f7",
    "X1-SC1-LocalDisk3",
    2
  ],
  [
    "695b271c24504315991b915f7fda7135",
    "X1-SC1-LocalDisk4",
    3
  ]
],
"num-of-node-psus": 2,
"hw-model": "S2600WTT",
"node-name": "X1-SC1",
"node-index": 1,
"jbod-psu-dn": "false",
"dedicated-ipmi-link-conn-state": "ok",
"node-mgr-addr-subnet": "10.139.129.66/21",
"mgmt-link-health-level": "level_1_clear",
"pci-ib-hba-fw-version": "2.36.5000",
"node-id": [
  "953c29f0d39449de8732531e3786b02c",
  "X1-SC1",
  1
],
"brick-index": 1
},
"links": [
  {
    "guid": "953c29f0d39449de8732531e3786b02c",
    "href": "https://vxms-xbrickdrm1650/api/json/v3/types/storage-
controllers/953c29f0d39449de8732531e3786b02c",
    "rel": "self"
  }
]
}

```

Storage Controller PSUs

Viewing the List of Storage Controller PSUs

GET /api/json/v3/types/storage-controller-psus

This command (GET /api/json/v3/types/storage-controller-psus) displays the list of Storage Controller PSUs.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

```
GET /api/json/v3/types/storage-controller-psus HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Storage Controller PSUs

Response

```
{
  "storage-controller-psus": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controller-psus/c571cdacf54044e5b378734e4340e207",
      "name": "X1-SC1-PSU-L",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controller-psus/76b211e25f044342868eee66cb0abc88",
      "name": "X1-SC1-PSU-L",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controller-psus/f12011204d7f404c8d23b362977c2ae2",
      "name": "X1-SC1-PSU-R",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controller-psus/5b0f2250081f4194a32898fd7e10e694",
      "name": "X1-SC1-PSU-R",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controller-psus/091c00c4fd824a9fa62c2ed4f2eb54ae",
      "name": "X1-SC2-PSU-L",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controller-psus/090f92809d5b443fabe71934f3f13f9c",
      "name": "X1-SC2-PSU-L",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controller-psus/3f596f2fcfbd44aeaeb7188efa1b8427",
      "name": "X1-SC2-PSU-R",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-controller-psus/11cd4d3243d44a948f2c93af9c92942e",
      "name": "X1-SC2-PSU-R",
      "sys-name": "xbrick224-rename"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/storage-"
    }
  ]
}
```


Storage Controller PSUs

```
controller-psus/",  
    "rel": "self"  
  }  
  ]  
}
```

Storage Controller PSUs

Viewing the Details of a Storage Controller PSU

GET /api/json/v3/types/storage-controller-psus/<parameter (storage-controller-psu-guid or storage-controller-psu-index or ?name=storage-controller-psu-name)>

This command (GET /api/json/v3/types/storage-controller-psus/<parameter [storage-controller-psu-guid or storage-controller-psu-index or ?name=storage-controller-psu-name]>) displays the details of the selected Storage Controller PSU.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
storage-controller-psu-guid	A unique identifier for the Storage Controller PSU.	Select one of the following: - storage-controller-psu-guid - storage-controller-psu-index - storage-controller-psu-name
storage-controller-psu-index	The index of the Storage Controller PSU.	
storage-controller-psu-name	The name of the Storage Controller PSU.	
- cluster-index OR - cluster-name	The Cluster index or name of the Storage Controller PSU.	- No – for single cluster configurations or if storage-controller-psu-guid is specified - Yes – for multiple cluster configurations and if the storage-controller-psu-guid is not specified

Storage Controller PSUs

Output Parameter	Description
brick-id	For the X-Brick to which this Storage Controller PSU belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
enabled-state	Indicates whether the Storage Controller PSU is currently enabled or disabled, either by the user or the cluster.
fru-lifecycle-state	Storage Controller PSU's FRU state, using the generic FRU transition states Values: • healthy - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • failed - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • disconnected - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • uninitialized – Indicates that an FRU that has not been initialized passes through this state before initialization. • initializing – Indicates a transient state in which the system performs initialization of a component.
fru-replace-failure-reason	Reason why the FRU replacement has failed. null means that the last FRU replacement was either not performed for this object or the replacement was successful.
fw-version-error	Firmware version error. Parameter used to indicate if the firmware or OS upgrade has failed or is in the process of upgrading.
guid	The object GUID identifier of the Storage Controller PSU.
hardware-label	The hardware label as it appears on the physical Storage Controller PSU.
hw-revision	Hardware level of the power supply unit
index	Storage Controller PSU's index number as defined by the XMS upon its creation (a unique positive number)
input	The existence of input power to the supply
location	The location of the Storage Controller PSU within its Storage Controller
location-index	The physical location of the component.
model-name	Vendor-assigned Storage Controller PSU's model name

Storage Controller PSUs

Output Parameter	Description
name	Storage Controller PSU's name
node-id	For the node to which this Storage Controller PSU belongs, a tuple array containing the following parameters (in the following order): the node's object GUID identifier, the node name, and the node index.
node-id	For the node to which this Storage Controller PSU belongs, a tuple array containing the following parameters (in the following order): the node's object GUID identifier, the node name, and the node index.
node-index	The physical index of the node within the brick. The bottom node is number 1.
node-name	The name of the node to which this module belongs.
node-psu-id	Storage Controller PSU's object index number
obj-severity	Storage Controller PSU severity, based on severity level of current Alerts (Alerts still uncleared) for this Storage Controller PSU Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
part-number	Dell EMC-assigned string identifying part (SKU), independent of the actual vendor model_name used for this FRU
power-failure	Shows severity pertaining to the nature of a power failure, should one occur
power-feed	Power into PSU typically has two feeds: A and B Typical configuration: • The first InfiniBand Switch PSU is connected to feed_A. • The second InfiniBand Switch PSU is connected to feed_B.
serial-number	Storage Controller PSU's serial number
status-led	LED state, indicating Storage Controller PSU's object faults
sys-id	For the cluster to which this Storage Controller PSU belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.

Output Parameter	Description
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.

Example Request

GET /api/json/v3/types/storage-controller-psus?name=X1-SC1-PSU-L HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Storage Controller PSUs

Response

```
{
  'content':
  {
    'brick-id': ['abee3f9a5aa548fca0ccb6ce20ce079f', 'X1', 1],
    'brick-index': 1,
    'brick-name': 'X1',
    'enabled-state': 'enabled',
    'fru-lifecycle-state': 'healthy',
    'fru-replace-failure-reason': '',
    'fw-version-error': 'no_error',
    'guid': 'c24cf9e785ed48b58d2db9ea41b4c7e6',
    'hardware-label': 'PSU1',
    'hw-revision': '05 ',
    'index': 1,
    'input': 'on',
    'location': 'left',
    'location-index': 1,
    'model-name': 'DPS-750XB A',
    'name': 'X1-SC1-PSU-L',
    'node-id': ['0d1c959a6af547d59f4534ab342f8c34', 'X1-SC1', 1],
    'node-index': 1,
    'node-name': 'X1-SC1',
    'node-psu-id': ['c24cf9e785ed48b58d2db9ea41b4c7e6',
      'X1-SC1-PSU-L',
      1],
    'obj-severity': 'information',
    'part-number': '*** DPS-750XB A',
    'power-failure': 'clear',
    'power-feed': 'PWR-B',
    'serial-number': 'E98791D1513058549',
    'status-led': 'on',
    'sys-id': ['3c0060fe31ec4fd9b014bcf458da0907',
      'xbrickdrm1318',
      1],
    'sys-index': 1,
    'sys-name': 'xbrickdrm1318'
  },
  "links": [
    {
      "guid": "c24cf9e785ed48b58d2db9ea41b4c7e6",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/storage-
controller-psus/c24cf9e785ed48b58d2db9ea41b4c7e6",
      "rel": "self"}
  ]
}
```

SSDs

Viewing the List of SSDs

GET /api/json/v3/types/ssds

This command (GET /api/json/v3/types/ssds) displays the list of SSDs.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

```
GET /api/json/v3/types/ssds HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

SSDs

Response

```
{
  "ssds": [
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/ssds/ca9e25ad56dd4ee6ac7709ec2646a72b",
      "name": "wwn-0x500003970c89f855",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/ssds/76790e9b3f934a26a64f7678d835037c",
      "name": "wwn-0x5000cca04e075130",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/ssds/66db8fa31c9c44eb833eba84cd65ca46",
      "name": "wwn-0x500003970c89e9b9",
      "sys-name": "xbrickdrm1652"
    },
    ...
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/ssds/90f8df2c21eb4534955b5ca8f1678550",
      "name": "wwn-0x5000cca04e0a82c4",
      "sys-name": "xbrick224-rename"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/ssds/",
      "rel": "self"
    }
  ]
}
```


Viewing the Details of an SSD

GET /api/json/v3/types/ssds/<parameter (ssd-guid or ssd-index or ?name= ssd-name)>

This command (GET /api/json/v3/types/ssds/<parameter [ssd-guid or ssd-index or ?name= ssd-name]>) displays the details of the selected SSD.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
ssd-guid	A unique identifier for the SSD.	Select one of the following: - ssd-guid - ssd-index - ssd-name
ssd-index	The index of the SSD.	
ssd-name	The name of the SSD.	
- cluster-index OR - cluster-name	The Cluster index or name of the SSD.	- No – for single cluster configurations or if ssd-guid is specified - Yes – for multiple cluster configurations and if the ssd-guid is not specified

Output Parameter	Description
brick-id	For the X-Brick to which this SSD belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
bw	Total read and write bandwidth in MB per second

SSDs

Output Parameter	Description
certainty	XMS certainty. Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent but the XMS is unable to determine the success of the request. Values: - ok - There is certainty that the XMS is synchronized - add_pending - An add request was made by the XMS but uncertain if it was executed. - modify_pending - A modify request was made by the XMS but uncertain if it was executed. - remove_pending - A remove request was made by the XMS but uncertain if it was executed.
diagnostic-health-state	Reflects the health of the SSD device itself. Values: - level_1_clear - In valid range. - level_2_unknown - Cannot be read or the value cannot be determined for any other reason. - level_3_warning - Least severe problem detected. - level_4_minor - Detected problem. At least some functionality is possible. - level_5_major - Severe problem detected. Used for a single component failure. - level_6_critical - Most severe problem detected.
enabled-state	Indicates whether the SSD is currently enabled or disabled, either by the user or the cluster. Values: - enabled - The object is currently enabled. If the health-state is healthy, this object is active. - user_disabled - The user has disabled this object. It is disabled and requires manually activation by the user. - system_disabled - The system has deactivated this object. It is disabled and must be reactivated by the user when conditions causing the deactivation no longer exist.

Output Parameter	Description
encryption-status	SSD's encryption (Data at Rest) status Values: • <code>enc_disk_status_not_supported</code> - Used for SSDs that do not support Data at Rest encryption and for HDD. • <code>enc_disk_status_unlocked</code> - The SSD supports encryption. However, the SSD is currently not locked. • <code>enc_disk_status_locked</code> - The SSD supports encryption, but the PIN is unknown. • <code>enc_disk_status_locked_cluster_pin</code> - The SSD supports encryption and is locked with the system's PIN. • <code>enc_disk_status_unknown_pin_erasable</code> - The SSD supports encryption and is locked with an unknown, erasable PIN. • <code>enc_disk_status_unknown_pin_non_erasable</code> - The SSD supports encryption and is locked with an unknown, non-erasable PIN.
fru-lifecycle-state	SSD's FRU state, using the generic FRU transition states Values: • <code>healthy</code> - The FRU is functional (although may not be fully functional) and diagnosed as healthy. • <code>failed</code> - The FRU is diagnosed as failed by the system. This includes a failure during the initial system preparation and configuration. • <code>disconnected</code> - As far as the system can tell, no FRU is physically present. This includes the detection of a newly-plugged component with a serial number which is different from that of the previous component in the same location. • <code>uninitialized</code> - An FRU that has not been initialized passes through this state before initialization. • <code>initializing</code> - Indicates a transient state in which the system performs initialization of a component.
fw-version	Current firmware version of the SSD
fw-version-error	Reason for FRU diagnostic failure when a firmware problem exists Values: • <code>invalid_fw_version</code> - The firmware version is invalid and cannot be used. • <code>mismatch_fw_version</code> - The firmware version does not match the target firmware version. It is not optimal, but is usable. • <code>no_error</code> - The firmware version used and the target firmware are the same. • <code>upgrading</code> - The firmware version is in the process of being upgraded. • <code>unknown_model</code> - This FRU model is not supported in this version.

SSDs

Output Parameter	Description
guid	The object GUID identifier of this SSD.
health-state	The SSD's state of health Values: - level_1_clear - Counter is in valid range. - level_2_unknown - The counter cannot be determined. - level_3_warning - Least severe problem detected - level_4_minor - Detected problem. At least some functionality is possible. - level_5_major - Severe problem detected. - level_6_critical - Most severe problem detected.
hw-revision	Hardware level of the power supply unit Note: The value is not always available. GUI and CLI do not display the value when unavailable.
identify-led	Indicates whether the identification LED is illuminated for this SSD. The property value is reflected in the GUI LED icon. Note: There is no identification LED in the current PSU. Values: - off - Identification LED is turned off. - blinking - Identification LED is blinking. - on - Identification LED is turned on. - na - This LED or reading of its value is not supported in the hardware.
index	SSD's index number as defined by the XMS upon its creation (a unique positive number)
io-error-asc	The ASC code of the most recent I/O error (two hex digits)
io-error-ascq	The ASCQ code of the most recent I/O error (two hex digits)
io-error-sense-code	The sense code of an I/O error
io-error-vendor-specific	Vendor-specific information string of the most recent I/O error
iops	SSD's total read and write real-time input/output operations per second
last-io-error-timestamp	Timestamp (UTC) of last recorded I/O error
last-io-error-type	Defines the last I/O error type. Values: - none – SSD is not in replace status. - ssd_error – SSD returned error on I/O. - timeout – I/O timeout, triggered a test for I/O errors.
model-name	Vendor-assigned SSD model name

Output Parameter	Description
name	SSD's name
num-bad-sectors	Number of bad sectors, detected in the SSD
num-die-offline	The number of dies offline (die retirements) within the SSD (NAND flash composed of dies).
obj-severity	SSD's severity, based on severity level of current Alerts (Alerts still uncleared) for this SSD Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
part-number	A string assigned by Dell EMC identifying the part
percent-endurance-remaining	Percentage of SSD endurance remaining
percent-endurance-remaining-level	Event triggerered for any change in this parameter
rd-bw	Total read bandwidth in MB per second
rd-iops	Total read real-time input/output operations per second
rg-id	For the DPG associated with this Storage Controller, a tuple array containing the following parameters (in the following order): the DPG's object GUID identifier, the DPG name, and the DPG index..
rg-index	The Id of the RAID group to which this SSD belongs.
rg-name	The name of the RAID group to which this SSD belongs.
serial-number	SSD's serial number
slot-error-reason	Indicates the additional information if the Slot State is "Error" or "unsupported_disk". Values: • None – The Slot State property is not "Error". • Diagnostic Failed – The diagnostics to validate the Slot State failed. • Link Down – The link to the SSD is down. The SDD cannot be verified. • SSD is too small – The SSD is smaller than the expected size of SSDs for this cluster.

SSDs

Output Parameter	Description
slot-num	Slot index in which SSD currently resides, or Slot index into which the currently-disconnected SSD was previously inserted
slot-state	Indicates the current state/content of the Slot. Values: • Empty – The slot is empty (no disk is inserted). • Resident SSD – An SSD belonging to this XtremApp system. An SSD object is associated with this SSD. This SSD belongs to this X-Brick regardless of its location within the DAE. This object is referenced by the Slot's SSD Object Id property. • Unsupported disk – A disk whose model is not supported is inserted into the Slot. • Uninitialized SSD – The SSD inserted into this slot does not have an XtremApp signature. This SSD is most probably safe to use as a new SSD. XMS normally detects uninitialized disks and converts them to resident SSDs. XMS may also use the Initialize Uninitialized SSD command to convert this type of SSD to a resident SSD. • Foreign XtremApp SSD – The SSD inserted into this slot does have an XtremApp signature, but that signature contains a reference to an SSD object Id that is not defined in the system. This may occur for the following reasons: • The SSD belonged to the system, but was removed and XtremApp could not mark it as removed. • The SSD belongs to a different X-Brick. • The SSD belongs to a different system that is not encrypted. Use caution adding the SSD to the system. Its contents may be lost. XMS will not automatically convert the SSD to a resident SSD. XMS may use the Initialize Foreign SSD command to convert the SSD to a resident SSD. • Error – The state/content of the Slot cannot be determined due to an error. The slot-error-reason property contains the reason.
smart-error-asc	The ASC code of the most recent SMART error (two hex digits)
smart-error-ascq	The ASCQ code of the most recent SMART error (two hex digits)

Output Parameter	Description
ssd-failure-reason	Reasons for SSD failure Values: • none - The SSD's fru_lifecycle_state is healthy. • disconnected - The reason for the SSD failure was its removal from its physical Slot. Note: The value is not cleared when the SSD is re-inserted into its Slot. Value clearance occurs once the SSD health state becomes healthy. • ssd_size_mismatch - The size of the SSD is different from the SSD's ssd, size parameter. • wrong_brick - The SSD is inserted to an X-Brick other than the RG's X-Brick. • ssd_failed_diagnostics - The SSD has failed the diagnostic testing (the value for diagnostic_health_state is level_5_major or level_6_critical errors). • ssd_links_failed - Both SSD ports failed (ssd_link1_error_health_state and ssd_link2_error_health_state have level_5_major or level_6_critical errors).
ssd-id	SSD object's identification
ssd-index	The index of the SSD.
ssd-link1-health-state	• Reflects the SSD health state. • Relates to the ports and connected link of the SSD. • Relates to the first port, which should be connected to Storage Controller-1. Values: • level_1_clear - Healthy - Diagnostic is in valid range. • level_2_unknown - The sensor cannot be read or the value cannot be determined for any other reason. • level_3_warning - Least severe detected problem. • level_4_minor - Detected problem. At least some functionality is possible. • level_5_major - Severe problem detected. Used for a single component failure. • level_6_critical - Most severe problem detected.

SSDs

Output Parameter	Description
ssd-link2-health-state	- Reflects the SSD health state. - Relates to the ports and connected link of the SSD. - Relates to the second port, which should be connected to SC-2. Values: - level_1_clear - Healthy - Diagnostic is in valid range. - level_2_unknown - The sensor cannot be read or the value cannot be determined for any other reason. - level_3_warning - Least severe problem detected. - level_4_minor - Detected problem. At least some functionality is possible. - level_5_major - Severe problem detected. Used for a single component failure. - level_6_critical - Most severe problem detected.
ssd-name	The name of the SSD.
ssd-rg-state	Displays the state of the SSD related to the DPG to which it belongs.
ssd-size	The overall size of the SSD
ssd-size-in-kb	SSD size in KB
ssd-space-in-use	SSD space in use, in KB
ssd-uid	- UID (unique identification) of the SSD that is inserted into the Slot. - Parameter contains a value only if the slot state is: resident_SSD, uninitialized_SSD, or foreign_XtremAPP_SSD. Otherwise it is null
status-led	LED state, indicating SSD object faults
swap-led	Indicates whether a new SSD was inserted to a DAE and the replace procedure should be activated. Values: - off – SSD is not in replace status - blinking – SSD is in replace status
sys-id	For the cluster to which this SSD belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags

Output Parameter	Description
temperature-state	Indicates whether any of DAE sub components (such as SSD, DAE-Controller, or DAE-Row-Controller) have a temperature above normal. Critical/high/invalid temperature states may trigger HA events such as SAS-path failover or stop-cluster. Relies on the worst temperature-state of the DAE's sub components.
useful-ssd-space	The useful size of this specific SSD
wr-bw	Total write bandwidth in MB per second
wr-iops	Total write real-time input/output operations per second
xms-id	For the XMS to which this SSD belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

SSDs

Example Request

```
GET /api/json/v3/types/ssds/f6036094ddd44753af3f82ed21ef0c7d HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "ssd-size": "1875902464",
    "fru-lifecycle-state": "healthy",
    "smart-error-ascq": 0,
    "obj-severity": "information",
    "rd-bw": "0",
    "wr-iops": "0",
    "serial-number": "0x5000cca06c4a2b00",
    "rg-id": [
      "cf1666d28d074737bc93df1b93cefb1c",
      "X1-DPG-1",
      1
    ],
    "guid": "a72a92307b064f718d5891b4e1200833",
    "ssd-id": [
      "a72a92307b064f718d5891b4e1200833",
      "wwn-0x5000cca06c4a2b00",
      18
    ],
    "fw-version-error": "no_error",
    "slot-num": 17,
    "identify-led": "off",
    "io-error-ascq": 0,
    "ssd-size-in-kb": 1875902464,
    "io-error-asc": 0,
    "num-bad-sectors": 0,
    "percent-endurance-remaining-level": "ok",
    "io-error-vendor-specific": 0,
    "tag-list": [],
    "ssd-uid": "wwn-0x5000cca06c4a2b00",
    "sys-name": "xbrickdrm1179",
    "part-number": "118033272",
    "sys-id": [
      "ed59e939575c48a2bb25554b08732430",
      "xbrickdrm1179",
      1
    ],
    "iops": "0",
    "brick-name": "X1",
    "name": "wwn-0x5000cca06c4a2b00",
    "brick-id": [
      "f67e336d91eb4ad48618f92e7d26752d",
      "X1",
      1
    ],
  ],
}
```

```

    "hw-revision": "",
    "status-led": "off",
    "enabled-state": "enabled",
    "encryption-status": "enc_supported_locked_cluster_pin",
    "model-name": "HGST      HUSMR119CLAR1920",
    "useful-ssd-space": "1875902464",
    "ssd-failure-reason": "none",
    "percent-endurance-remaining": 100,
    "num-die-offline": 0,
    "sys-index": 1,
    "slot-state": "resident_ssd",
    "health-state": null,
    "ssd-link1-health-state": "level_1_clear",
    "last-io-error-type": "none",
    "ssd-space-in-use": "126016430",
    "last-io-error-timestamp": 0,
    "ssd-index": 18,
    "ssd-name": "wwn-0x5000cca06c4a2b00",
    "ssd-link2-health-state": "level_1_clear",
    "xms-id": [
      "5e9b962c7d844ab684d5252945792cb7",
      "xms",
      1
    ],
    "index": 18,
    "rg-name": "X1-DPG-1",
    "io-error-sense-code": 0,
    "bw": "0",
    "fw-version": "C1T6",
    "temperature-state": "normal",
    "swap-led": "off",
    "rg-index": 1,
    "diagnostic-health-state": "level_1_clear",
    "certainty": "ok",
    "slot-error-reason": "none",
    "ssd-rg-state": "in_rg",
    "smart-error-asc": 0,
    "rd-iops": "0",
    "wr-bw": "0",
    "brick-index": 1
  },
  "links": [
    {
      "guid": "a72a92307b064f718d5891b4e1200833",
      "href": "https://vxms-
xbrickdrm1179/api/json/v3/types/ssds/a72a92307b064f718d5891b4e1200833",
      "rel": "self"
    }
  ]
}

```

SYSLOG Notifier

Viewing the List of SYSLOG Notifiers

GET /api/json/v3/types/syslog-notifier

This command (GET /api/json/v3/types/syslog-notifier) displays the SYSLOG Notifier.

Example request

```
GET /api/json/v3/types/syslog-notifier HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "syslog-notifier": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/syslog-
notifier/912252403b6a4070811a98ab014faa48",
      "name": "syslog_notifier"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/syslog-
notifier/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of a SYSLOG Notifier

GET /api/json/v3/types/syslog-notifier/<parameter (syslog-notifier-guid or syslog-notifier-index or ?syslog-notifier-name)>

This command (GET /api/json/v3/types/syslog-notifier/<parameter [syslog-notifier-guid or syslog-notifier-index or ?syslog-notifier-name]>) displays the details of the SYSLOG Notifier.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
syslog-notifier-guid	A unique identifier for the SYSLOG Notifier.	Select one of the following: - syslog-notifier-guid - syslog-notifier-id - syslog-notifier-name
syslog-notifier-id	The index of the SYSLOG Notifier.	
syslog-notifier-name	The name of the SYSLOG Notifier.	

Output Parameter	Description
enabled	Indicates whether or not the SYSLOG Notifier is enabled.
index	SYSLOG Notifier's account index number, as defined by the XMS upon its creation (a unique positive number)
name	SYSLOG Notifier's name
obj-severity	SYSLOG Notifier severity, based on severity level of current Alerts (Alerts still uncleared) for this SNMP Notifier and its contained objects Values: - clear - No Alerts exist for this entity. - information - The highest severity for this entity and all contained objects is information. - minor - The highest severity for this entity and all contained objects is minor. - major - The highest severity for this entity and all contained objects is major. - critical - The highest severity for this entity and all contained objects is critical.
targets	The list of Targets for this SYSLOG Notifier

SYSLOG Notifier

Output Parameter	Description
xms-id	For the XMS to which this SYSLOG Notifier belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/syslog-notifier/912252403b6a4070811a98ab014faa48
HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "index": 1,
    "xms-id": [
      "36b0474eca4240cca658740c198d0faf",
      "xms",
      1
    ],
    "name": "syslog_notifier",
    "obj-severity": "information",
    "guid": "56cf8efe96c6435eae9d53f617ac2352",
    "enabled": true,
    "targets": [
      "lgdrml00:514",
      "lgdrml01:514",
      "lgdrml02:514"
    ]
  },
  "links": [
    {
      "guid": "56cf8efe96c6435eae9d53f617ac2352",
      "href": "https://vxms-xbrickdrml648/api/json/v3/types/syslog-notifier/56cf8efe96c6435eae9d53f617ac2352",
      "rel": "self"
    }
  ]
}
```

SYSLOG Notifier

Modifying a SYSLOG Notifier

PUT /api/json/v3/types/syslog-notifier/<parameter (syslog-notifier-guid or syslog-notifier-index or ?syslog-notifier-name)>

This command (PUT /api/json/v3/types/syslog-notifier/<parameter [syslog-notifier-guid or syslog-notifier-index or ?syslog-notifier-name]>) enables you to modify the SYSLOG Notifier.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
syslog-notifier-guid	A unique identifier for the SYSLOG Notifier.	Select one of the following: - syslog-notifier-guid - syslog-notifier-id - syslog-notifier-name
syslog-notifier-id	The index of the SYSLOG Notifier.	
syslog-notifier-name	The name of the SYSLOG Notifier.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
disable	Disable	Select one of the following: - disable - enable - targets
enable	When enabling the SYSLOG Notifier, the Target's property must contain at least one address.	
targets	List of SYSLOG Targets with optional port. Required when enabling.	

Example Request

```
PUT /api/json/v3/types/syslog-notifier/56cf8efe96c6435eae9d53f617ac2352
HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"enable": "true", "targets": ["lgdrm100", "lgdrm101", "lgdrm102"]}
```

Response

Note: The successful completion of this command returns no response.

Tags

Tags

Viewing the List of Tags

GET /api/json/v3/types/tags

This command (GET /api/json/v3/types/tags) displays the list of Tags.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

GET /api/json/v3/types/tags HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/tags/",
      "rel": "self"
    }
  ],
  "tags": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/tags/a30cae7bcb534c128f691b4c3432704f",
      "name": "/Volume"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/tags/d168195339c04800930204f8d30e5169",
      "name": "/InitiatorGroup"
    }
  ]
}
```

```

        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/a68d77073a7348b292e11e14e2c198f1",
        "name": "/Volume/tag1"
    },
    {
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/58c0656c5bcc469eb097d89f2b97e48e",
        "name": "/ConsistencyGroup"
    },
    {
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/c6a95e6fae31433881287bbb061ec159",
        "name": "/ConsistencyGroup/tag2"
    },
    {
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/546e8ee02a1a41f895eed42b9b905ddf",
        "name": "/Volume/Squeeze"
    },
    {
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/7b93d140619047a68ef6c4120ca1069f",
        "name": "/Volume/ps"
    },
    {
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/71a792ff25d94ecd900a6aae690f94a9",
        "name": "/Volume/tag3"
    },
    {
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/fdd60a062279445b90ab8cf96dec3390",
        "name": "/Volume/tag4"
    },
    {
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/ef07996a52734d8fadda75d5e62b6990",
        "name": "/Volume/tag2"
    },
    {
        "href": "https://vxms-
xbrickdrm919/api/json/v3/types/tags/e83648d64d4b4504947c9e9f958156ff",
        "name": "/Volume/Bosmat DRR"
    }
]
}

```

Tags

Viewing the Details of a Tag

GET /api/json/v3/types/tags/<parameter (tag-guid or tag-index or ?name=tag-name)>

This command (GET /api/json/v3/types/tags/<parameter [tag-guid or tag-index or ?name=tag-name]>) displays the details of the selected Tag.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
tag-guid	A unique identifier for the Tag.	Select one of the following: • tag-guid • tag-index • tag-name
tag-index	The index of the Tag.	
tag-name	The name of the Tag.	

Output Parameter	Description
caption	Tag's caption
child-list	List of Tags' child objects
color	Background color of a Tag. Default value is no background color, which is represented by the value <code>null</code>
creation-time-long	The creation time of the Tag.
direct-list	The list of Volume objects (object IDs) directly assigned to this Tag
guid	The object GUID identifier of the Tag.
index	Tag's index number as defined by the XMS upon its creation (a unique positive number)
name	Tag's name as defined by the user
num-of-children	Tag's number of children objects
num-of-direct-objs	The number of IG objects that are directly tagged by this Tag, and a list of their object IDs
num-of-items	The number of objects to which this Tag was added.
object-type	The object type on which the Tag occurred
obj-list	List of objects in the report

Output Parameter	Description
obj-severity	Tag severity, based on severity level of current Alerts (Alerts still uncleared) for this Tag and its contained objects Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
parent-id	Id of the parent Tag object
sys-id	For the cluster to which this Tag belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
xms-id	For the XMS to which this Tag belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Tags

Example Request

```
GET /api/json/v3/types/tags/3bc4800014746c082200edf912597de HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "object-type": "SSD",
    "xms-id": [
      "5e9b962c7d844ab684d5252945792cb7",
      "xms",
      1
    ],
    "child-list": [],
    "color": "red",
    "obj-severity": "information",
    "sys-index": "",
    "sys-name": "",
    "num-of-children": 0,
    "caption": "tagtest1",
    "sys-id": [],
    "direct-list": [],
    "index": 111,
    "guid": "3bc48800014746c082200edf912597de",
    "name": "/SSD/tagtest1",
    "parent-id": [
      "be465ab71dd04d15a1e41b2e14a70287",
      "/SSD",
      109
    ],
    "num-of-direct-objs": 0,
    "obj-list": [],
    "creation-time-long": "1535028914000",
    "num-of-items": 0
  },
  "links": [
    {
      "guid": "3bc48800014746c082200edf912597de",
      "href": "https://vxms-xbrickdrml179/api/json/v3/types/tags/3bc48800014746c082200edf912597de",
      "rel": "self"
    }
  ]
}
```

Creating a Tag

POST /api/json/v3/types/tags

This command (POST /api/json/v3/types/tags) enables you to create a Tag.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
entity	The entity type associated (InfinibandSwitch, DAE, Initiator, BatteryBackupUnit, Scheduler, StorageController, DataProtectionGroup, X-Brick, Volume, Cluster, InitiatorGroup, SSD, SnapshotSet, ConsistencyGroup, Target)	Yes
tag-name	Full path Tag name	Yes
color	The background color of the Tag in the XMS web interface. The default is no background color using the value non-colored.	No

Example

POST /api/json/v3/types/tags HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

```
{"entity": "Volume", "tag-name": "Tw.Tag.01"}
```

Response

```
{
  "links": [
    {
      "guid": "53025964b57548e581a1f62988d62735",
      "href": "https://vxms-xbrickdrml648/api/json/v3/types/tags/53025964b57548e581a1f62988d62735",
      "rel": "self"
    }
  ]
}
```

Tags

Modifying a Tag

PUT /api/json/v3/types/tags/<parameter (tag-guid or tag-index or ?name=tag-name)>

This command (PUT /api/json/v3/types/tags/<parameter [tag-guid or tag-index or ?name=tag-name]>) enables you to modify the selected Tag, including renaming the Tag.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
tag-guid	A unique identifier for the Tag.	Select one of the following: • tag-guid • tag-index • tag-name
tag-index	The index of the Tag.	
tag-name	The name of the Tag.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
caption	New Tag name	Yes
tag-id	The Id of the tag object to be added to the object to be tagged.	Yes
color	The background color of the tag in XMS GUI. The default value is no background color.	No

Example Request

```
PUT /api/json/v3/types/tags/35566ad3278c4169ba3d74fdb171dc78 HTTP/1.1
Host: vxms-xbrick279.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"tag-id":7,"caption":"temp.test"}
```

Response

Note: The successful completion of this command returns no response.

Tagging Objects

PUT /api/json/v3/commands/tags/tag-object/

This command (PUT /api/json/v3/commands/tags/tag-object) enables you to tag an object.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
entity	The type of object to be tagged	Yes
entity-details	The unique identifier of the object to be tagged.	Yes
tag-id	The unique identifier of the tag object to be added to the object to be tagged.	Yes
cluster-id	The Id of the Cluster object to which the object to tag belongs.	No

Example Request

```
PUT /api/json/v3/commands/tags/tag-object HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"tag-id":["0b6355d1e24d43b5b6b6cf106d550053"],"entity":"Volume","entity-
details":["61ef99db693a4d70b9ce639022662cb0"]}
```

Response

Note: The successful completion of this command returns no response.

Tags

Untagging Objects

PUT /api/json/v3/commands/tags/untag-object

This command (PUT /api/json/v3/commands/tags/untag-object) enables you to untag an object.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
entity	The type of object to be tagged	Yes
entity-details	The unique identifier of the object to be tagged.	Yes
tag-id	The Id of the tag object to be added to the object to be tagged.	Yes
sys-id	The Id of the Cluster object to which the object to tag belongs.	No

Example Request

```
PUT /api/json/v3/commands/tags/untag-object HTTP/1.1
Host: vxms-xbrick279.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"tag-id":["0b6355d1e24d43b5b6b6cf106d550053"],"entity":"Volume","entity-
details":["61ef99db693a4d70b9ce639022662cb0"]}
```

Response

Note: The successful completion of this command returns no response.

Removing a Tag

DELETE /api/json/v3/types/tags/<parameter (tag-guid or tag-index or ?name=tag-name)>

This command (DELETE /api/json/v3/types/tags/<parameter [tag-guid or tag-index or ?name=tag-name]>) enables you to delete a Tag.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
tag-guid	A unique identifier for the Tag.	Select one of the following: - tag-guid - tag-index - tag-name
tag-index	The index of the Tag.	
tag-name	The name of the Tag.	

Example Request

DELETE /api/json/v3/types/tags/53025964b57548e581a1f62988d62735 HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

Note: The successful completion of this command returns no response.

Targets

Targets

Viewing the List of Targets

GET /api/json/v3/types/targets

This command (GET /api/json/v3/types/targets) displays the list of all Targets and their parameters.

Example request

```
GET /api/json/v3/types/targets HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "targets": [
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/targets/e374cf48b95b4ddb913dd3527a642a88",
      "name": "X1-SC1-fc1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/targets/07e07a2fedf444d7b5c16590be8d4334",
      "name": "X1-SC1-target1-rename",
      "sys-name": "xbrickdrml652"
    },
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/targets/3cb4069a435244d7838175e0f73bc327",
      "name": "X1-SC1-target2",
      "sys-name": "xbrickdrml652"
    },
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/targets/a2c092f1833f49609479dc7471da0e56",
      "name": "X1-SC1-fc2",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/targets/27882e68911b4ac28b74eb1fe4c15567",
      "name": "X1-SC1-target3",
      "sys-name": "xbrickdrml652"
    }
  ],
}
```

Targets

```

    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/b1ef75c727ce4c31ac517e8e25b44fe6",
      "name": "X1-SC1-iscsi1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/85c444841a7b4fbca438ed2250e70808",
      "name": "X1-SC1-iscsi2",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/0f1284089ed645d492ecd3f22ed40ad7",
      "name": "X1-SC1-target4",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/513994b1da1446e58e19e1c82d054ed5",
      "name": "X1-SC2-fc1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/845aa5cf834b48b89a21a262ac32d7f2",
      "name": "X1-SC1-target5",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/ece56e125cb54448a69bb2d534b98035",
      "name": "X1-SC2-target1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/44d11ce8a4684b7fb23f6b231cd0425d",
      "name": "X1-SC2-fc2",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/8999853cd7c649f4a2d70b098d580a0c",
      "name": "X1-SC2-iscsi1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/dc7df86dc8cd4117816d1aa3c80e78b6",
      "name": "X1-SC2-target2",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/028482627a86445abeacfd303a5073bd",
      "name": "X1-SC2-iscsi2",
      "sys-name": "xbrick224-rename"
    }
  ]
}

```

Targets

```

    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/5fd309e7f026463b9b9bc65e56ec11ed",
      "name": "X1-SC2-target3",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/b2b7c9c7f46246f1973437bc1487023c",
      "name": "X1-SC2-target4",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/targets/e670b8d163b74420978eae9f3b6b6bba",
      "name": "X1-SC2-target5",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/targets/",
      "rel": "self"
    }
  ]
}

```

Viewing the Details of a Target

GET /api/json/v3/types/targets/<parameter (target-guid or target-index or ?name= target-name)>

This command (GET /api/json/v3/types/targets/<parameter [target-guid or target-index or ?name= target-name]>) displays details of the selected Target.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
target-guid	A unique identifier for the Target.	Select one of the following: - target-guid - target-index - target-name
target-index	The index of the Target.	
target-name	The name of the Target.	
- cluster-index OR - cluster-name	The Cluster index or name of the Target.	- No – for single cluster configurations or if target-guid is specified - Yes – for multiple cluster configurations and if the target-guid is not specified

Output Parameter	Description
acc-num-of-rd	Total accumulative number of read operations having occurred during the Target's lifespan
acc-num-of-small-rd	Accumulated number small reads input/output operations for the Target
acc-num-of-small-wr	Accumulated number of small writes input/output operations recursively held by this Target
acc-num-of-unaligned-rd	Accumulated number of unaligned reads for input/output operations recursively contained by this Target
acc-num-of-unaligned-wr	Accumulated number of unaligned writes for input/output operations recursively contained by this Target
acc-num-of-wr	Accumulative number of write operations having occurred during the Target's lifespan

Targets

Output Parameter	Description
acc-size-of-rd	Accumulative capacity KB size of read operations having occurred during the Target's lifespan
acc-size-of-wr	Accumulative capacity KB size of write operations having occurred during the Target's lifespan
avg-latency	Real-time average latency of read and write operations, measured in μ s
brick-id	For the X-Brick to which this Target belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
bw	Total read and write bandwidth in MB per second
certainty	Indicates confidence that the XMS and the cluster are synchronized. Value changes from OK if a request is sent but the XMS is unable to determine the success of the request.
driver-version	Driver version of the Target object
eth-kbytes-rx	The total Kbytes received. Relevant for iSCSI only.
eth-kbytes-tx	The total number of Kbytes transmitted. Relevant for iSCSI only.
eth-pkt-rx	The number of Ethernet packets received. Relevant for iSCSI only.
eth-pkt-rx-crc-error	The number of Ethernet frames received with CRC error (and thus dropped). Relevant for iSCSI only.
eth-pkt-rx-no-buffer-error	The number of Ethernet packets that failed to be received due to lack of buffer space. Relevant for iSCSI only.
eth-pkt-tx	The number of Ethernet packets transmitted. Relevant for iSCSI only.
eth-pkt-tx-error	The number of packets that failed to be transmitted due to error. Relevant for iSCSI only.
fc-dumped-frames	The Fibre Channel ports' diagnostic counter for dumped frames. Impacts the port-health-level.
fc-invalid-crc-count	The Fibre Channel ports' diagnostic counter for invalid CRC count. Impacts the port-health-level.
fc-link-failure-count	The Fibre Channel ports' diagnostic counter for failure count. Impacts the port-health-level.
fc-loss-of-signal-count	The Fibre Channel ports' diagnostic counter for loss of signal count. Impacts the port-health-level.
fc-loss-of-sync-count	The Fibre Channel ports' diagnostic counter for loss of synchronized count. Impacts the port-health-level.
fc-prim-seq-prot-err-count	The Fibre Channel ports' diagnostic counter for primary sequential protocol error count. Impacts the port-health-level.

Targets

Output Parameter	Description
fc-seq-retx-req-count	The Fibre Channel ports' diagnostic counter for sequential retransmission request count. Values impact the port-health-level.
fw-version	Current firmware version of the Target
guid	The object GUID identifier of the Target.
hardware-label	The hardware label as it appears on the physical Target.
index	Target's index number as defined by the XMS upon its creation (a unique positive number)
iops	Target's total read and write real-time input/output operations per second
jumbo-enabled	Determines whether jumbo frames are supported for this Target. The default value is false.
mtu	Maximum valid values for maximum transmission unit sizes are 1500 when non-jumbo frames are enabled and 9216 when jumbo frames are enabled for iSCSI Targets. Applicable for iSCSI and eth_replication only.
name	Target's name as defined by the XMS when creating the Target
node-id	For the node to which this Target belongs, a tuple array containing the following parameters (in the following order): the node's object GUID identifier, the node name, and the node index.
node-index	The physical index of the node within the brick. The bottom node is number 1.
node-name	The name of the node to which this module belongs.
obj-severity	Target's severity, based on severity level of current Alerts (Alerts still uncleared) for this Target Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.

Targets

Output Parameter	Description
port-address	The following input format variations are accepted for Fibre Channel Initiators ("X" is a hexadecimal digit – upper case or lower case are allowed): • "XX:XX:XX:XX:XX:XX:XX" • "XXXXXXXXXXXXXXXXXX" • "0XXXXXXXXXXXXXXXXXX" When the Initiator object port_address parameter is queried, the value is always returned in a single output format. IQN and EUI formats are allowed for iSCSI Initiators.
portal-list	• List of all portals (VLAN, IP and Port) associated with the Target. • Relevant only for iSCSI ports. • List is null for Fibre Channel ports. • For iSCSI ports, when empty, the port does not accept iSCSI traffic. • When the cluster is initialized, the list shows no Targets (there are no non-empty default values to eliminate IP conflict risks). • Implementation forces a limit upon the maximum number of Target portals. • XMS and managed clusters enforce the uniqueness of all the exposed IP addresses.
port-enabled-state	The admin state of the Target port. This property is set to system_disabled if too many errors occur. The default value is enabled. Values: • enabled • user_disabled
port-health-level	Target health level • When any of the port's diagnostic properties show an unexpected value (i.e. a counter is non-0 or if the port is removed from the system) • The highest severity for all properties that contribute to port health level Note: Since any non-zero value is an error, no mechanism is used to indicate the threshold, or which counter is out of range.
port-index	• The port number for both Fibre Channel and iSCSI. • Value is either 1 or 2. • Assigned by discovery.
port-mac-addr	MAC address of this target port (relevant for iSCSI Targets only)
port-speed	The negotiated speed of the port (some applicable for Ethernet and some for Fibre Channel)
port-state	State of the Target port (Fibre Channel or iSCSI)

Output Parameter	Description
port-target-capability	The capability of the Target port. Values: - fc - iscsi_or_eth_replication - eth_or_eth_replication
port-type	Port type (Fibre Channel or iSCSI) and port's address
rd-bw	Total read bandwidth in MB per second
rd-iops	Total read real-time input/output operations per second
rd-latency	Real-time average latency of read operations, measured in μ s
relative-target-port	Indicates the relative Target port.
small-bw	Current bandwidth of small input/output operations, addressed at the Target
small-iops	Current IOPS of small input/output operations per second, addressed at the Initiator Group
small-rd-bw	Current bandwidth of small input/output operations, addressed at the Target
small-rd-iops	Current IOPS of small read input/output operations per second, addressed at the Target
small-wr-bw	Current bandwidth of small write input/output operations, addressed at the Target
small-wr-iops	Current IOPS of small write input/output operations per second, addressed at the Target
sys-id	For the cluster to which this Target belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags
tar-error-reason	Failure type causing the Target's target_health_state not to be clear
tar-id	For this Target, a tuple array containing the following parameters (in the following order): the Target's object GUID identifier, the Target name, and the Target index.
tg-id	For the Target Group to which this Target belongs, a tuple array containing the following parameters (in the following order): the Target Group's object GUID identifier, the Target Group name, and the Target Group index.

Targets

Output Parameter	Description
tg-index	The Target Group's index number.
tg-name	The Target Group's name.
unaligned-bw	Current bandwidth of unaligned input/output operations, addressed at the Target
unaligned-iops	Current IOPS of unaligned input/output operations per second, addressed at the Target
unaligned-rd-bw	Current bandwidth of unaligned input/output operations, addressed at the Target
unaligned-rd-iops	Current IOPS of unaligned read input/output operations per second, addressed at the Target
unaligned-wr-bw	Current bandwidth of unaligned write input/output operation, addressed at the Target
unaligned-wr-iops	Current IOPS of unaligned write input/output operations per second, addressed at the Target
wr-bw	Total write bandwidth in MB per second
wr-iops	Total write real-time input/output operations per second
wr-latency	Real-time average latency of write operations, measured in μ s
xms-id	For the XMS to which this Target belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/targets/9044e35139a54baa904f1c6af8506748 HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "small-iops": "0",
    "port-mac-addr": "a4bf010012c7",
    "port-target-capability": null,
    "obj-severity": "information",
    "rd-bw": "0",
    "unaligned-rd-bw": "0",
    "driver-version": "",
    "fc-dumped-frames": 0,
    "iops": "0",
    "port-type": "eth_replication",
```

```

"acc-num-of-small-wr": "0",
"guid": "9044e35139a54baa904f1c6af8506748",
"fc-loss-of-signal-count": 0,
"acc-num-of-rd": "0",
"tar-error-reason": "none",
"port-address": "a4:bf:01:00:12:c7",
"port-health-level": "level_1_clear",
"eth-pkt-rx-crc-error": 0,
"eth-pkt-tx": 0,
"acc-size-of-wr": "0",
"port-speed": "10Gb",
"unaligned-rd-iops": "0",
"eth-kbytes-tx": 0,
"avg-latency": "0",
"wr-latency": "0",
"eth-pkt-rx-no-buffer-error": 0,
"acc-num-of-unaligned-rd": "0",
"tag-list": [],
"sys-name": "xbrickdrm1179",
"wr-iops": "0",
"sys-id": [
  "ed59e939575c48a2bb25554b08732430",
  "xbrickdrm1179",
  1
],
"fc-prim-seq-prot-err-count": 0,
"name": "X1-SC2-target5",
"brick-id": [
  "f67e336d91eb4ad48618f92e7d26752d",
  "X1",
  1
],
"acc-num-of-unaligned-wr": "0",
"acc-num-of-wr": "0",
"mtu": 1500,
"acc-size-of-rd": "0",
"unaligned-wr-bw": "0",
"fc-link-failure-count": 0,
"small-rd-bw": "0",
"port-state": "down",
"tg-index": "",
"sys-index": 1,
"eth-pkt-rx": 0,
"portal-list": [],
"port-enabled-state": "enabled",
"fc-invalid-crc-count": 0,
"index": 10,
"hardware-label": "Port5",
"fc-loss-of-sync-count": 0,
"acc-num-of-small-rd": "0",
"eth-kbytes-rx": 0,
"xms-id": [
  "5e9b962c7d844ab684d5252945792cb7",
  "xms",
  1
],
"small-wr-bw": "0",
"eth-pkt-tx-error": 0,
"unaligned-iops": "0",

```

Targets

```

    "unaligned-bw": "0",
    "small-rd-iops": "0",
    "jumbo-enabled": false,
    "tg-id": [],
    "node-index": 2,
    "tar-id": [
      "9044e35139a54baa904f1c6af8506748",
      "X1-SC2-target5",
      10
    ],
    "relative-target-port": 19,
    "small-wr-iops": "0",
    "fc-seq-retx-req-count": 0,
    "rd-latency": "0",
    "node-name": "X1-SC2",
    "certainty": "ok",
    "unaligned-wr-iops": "0",
    "bw": "0",
    "port-index": 5,
    "fw-version": "",
    "rd-iops": "0",
    "wr-bw": "0",
    "node-id": [
      "3a1b956d025940f598944da321026f81",
      "X1-SC2",
      2
    ],
    "small-bw": "0"
  },
  "links": [
    {
      "guid": "9044e35139a54baa904f1c6af8506748",
      "href": "https://vxms-
xbrickdrm1179/api/json/v3/types/targets/9044e35139a54baa904f1c6af8506748",
      "rel": "self"
    }
  ]
}

```

Modifying a Target

PUT /api/json/v3/types/targets/<parameter (target-guid or target-index or ?name= target-name)>

This command (PUT /api/json/v3/types/targets/<parameter [target-guid or target-index or ?name= target-name]>) enables you to modify a Target.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
target-guid	A unique identifier for the Target.	Select one of the following:
target-index	The index of the Target.	
target-name	The name of the Target.	
- cluster-index - OR - cluster-name	The Cluster index or name of the Target.	- No – for single cluster configurations or if target-guid is specified - Yes – for multiple cluster configurations and if the target-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
tar-id	Target's name or the index number	Yes
mtu	Maximum valid values for maximum transmission unit sizes are 1500 when non-jumbo frames are enabled and 9216 when jumbo frames are enabled for iSCSI Targets. Applicable for iSCSI and eth_replication only.	No

Targets

Input Parameter	Description	Mandatory
port-enabled-state	The admin state of the Target port. This property is set to system_disabled if too many errors occur. The default value is enabled. Values: - enabled - user_disabled	No
port-type	Use to change the port-type to or from replication. Values: - unknown - fc - iscsi - eth_replication	No
refresh-replication-password	The refresh replication password.	No
sys-id	For the cluster to which this Target belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. May be omitted if only one cluster is defined.	No

Note: A cluster can also be defined as `cluster -name` or `cluster -index` in the URL, however the cluster definition should only be entered in one location, either the URL or the body.

Example Request

```
PUT /api/json/v3/types/targets/b5f350fb5fc24e0687a158468cb12155 HTTP/1.1
Host: vxms-xbrick238.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"mtu": "1500"}
```

Response

Note: The successful completion of this command returns no response.

Modifying a Target Refresh Replication Password

PUT /api/json/v3/commands/targets/modify-refresh-replication-password/<parameter (target-guid or target-index or ?name= target-name)>

This command (PUT /api/json/v3/commands/targets/modify-refresh-replication-password/<parameter [target-guid or target-index or ?name= target-name]>) enables you to refresh a Target’s remote protection password.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
target-guid	A unique identifier for the Target.	Select one of the following: - target-guid - target-index - target-name
target-index	The index of the Target.	
target-name	The name of the Target.	
- cluster-index OR - cluster-name	The Cluster index or name of the Target.	- No – for single cluster configurations or if target-guid is specified - Yes – for multiple cluster configurations and if the target-guid is not specified

Targets

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
mtu	Maximum valid values for maximum transmission unit sizes are 1500 when non-jumbo frames are enabled and 9216 when jumbo frames are enabled for iSCSI Targets. Applicable for iSCSI and eth_replication only.	No
port-enabled-state	The admin state of the Target port. This property is set to system_disabled if too many errors occur. The default value is enabled. Values: - enabled - user_disabled	
port-type	Use to change the port-type to or from replication. Values: - unknown - fc - iscsi - eth_replication	No
refresh-replication-password	The remote protection password for the Target.	No
sys-id	The index number of the cluster this Target belongs to. May be omitted if only one cluster is defined.	No

Note: A cluster can also be defined as `cluster - name` or `cluster - index` in the URL, however the cluster definition should only be entered in one location, either the URL or the body.

Example Request

```
PUT /api/json/v3/commands/targets/modify-refresh-replication-  
password/30b3f427a019456e9cdd3ef4df63e251 HTTP/1.1  
Host: vxms-xbrick1648.xiodrm.lab.emc.com  
Authorization: Basic *****  
Cache-Control: no-cache
```

```
{"mtu": "1500"}
```

Response

Note: The successful completion of this command returns no response.

Target Groups

Target Groups

Viewing the List of Target Groups

GET /api/json/v3/types/target-groups

This command (GET /api/json/v3/types/target-groups) displays the list of Target Groups.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

```
GET /api/json/v3/types/target-groups HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "target-groups": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/target-
groups/4d60dc769dc64e9090ea46ed49d24c0b",
      "name": "Default",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/target-
groups/737808f44e20422599b41e5413eb74fa",
      "name": "Default",
      "sys-name": "xbrick224-rename"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/target-
groups/",
      "rel": "self"
    }
  ]
}
```

Target Groups

Viewing the Details of a Target Group

GET /api/json/v3/types/target-groups/<parameter (tg-guid or tg-index or ?name= tg-name)>

This command (GET /api/json/v3/types/target-groups/<parameter [tg-guid or tg-index or ?name= tg-name]>) displays details of the selected Target Group.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
tg-guid	A unique identifier for the Target Group.	Select one of the following: - tg-guid - tg-index - tg-name
tg-index	The index of the Target Group.	
tg-name	The name of the Target Group.	
- cluster-index - OR - cluster-name	The Cluster index or name of the Target Group.	- No – for single cluster configurations or if tg-guid is specified - Yes – for multiple cluster configurations and if the tg-guid is not specified

Output Parameter	Description
acc-num-of-rd	The accumulated number of read and write I/Os since this Volume was created.
bw	Total read and write bandwidth in MB per second
guid	A unique identifier for the Target Group.
index	Target Group's index number as defined by the XMS upon its creation (a unique positive number)
iops	Target's total read and write real-time input/output operations per second
nName	Target Group's name as defined by the user when creating the Target Group

Target Groups

Output Parameter	Description
obj-severity	Target Group's severity, based on severity level of current Alerts (Alerts still uncleared) for this Target Group Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
rd-bw	Total read bandwidth in MB per second
rd-iops	Total read real-time input/output operations per second
sys-id	For the cluster to which this Target-Group belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
tag-list	List of Tags
tg-id	For the Target Group to which this Target belongs, a tuple array containing the following parameters (in the following order): the Target Group's object GUID identifier, the Target Group name, and the Target Group index.
unaligned-bw	Unaligned I/O bandwidth
unaligned-wr-iops	Current IOPS of unaligned write input/output operations per second, addressed at the Target-Group
wr-bw	Total write bandwidth in MB per second
wr-iops	Total write real-time input/output operations per second
xms-id	For the XMS to which this Target Group belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Target Groups

Example Request

```
GET /api/json/v3/types/target-groups/ 3691a6395edc4e929dd6f50ae92264c9
HTTP/1.1
Host: vxms-xbrick238.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "xms-id": [
      "5e9b962c7d844ab684d5252945792cb7",
      "xms",
      1
    ],
    "obj-severity": "information",
    "rd-bw": "0",
    "unaligned-bw": "0",
    "iops": "0",
    "tg-id": [
      "3691a6395edc4e929dd6f50ae92264c9",
      "Default",
      1
    ],
    "wr-iops": "0",
    "guid": "3691a6395edc4e929dd6f50ae92264c9",
    "sys-id": [
      "ed59e939575c48a2bb25554b08732430",
      "xbrickdrm1179",
      1
    ],
    "acc-num-of-rd": "356657014",
    "index": 1,
    "name": "Default",
    "sys-index": 1,
    "unaligned-wr-iops": "0",
    "bw": "0",
    "rd-iops": "0",
    "wr-bw": "0"
  },
  "links": [
    {
      "guid": "3691a6395edc4e929dd6f50ae92264c9",
      "href": "https://vxms-xbrickdrm1179/api/json/v3/types/target-
groups/3691a6395edc4e929dd6f50ae92264c9",
      "rel": "self"
    }
  ]
}
```


Modifying a Target Group

PUT /api/json/v3/types/target-groups/<parameter (tg-guid or tg-index or ?name= tg-name)>

This command (GET /api/json/v3/types/target-groups/<parameter [tg-guid or tg-index or ?name= tg-name]>) enables you to modify the selected Target Group.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
tg-guid	A unique identifier for the Target Group.	Select one of the following:
tg-index	The index of the Target Group.	
tg-name	The name of the Target Group.	
- cluster-index OR - cluster-name	The Cluster index or name of the Target Group.	- No – for single cluster configurations or if tg-guid is specified - Yes – for multiple cluster configurations and if the tg-guid is not specified

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
mtu	Maximum transmission unit (in bytes)	Yes
cluster-id	Cluster's name or index number. May be omitted if only one cluster is defined.	No

Output Parameter	Description
acc-num-of-rd	The accumulated number of read and write I/Os since this Volume was created.
guid	A unique identifier for the Target Group.

Target Groups

Output Parameter	Description
index	Target Group's index number as defined by the XMS upon its creation (a unique positive number)
name	Target Group's name as defined by the user when creating the Target Group
obj-severity	Target Group's severity, based on severity level of current Alerts (Alerts still uncleared) for this Target Group Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
sys-id	For the cluster to which this Target-Group belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags
tg-id	For the Target Group to which this Target belongs, a tuple array containing the following parameters (in the following order): the Target Group's object GUID identifier, the Target Group name, and the Target Group index.
unaligned-bw	Unaligned I/O bandwidth
xms-id	For the XMS to which this Target Group belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/target-groups/765c84f85703456ca2ff2f48f9f9ab70 HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "obj-severity": "information",
    "rd-bw": "0",
    "unaligned-bw": "0",
    "iops": "0",
    "tg-id": [
      "765c84f85703456ca2ff2f48f9f9ab70",
      "Default",
      1
    ],
    "wr-iops": "0",
    "guid": "765c84f85703456ca2ff2f48f9f9ab70",
    "sys-id": [
      "3139f69b7b0e4b21a013bf1c45d4fb00",
      "xbrickdrm847",
      2
    ],
    "acc-num-of-rd": "0",
    "index": 1,
    "name": "Default",
    "sys-index": 2,
    "unaligned-wr-iops": "0",
    "bw": "0",
    "rd-iops": "0",
    "wr-bw": "0"
  },
  "links": [
    {
      "guid": "765c84f85703456ca2ff2f48f9f9ab70",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/target-groups/765c84f85703456ca2ff2f48f9f9ab70",
      "rel": "self"
    }
  ]
}
```

User Accounts

Viewing the List of User Accounts

GET /api/json/v3/types/user-accounts

This command (GET /api/json/v3/types/user-accounts) displays the list of User Accounts.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
- cluster-name OR - cluster-index	Cluster's name or index number	- No – for a single cluster configuration - Yes – for a multiple cluster configuration

Example request

```
GET /api/json/v3/types/user-accounts HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "user-accounts": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/user-accounts/708af8da517f437eb6df4320ce5056ab",
      "name": "admin"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/user-accounts/6e5b93925a66436384b7cd8253b28bbc",
      "name": "admin1"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/user-accounts/6361c877890c49448ff4b9c6c5a27e0f",
      "name": "admin2"
    },
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/user-accounts/877f28662fec4a94b7fe9a8d51573ac0",
      "name": "bob"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/user-accounts/",
      "rel": "self"
    }
  ]
}
```

User Accounts

Viewing the Details of a User Account

GET /api/json/v3/types/user-accounts/<parameter (user-account-guid or user-index or ?name= user-name)>

This command (GET /api/json/v3/types/user-accounts/<parameter [user-account-guid or user-index or ?name=user-name]>) displays details of a User Account.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
user-guid	A unique identifier for the User Account.	Select one of the following: • user-guid • user-index • user-name
user-index	The index of the User Account.	
user-name	The name of the User Account.	

Output Parameter	Description
external-user	Indicates whether this user account is managed by external system, e.g. LDAP. When the user is created via XMS (GUI or CLI), this property is set to False.
guid	A unique identifier for the User Account.
index	User Account's unique index number, as defined by XMS upon its creation
inactivity-timeout	The number of minutes of no activity by a user after which that user is automatically logged out of the XMS. The value is either 0 or a number between 2 and 720 (12 hours). A value of 0 indicates no timeout. A value of 1 cannot be used to avoid an immediate inactivity warning.
name	User Account name, as defined by the user upon its creation (a unique name)
obj-severity	User Account severity, based on severity level of current Alerts. The value is always information.
password	The User Account's password, always shown as null
public-key	The public key SSH that is associated with the user.
role	User Account's role, indicating its capabilities and authorization
user-id	The index number of the User Account object. User Accounts must have a name.

Output Parameter	Description
xms-id	For the XMS to which this User Account belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

GET /api/json/v3/types/user-accounts/ cba9c5a081a140be8c49ac3db611cfc0
HTTP/1.1
Host: vxms-xbrickdrm1179.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

Response

```
{
  "content": {
    "index": 11,
    "password": "xxxxxxx",
    "public-key": "",
    "xms-id": [
      "5e9b962c7d844ab684d5252945792cb7",
      "xms",
      1
    ],
    "name": "ReadOnlyPrefillObj_643",
    "obj-severity": "information",
    "role": "read_only",
    "external-user": false,
    "user-id": [
      "cba9c5a081a140be8c49ac3db611cfc0",
      "ReadOnlyPrefillObj_643",
      11
    ],
    "guid": "cba9c5a081a140be8c49ac3db611cfc0",
    "inactivity-timeout": 10
  },
  "links": [
    {
      "guid": "cba9c5a081a140be8c49ac3db611cfc0",
      "href": "https://vxms-xbrickdrm1179/api/json/v3/types/user-accounts/cba9c5a081a140be8c49ac3db611cfc0",
      "rel": "self"
    }
  ]
}
```

Adding a User Account

POST /api/json/v3/types/user-accounts

This command (POST /api/json/v3/types/user-accounts) enables you to create

User Accounts

a new User Account.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
role	User role ('read_only', 'admin', 'configuration', 'technician')	Yes
usr-name	Username	Yes
password	User password	Select one of the following: - password - public-key
public-key	User public key	
inactivity-timeout	Inactivity timeout in minutes	No

Example request

POST /api/json/v3/types/user-accounts HTTP/1.1
Host: vxms-xbrick1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"usr-name":"ann","role":"read_only","password":"abracadabra"}

Response

```
{
  "links": [
    {
      "guid": "784613dba39d44858215f9cae7ae00e1",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/user-accounts/784613dba39d44858215f9cae7ae00e1",
      "rel": "self"
    }
  ]
}
```

Modifying a User Account

PUT /api/json/v3/types/user-accounts/<parameter (usr-guid or usr-index or ?name= user-name)>

This command (PUT /api/json/v3/types/user-accounts/<parameter [user-guid or user-id or ?name= user-name]>) enables you to modify a User Account.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
usr -guid	A unique identifier for the User Account.	Select one of the following: - usr -guid - usr -id - usr -name
usr -id	The id of the User Account.	
usr -name	The name of the User Account.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
role	User role ('read_only', 'admin', 'configuration', 'technician')	Yes
password	User password	Select one of the following: - password - public-key
public-key	User public key	
inactivity-timeout	Inactivity timeout in minutes	No

User Accounts

Example Request

```
PUT /api/json/v3/types/user-accounts/784613dba39d4488215f9cae7ae00e1 HTTP/1.1
Host: vxms-xbrickdrm487.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"role":"configuration"}
```

Response

Note: The successful completion of this command returns no response.

Removing a User Account

DELETE /api/json/v3/types/user-accounts/<parameter (user-account-guid or user-index or ?name=user-name)>

This command (DELETE /api/json/v3/types/user-accounts/<parameter [user-account-guid or user-index or ?name= user-name]>) enables you to delete a User Account.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
user-guid	A unique identifier for the User Account.	Select one of the following: • user-guid • user-index • user-name
user-index	The index of the User Account.	
user-name	The name of the User Account.	

Example Request

```
DELETE /api/json/v3/types/user-accounts/784613dba39d44858215f9cae7ae00e1
HTTP/1.1
Host: vxms-xbrickdrm487.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Volumes

Viewing the List of Volumes

GET /api/json/v3/types/volumes

This command (GET /api/json/v3/types/volumes) displays the list of all Volumes and their defined parameters.

Example request

```
GET /api/json/v3/types/volumes HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "volumes": [
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/volumes/bd5ca31a6af240318e0b6ac5e49b1629",
      "name": "volspider1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/volumes/139b137570e54f4fa06fc4b0704a36e5",
      "name": "volspider1",
      "sys-name": "xbrickdrml652"
    },
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/volumes/4ef54d995e544e2ebab88a1c9c5efd97",
      "name": "volspider2",
      "sys-name": "xbrickdrml652"
    },
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/volumes/e114700ac1ad4123984a85401cfb3c95",
      "name": "volspider2",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrml652/api/json/v3/types/volumes/f8a5067f25b44e2ca09f1c0b120d8199",
      "name": "volspider3",
      "sys-name": "xbrickdrml652"
    }
  ]
}
```

```

    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/volumes/3c7dde18ffe643d8a12b4486658384bf",
      "name": "volspider3",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/volumes/fd6674cb407c4e64b78b3a5db66edc07",
      "name": "volspider4",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/volumes/f96e539d6c77446a8cab268cdf26b3d7",
      "name": "volspider4",
      "sys-name": "xbrick224-rename"
    },
    ...
    {
      "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/volumes/a52006e63d00472fbcc692d7c909626e",
      "name": "DB02.1532430006128",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/",
      "rel": "self"
    }
  ]
}

```

Volumes

Viewing the Details of a Volume

GET /api/json/v3/types/volumes/<parameter (vol-guid) or vol-index or ?name= vol-name>

This command (GET /api/json/v3/types/volumes/<parameter [vol-guid or vol-index or ?name= vol-name]>) displays details of the selected Volume.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
vol-guid	A unique identifier for the Volume.	Select one of the following: • vol-guid • vol-index • vol-name
vol-index	The index of the Volume.	
vol-name	The name of the Volume.	
• cluster-index OR • cluster-name	The Cluster index or name of the Volume.	• No – for single cluster configurations or if vol-guid is specified • Yes – for multiple cluster configurations and if the vol-guid is not specified

Output Parameter	Description
acc-num-of-rd	Total accumulative number of read operations having occurred during the Volume's lifespan
acc-num-of-small-rd	Accumulated number of small reads input/output operations of the Volume
acc-num-of-small-wr	Accumulated number of small writes input/output operations recursively contained by this Volume
acc-num-of-unaligned-rd	Volume's accumulated number of I/Os since adding an Initiator
acc-num-of-unaligned-wr	Cluster's total number of accumulated unaligned writes

Volumes

Output Parameter	Description
acc-num-of-wr	Accumulative number of write operations having occurred during the Volume's lifespan
acc-size-of-rd	Accumulative capacity KB size of read operations having occurred during the Volume's lifespan
acc-size-of-wr	Accumulative capacity KB size of write operations having occurred during the Volume's lifespan
alignment-offset	The alignment offset range is between 0-15.
ancestor-vol-id	Holds the Volume's Snapshot source index number. This parameter points to an object from which the Snapshot was created, providing that the "ancestor" object is not deleted, or that create-snapshot-and-reassign was not applied.
ancestor-vol-name	The name of the Volume from which the Volume's Snapshot was created.
application-type	The host application type using the Volume, as specified by the user. Values: - epic - Epic - hyper_v_vm - Hyper-V VM - oracle_db - Oracle DB - other - other - other_db - other DB - sap - SAP - sql_server - SQL Server - vdi - VDI - vmware_vm - VMware
avg-latency	Total real-time average latency of read and write operations, measured in μ s
bw	Total real-time read and write bandwidth in MB per second
calculate-savings-timestamp	The date and time (in UTC) of the last scanning of the Volume.
certainty	Indicates confidence that the XMS and the cluster are synchronized. The value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
created-by-app	Denotes the application which created the object.
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may including the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, VIPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath.

Volumes

Output Parameter	Description
created-from-volume	This parameter contains the snapped_object Volume name, as it was at the Snapshot's creation time, or null when the Volume was not created from a Snapshot. The string remains unchanged when the ancestor is renamed, deleted or reassigned.
creation-time	Volume's creation timestamp (UTC)
data-reduction-ratio	The ratio of the total Volume capacity to the total used capacity.
dest-snap-list	Number of Volumes directly Snapshotted from the Volume, and list of their object IDs (if any)
guid	A unique identifier for the Volume.
host-accessible-size	The amount of non-zero data that can be read from the Volume.
index	Volume's index number as defined by the XMS upon its creation (a unique positive number)
iops	Volume's total read and write real-time input/output operations per second
last-refresh-from-obj-id	The Id of the object used to refresh this Consistency Group, using any type of snap-and-reassign operation (for X2 clusters only)
last-refreshed-from-obj-name	The name of the object used to refresh this Consistency Group, using any type of snap-and-reassign operation (for X2 clusters only)
last-refresh-time	The time this Consistency Group was last refreshed (for X2 clusters only)
lb-size	The "sector size" (LB size) of the Volume
logical-space-in-use	The total used Volume capacity in all clusters managed by the XMS
lun-mapping-list	List of LUN mappings currently associated with the Volume, possibly empty, indicating that the Volume is currently unexposed
management-locked	This indicates whether the Volume cannot be deleted and its data modified through refresh-and-restore operations. (for X2 clusters only).
manager-guid	The object GUID identifier of the XMS.
naa-name	Volume's WWN/NAA name, globally unique and unique over time, set by the XMS (or by cluster) once a LUN is mapped to the Volume for the first time
name	Volume's name
num-of-dest-snaps	Number of Volumes directly Snapshotted from this Volume
num-of-lun-mappings	Number of LUN mappings defined for this Volume

Output Parameter	Description
obj-severity	Volume's severity, based on severity level of current Alerts (Alerts still uncleared) for this Volume. Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
qos-effective-bw	The effective bandwidth of the QoS Policy specified by qos-policy-id for this Volume.
qos-effective-burst-bw	The effective burst bandwidth limit calculated as the following: • If the burst-percentage is 0, then the qos-effective-max-bw • If the burst-percentage is not 0, then burst-percentage times qos-effective-max-bw divided by 100.
qos-effective-max-bw	The effective maximum bandwidth which depends upon the limit-type of the QoS Policy specified by qos-policy-id for this Volume as follows: • fixed – if the limit-type is fixed, then the effective maximum bandwidth is the QoS Policy's max-bw (if max-bw is specified), or the QoS Policy's max-iops multiplied by the io-size (if max-iops is specified). • adaptive – if the limit-type is adaptive, then the effective maximum bandwidth is the size of the Volume multiplied by the QoS Policy's io-size.
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Volume: Values: • disabled – the QoS Policy is not enforced • enabled – the QoS Policy is enforced • monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected.
qos-exceeded-bw	The bandwidth of IOs exceeding the QoS Policy specified by qos-policy-id. If the qos-enabled-mode is enabled, then these IOs were rejected.
qos-exceeded-iops	The number of IOPS rejected for exceeding the QoS Policy specified by qos-policy-id
qos-implicit-obj-list	A list of objects associated with the QoS Policy specified by qos-policy-id and this Volume.

Volumes

Output Parameter	Description
qos-policy-id	For the QoS Policy associated with this Volume, a tuple array containing the following parameters (in the following order): the QoS Policy object GUID identifier, the QoS Policy name, and the QoS Policy index
performance-data-collection	Indicates whether this Volume's performance data collection is inherited from the cluster's specification for performance data collection which can be enabled or disabled, or this Volume's data collection is enabled and not inheriting from the cluster's specification. If the cluster's specification is performance data collection disabled, this Volume cannot be enabled. Values: - enabled – performance data collection is enabled and the cluster level specification is ignored - inherit_from_cluster – performance data collection is the cluster level specification which can be enabled or disabled. Note: To disable a Volume's performance data collection, the cluster level specification must be disabled for all Volumes. A single Volume or group of Volumes cannot be individually disabled.
rd-bw	Total real-time read bandwidth in MB per second
rd-iops	Total read real-time input/output operations per second
rd-latency	Total real-time average latency of read operations, measured in μ s
related-consistency-groups	The Volume's related Consistency Group(s) ID(s), when relevant
replication-rd-bw-kbps	The read bandwidth consumed for replication.
replication-rd-iops-16kb	The number of read IOPS per 16kb page transfer.
replication-wr-bw-kbps	The write bandwidth consumed for replication.
replication-wr-iops-16kb	The number of write IOPS per 16kb page transfer.
secured-snap	Indicates whether the Volume is protected from manual manipulation, as long as the secured-expiration-time is not exceeded.
secured-snap-expiration-time	Indicates until what time the Volume is protected from manual manipulation. (The Volume is usually deleted by the retention policy mechanism.)
small-bw	Current bandwidth of small input/output operations, addressed at the Volume
small-io-alerts	When Volume parameters of small-io-alerts is set to disabled (default), no Alerts are sent for a high number of small I/Os.

Volumes

Output Parameter	Description
small-iops	Current IOPS of small input/output operations per second
small-io-ratio	The accumulated number of unaligned I/O divided by the total accumulated number of I/Os to the Volume, in percent
small-io-ratio-level	Event triggered whenever the unaligned-io-ratio level changes
small-rd-bw	Current bandwidth of small read input/output operations, addressed at the Volume
small-rd-iops	Current IOPS of small read input/output operations
small-wr-bw	Volume's small write bandwidth
small-wr-iops	Current IOPS of small write input/output operations
snapgrp-copy-efficiency	The ratio of the SnapshotGroup (VSG) readable logical space to its actual logical space in use, including all Volumes.
snapgrp-drr	The Volume SnapshotGroup's (VSG) data reduction ratio.
snapgrp-id	The Volume Snapshot Group (VSG) Index
snapgrp-index	The Snapgroup index.
snapgrp-name	The Snapgroup name.
snapgrp-unique-physical-space	The minimum amount of physical capacity that will be reclaimed if the SnapshotGroup (VSG) is deleted.
snapshot-list	Lists names of the Snapshot Set containing the selected Snapshot. Value for a Volume is always null
snapshot-type	The Snapshot is regular (default) or read-only.
sys-id	For the cluster to which this Volume belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	Volume's list of Tags
unaligned-bw	Current IOPS of unaligned bandwidth input/output operations
unaligned-io-alerts	When this Volume parameter is set to disabled (default), no Alerts are sent for a high number of unaligned I/Os.
unaligned-iops	Unaligned input/output operations per second
unaligned-io-ratio	Accumulated number of unaligned I/O divided by the total accumulated number of I/Os to the Volume, in percent
unaligned-io-ratio-level	Event triggered whenever the unaligned-io-ratio level changes
unaligned-rd-bw	Current bandwidth of unaligned read input/output operations

Volumes

Output Parameter	Description
unaligned-rd-iops	Current IOPS of unaligned read input/output operations per second
unaligned-wr-bw	Current bandwidth of unaligned write input/output operations
unaligned-wr-iops	Current IOPS of unaligned write input/output operations per second
unique-physical-space	The minimum amount of physical capacity that will be reclaimed if the Volume is deleted, measured in Kbytes.
vaai-tp-alerts	The VAAI Soft Limit warning for this Volume is reported when monitoring is enabled. The threshold is a cluster-wide value as configured in the cluster <code>vaai_tp_limit</code> . The default is disabled.
vol-access	Denotes the type of Volume and its accesibility.
vol-id	For this Volume, a tuple array containing the following parameters (in the following order): the Volume's object GUID identifier, the Volume name, and the Volume index.
vol-size	Total provisioned capacity. Volume KB size as exposed to Initiators
vol-type	Denotes the Volume type. Values: - regular - readonly
wr-bw	Total real-time write bandwidth in MB per second
wr-iops	Total write real-time input/output operations per second
wr-latency	Total real-time average latency of write operations, measured in μ s
xms-id	For the XMS to which this Volume belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/volumes/febd3c6fd234299994d5edefbdf84d8 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "content": {
    "ancestor-vol-name": "ReadOnlyPrefillObj_643",
    "small-io-alerts": "disabled",
    "last-refreshed-from-obj-name": "ReadOnlyPrefillObj_643",
    "small-iops": "0",
    "wr-latency": "0",
    "obj-severity": "information",
```

```

"rd-bw": "0",
"unaligned-rd-bw": "0",
"num-of-dest-snaps": 0,
"management-locked": false,
"iops": "0",
"num-of-lun-mappings": 0,
"replication-wr-bw-kbps": 0,
"small-io-ratio-level": "ok",
"lb-size": 512,
"qos-exceeded-iops": "0",
"unaligned-io-ratio-level": "ok",
"acc-num-of-rd": "0",
"data-reduction-ratio": "0",
"qos-enabled-mode": "",
"acc-size-of-wr": "0",
"unaligned-rd-iops": "0",
"snapgrp-id": [
  "90cb2ff6b85f421483994aebc231d043",
  "",
  226
],
"ancestor-vol-id": [
  "80fb77716d1e4004833edf796eabc225",
  "ReadOnlyPrefillObj_643",
  274
],
"replication-rd-iops-16kb": 0,
"unaligned-io-alerts": "disabled",
"qos-exceeded-bw": "0",
"last-refresh-from-obj-id": "80fb77716d1e4004833edf796eabc225",
"unique-physical-space": "0",
"acc-num-of-unaligned-rd": "0",
"tag-list": [],
"calculate-savings-timestamp": "",
"vol-access": "write_access",
"unaligned-io-ratio": "0",
"lun-mapping-list": [],
"wr-iops": "0",
"sys-id": [
  "ed59e939575c48a2bb25554b08732430",
  "xbrickdrm1179",
  1
],
"rd-latency": "0",
"vaai-tp-alerts": "disabled",
"name": "ReadOnlyPrefillObj_643.1535119200432-1",
"acc-num-of-unaligned-wr": "0",
"related-consistency-groups": [],
"acc-num-of-wr": "0",
"acc-size-of-rd": "0",
"unaligned-wr-bw": "0",
"small-rd-iops": "0",
"replication-wr-iops-16kb": 0,
"host-accessible-size": "0",
"created-by-app": "scheduler",
"dest-snap-list": [],
"vol-id": [
  "feebd3c6fd234299994d5edefbdf84d8",
  "ReadOnlyPrefillObj_643.1535119200432-1",

```

Volumes

```

    2000729
  ],
  "unaligned-iops": "0",
  "snapgrp-index": 226,
  "snapgrp-copy-efficiency": "0",
  "snapgrp-unique-physical-space": "0",
  "sys-index": 1,
  "qos-effective-bw": null,
  "alignment-offset": 0,
  "snapshot-type": "regular",
  "logical-space-in-use": "0",
  "index": 2000729,
  "rd-iops": "0",
  "small-rd-bw": "0",
  "naa-name": "",
  "snapset-list": [
    [
      "41771e8fde5e499ebe49b2848cdc39eb",
      "SnapShotSet.1535119200432-1",
      2001036
    ]
  ],
  "created-by-external-client": "",
  "acc-num-of-small-rd": "0",
  "acc-num-of-small-wr": "0",
  "created-from-volume": "ReadOnlyPrefillObj_643",
  "creation-time": "2018-08-24 14:00:00",
  "xms-id": [
    "5e9b962c7d844ab684d5252945792cb7",
    "xms",
    1
  ],
  "snapgrp-drr": "0",
  "small-wr-bw": "0",
  "last-refresh-time": "1535119200206",
  "qos-implicit-obj-list": [],
  "unaligned-bw": "0",
  "replication-rd-bw-kbps": 0,
  "bw": "0",
  "vol-size": "10240",
  "manager-guid": "80fb77716d1e400483edf796eabc225",
  "avg-latency": "0",
  "small-wr-iops": "0",
  "guid": "feebd3c6fd234299994d5edefbdf84d8",
  "small-bw": "0",
  "qos-policy-id": [],
  "snapgrp-name": "",
  "certainty": "ok",
  "vol-type": "regular",
  "small-io-ratio": "0",
  "qos-effective-burst-bw": "0",
  "unaligned-wr-iops": "0",
  "performance-data-collection": "inherit_cluster_mode",
  "qos-effective-max-bw": "0",
  "application-type": "",
  "wr-bw": "0",
  "sys-name": "xbrickdrm1179"

```

Volumes

```
    },  
    "links": [  
      {  
        "guid": "feebd3c6fd234299994d5edefbdf84d8",  
        "href": "https://vxms-  
xbrickdrm1179/api/json/v3/types/volumes/feebd3c6fd234299994d5edefbdf84d8",  
        "rel": "self"  
      }  
    ]  
  }  
}
```

Volumes

Adding a New Volume

POST /api/json/v3/types/volumes

This command (POST /api/json/v3/types/volumes) enables you to create a new Volume.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
cluster-id	Cluster's name or index number	Yes
vol-name	Volume's name	Yes
vol-size	- The Volume's disk space size in: K (KB) / M (MB) / G (GB) / T (TB) / P (PB), limited to 1 PB - The minimum Volume size is 1 MB. - The Volume size must be in multiples of 16 KB for X2 clusters and 8K for X1 clusters - Does not indicate the actual SSD space consumed by Volume. - Must be an integer greater than 0.	Yes
alignment-offset	The alignment offset for Volumes of 512 LB size is between 0 and 7. If omitted, the offset value is 0. Volumes of logical block size 4096 must not be defined with an offset.	No
application-type	The host application type using the Volume, as specified by the user. Values: - epic - Epic - hyper_v_vm – Hyper-V VM - oracle_db – Oracle DB - other - other - other_db – other DB - sap - SAP - sql_server – SQL Server - vdi - VDI - vmware_vm - VMware	No

Volumes

Input Parameter	Description	Mandatory
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may including the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath. Note: This is a Volume property associated with each Volume associated with the repurpose copy of the Snapshot Set.	No
lb-size	Logical block size in bytes. Can either be 512 or 4096 bytes.	No
management-locked	This indicates whether the new Volume created by this command will be defined as management-locked Volumes. Management-locked Volumes cannot be deleted and their data cannot be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked	No
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Volume: Values: - disabled – the QoS Policy is not enforced - enabled – the QoS Policy is enforced - monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected. The default value is enabled.	No
qos-policy-id	The Id of the QoS Policy object to associate with this Consistency Group.	No
small-io-alerts	Enable or disable small input/output Alerts.	No
unaligned-io-alerts	Enable or disable unaligned I/O Alerts.	No
tag-list	Volume's list of Tags	No
vaai-tp-alerts	Enable or disable VAAI TP Alerts.	No

Example request

```
POST /api/json/v3/types/volumes HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
```

Volumes

Authorization: Basic *****

Cache-Control: no-cache

```
{"cluster-id":"xbrickdrm1652","vol-name":"TW-Vol-D-01","vol-size":"8m","qos-policy-id":1,"qos-enabled-mode":"enabled"}
```

Response

```
{
  "links": [
    {
      "guid": "89f9f0ed2cf04a97b0e5e4d2fdaa7e0b",
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/89f9f0ed2cf04a97b0e5e4d2fdaa7e0b",
      "rel": "self"
    }
  ]
}
```

Modifying a Volume

PUT /api/json/v3/types/volumes/<parameter (vol-guid) or vol-id or ?name= vol-name)>

This command (PUT /api/json/v3/types/volumes/<parameter [vol-guid or vol-id or ?name= vol-name]>) enables you to modify properties of the selected Volume.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
vol-guid	A unique identifier for the Volume.	Select one of the following: • vol-guid • vol-id • vol-name
vol-id	The id of the Volume.	
vol-name	The name of the Volume.	
• cluster-index OR • cluster-name	The Cluster index or name of the Volume.	• No – for single cluster configurations or if vol-guid is specified • Yes – for multiple cluster configurations and if the vol-guid is not specified

Volumes

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
qos-enabled-mode	Indicates whether the QoS Policy specified by the qos-policy-id is enabled for this Initiator-Group: Values: - disabled – the QoS Policy is not enforced - enabled – the QoS Policy is enforced - monitor_only – the QoS Policy is only used for monitoring and the potentially rejected IOs are counted, but not rejected. The default value is enabled.	Select at least one of the following: - qos-enabled-mode - qos-policy-id - management-locked - remove-qos-policy - small-io-alerts - unaligned-io-alerts - vaai-tp-alerts - vol-access - vol-name - vol-size But not both of the following: - qos-policy-id - remove-qos-policy
qos-policy-id	The Id of the QoS Policy object to associate with this Consistency Group. Note: If qos-policy-id is specified, remove-qos-policy cannot be specified.	
management-locked	This indicates whether the Volume modified by this command can be deleted and its data can be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked.	
remove-qos-policy	Indicates whether to remove the associated QoS Policy. Note: If remove-qos-policy is specified, qos-policy-id cannot be specified.	
small-io-alerts	Enable or disable small input/output Alerts.	
unaligned-io-alerts	Enable or disable unaligned input/output Alerts.	
vaai-tp-alerts	Enable or disable VAAI TP Alerts.	

Volumes

Input Parameter	Description	Mandatory
vol-access	A Volume is created with write access rights. Volumes can be modified after being created and have their access levels' changed. Volumes can have one of the following access write levels: - no_access - All SCSI commands for accessing data on the Volume (read commands and write commands) fail, and all SCSI discovery commands (i.e. inquiries on Volume characteristics and not accessing the data on the Volume) succeed. - read_access - All SCSI write commands fail and all SCSI read commands and discovery commands succeed. - write_access - All commands succeed and the host can write to the Volume.	Select at least one of the following: - qos-enabled-mode - qos-policy-id - management-locked - remove-qos-policy - small-io-alerts - unaligned-io-alerts - vaai-tp-alerts - vol-access - vol-name - vol-size
vol-name	Volume's name	But not both of the following: - qos-policy-id - remove-qos-policy
vol-size	- The Volume's disk space size in: K (KB) / M (MB) / G (GB) / T (TB) / P (PB), limited to 2 PB - The minimum Volume size is 1 MB. - The Volume size must be in multiples of 16 KB for X2 clusters and 8K for X1 clusters. - Reflects the Volume size available to Initiators. - Does not indicate the actual SSD space consumed by Volume. Must be an integer greater than 0.	
application-type	The host application type using the Volume, as specified by the user. Values: - epic - Epic - hyper_v_vm - Hyper-V VM - oracle_db - Oracle DB - other - other - other_db - other DB - sap - SAP - sql_server - SQL Server - vdi - VDI - vmware_vm - VMware	No

Note: A cluster can also be defined as `cluster-name` or `cluster-index` in the URL, however the cluster definition should only be entered in one location, either the URL or the body.

Volumes

Example Request

```
PUT /api/json/v3/types/volumes/44ffbe8804954346b0e5b639aa695516 HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"small-io-alerts":"disabled"}
```

Response

Note: The successful completion of this command returns no response.

Removing a Volume

DELETE /api/json/v3/types/volumes/<parameter (vol-guid or vol-id or ?name= vol-name)>

This command (DELETE /api/json/v3/types/volumes/<parameter [vol-guid or vol-id or ?name= vol-name]>) enables you to delete a Volume.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
vol-guid	A unique identifier for the Volume.	Select one of the following: • vol-guid • vol-id • vol-name
vol-id	The id of the Volume.	
vol-name	The name of the Volume.	
• cluster-index OR • cluster-name	The Cluster index or name of the Volume.	• No – for single cluster configurations or if vol-guid is specified • Yes – for multiple cluster configurations and if the vol-guid is not specified

Note: A cluster can also be defined as `cluster-id` in the body, however the cluster definition should only be entered in one location, either the URL or the body.

Example Request

```
DELETE /api/json/v3/types/volumes/fe6b5829c7ce4bd592cc464d9878139c HTTP/1.1
Host: vxms-xbrick238.xiodrm.lab.emc.com
Authorization: Basic b3BlcmF0aw9u0m9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

Note: The successful completion of this command returns no response.

Note: Supported for X2 hardware cluster types only.

The command (PUT /api/json/v3/commands/volumes/create-repurpose-copy) enables you to create a repurpose copy for a new Volume and creates new Snapshot Sets in the new Volume.

Input Parameter	Description	Mandatory
from-volume-list	The unique identifier(s) of the Volume(s) from which the new linked Consistency Group will be created.	Yes
cluster-id	The name or index of the Cluster to which the Consistency Group belongs.	No
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VM Turbo, and PowerPath.	No
management-locked	This indicates whether the new Volume(s) created by this command will be defined as management-locked Volumes. Management-locked Volumes cannot be deleted and their data cannot be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked	No
new-vol-suffix	The suffix to use for the new Consistency GroupVolume.	No
new-snapshot-set-name	The name of the new Snapshot-Set to create. The only valid characters are alphanumeric, spaces and the following characters ~!@#\$%^*_+{} :;.-	No

Output Parameter	Description
volumes	The list of new Volumes created, including their href, index, guid, and name..
snapshot-set	The details of the new Snapshot-Sets created by the copy creation, including their href, index, guid, and names.

Volumes

Example

PUT /api/json/v3/commands/volumes/create-repurpose-copy

Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com

Authorization: Basic *****

Cache-Control: no-cache

```
{
  "from-volume-list": [
    [
      "4862fe4bddd941f595a00652fb5244f4",
      "61ef99db693a4d70b9ce639022662cb0"
    ],
    "new-vol-suffix": "QA"
  ]
}
```

Response

```
{
  "content": {
    "volumes": [
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/688e4d4106ce443bb1114b6c22da410f",
        "index": 115,
        "guid": "688e4d4106ce443bb1114b6c22da410f",
        "name": "TechWriter-02.QA"
      },
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/192d36a8d5064213a2043f126426bf6b",
        "index": 116,
        "guid": "192d36a8d5064213a2043f126426bf6b",
        "name": "TechWriter-01.QA"
      }
    ],
    "snapshot-set": {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/f17fa18496664fee9b236a05e77dfbe0",
      "index": 34,
      "guid": "f17fa18496664fee9b236a05e77dfbe0",
      "name": "SnapshotSet.1528629652085"
    }
  },
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/commands/volumes/create-repurpose-copy/",
      "rel": "self"
    }
  ]
}
```

Refreshing Data from a Volume

Note: Supported for X2 hardware cluster types only.

PUT /api/json/v3/commands/volumes/refresh-data

The command (PUT /api/json/v3/commands/volumes/refresh-data) refreshes data from a Volume to a Volume.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-volume-id	The unique identifier of the source Volume.	Yes
to-volume-id	The unique identifier of the target Volume.	Yes
backup-snap-suffix	The suffix added to the backup Snapshot-Set.	No
cluster-id	The name or index of the system to which this Consistency Group belongs.	No
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may include the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath.	No
dry-run	The option to perform the refresh as a dry-run. A dry-run does not perform the refresh, however the response returns the link information as if a refresh were performed. Any value triggers a dry run.	No
ignore-empty-pair	Indicates whether this operation succeeds or fails if one or more Volumes are missing on either the source or target of the refresh. Values: <code>true</code> – the operation succeeds if one or more Volumes are missing <code>false</code> – the operation fails if one or more Volumes are missing	No

Volumes

Input Parameter	Description	Mandatory
no-backup	Indicates whether to keep a backup of the Snapshot-Set. Values: - true – keep a backup - false – do not keep a backup If not specified, the default value is true.	No
snapshot-set-name	The name for the new Snapshot-Set that will be created.	No

Example Request

PUT /api/json/v3/commands/volumes/refresh-data HTTP/1.1

Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com

Authorization: Basic *****

Cache-Control: no-cache

```
{"from-volume-id":["61ef99db693a4d70b9ce639022662cb0"],"to-volume-id":["3e3623f1f21e4c6a94891a5123329ee7"]}
```

Response

Note: The successful completion of this command returns no response.

Note: Misaligned Volumes cannot be refreshed without the "ignore-empty-pair" parameter. The completion code for attempting to refresh a misaligned Volume without the "ignore-empty-pair" parameter is, "restricted_fail_positon_failed".

Refreshing Data from a Volume – Dry-Run

Note: Supported for X2 hardware cluster types only.

PUT /api/json/v3/commands/volumes/refresh-data

The command (PUT /api/json/v3/commands/volumes/refresh-data) enables you to view the Volume relationships for which the refresh operation can execute.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-volume-id	The unique identifier of the source Volume.	Yes
to-volume-id	The unique identifier of target Volume.	Yes
dry-run	The option to perform the refresh as a dry-run. A dry-run does not perform the refresh, however the response returns the link information as if a refresh were performed. Note: Any value triggers a dry run.	Yes
cluster-id	The name or index of the system to which this Consistency Group belongs.	No
ignore-empty-pair	Indicates whether this operation succeeds or fails if one or more Volumes are missing on either the source or target of the refresh. Values: <code>true</code> – the operation succeeds if one or more Volumes are missing <code>false</code> – the operation fails if one or more Volumes are missing	No
no-backup	Indicates whether to keep a backup of the Snapshot-Set. Values: <code>true</code> – keep a backup <code>false</code> – do not keep a backup If not specified, the default value is <code>true</code> .	No
snapshot-set-name	The name for the new Snapshot-Set that will be created.	No

Volumes

Example Request

```
PUT /api/json/v3/commands/volumes/refresh-data HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-volume-id":["61ef99db693a4d70b9ce639022662cb0"],"to-volume-id":["3e3623f1f21e4c6a94891a5123329ee7"],"dry-run":"true"}
```

Response

Note: The successful completion of this command returns no response.

Note: Creating a repurpose copy from an SnapshotSet level if the SnapshotSet originated from a Volume / Volume list is a restricted option, because the Volume / Volume list is not grouped. The completion code for this restricted option is, "ss_parent_cg_is_not_valid".

Note: Misaligned Volumes cannot be refreshed without the "ignore-empty-pair" parameter. The completion code for attempting to refresh a misaligned Volume without the "ignore-empty-pair" parameter is, "restricted_fail_positon_failed".

Restoring Data to a Volume

Note: Supported for X2 hardware cluster types only.

PUT /api/json/v3/commands/volumes/restore-data

The command (PUT /api/json/v3/commands/volumes/restore-data) restores data from a Volume to a Volume.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-volume-id	The unique identifier of the Volume from which a new Snapshot will be created	Yes
to-volume-id	The unique identifier of the Volume to which a new Snapshot will be created	Yes
cluster-id	The name or index of the system to which this Consistency Group belongs.	No
dry-run	The option to perform the refresh as a dry-run. A dry-run does not perform the refresh, however the response returns the link information if a refresh were performed. Any value triggers a dry run.	No
snapshot-set-name	The backup Snapshot-Set name.	No
backup-snap-suffix	The backup Snapshot-Set suffix	No

Volumes

Example Request

```
PUT /api/json/v3/commands/volumes/restore-data HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-volume-id":["4862fe4bddd941f595a00652fb5244f4"],"to-volume-id":["3e3623f1f21e4c6a9491a5123329ee7"]}
```

Response

Note: The successful completion of this command returns no response.

Note: Creating a repurpose copy from an SnapshotSet level if the SnapshotSet originated from a Volume / Volume list is a restricted option, because the Volume / Volume list is not grouped. The completion code for this restricted option is, "ss_parent_cg_is_not_valid".

Note: Misaligned Volumes cannot be refreshed without the "best_effort" parameter. The completion code for attempting to refresh a misaligned Volume without the "best_effort" parameter is, "restricted_fail_positon_failed".

Creating a Protection Copy of a Volume

PUT /api/json/v3/commands/volume/create-protection-copy

This command (PUT /api/json/v3/commands/volume/create-protection-copy) enables you to create a read-only Snapshot of an existing Volume.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
from-volume-list	The list unique identifiers of the Volumes to copy.	Yes
cluster-id	The name or index of the system to which this Volume belongs.	No
created-by-external-client	For ecosystem products initiating data operations (for example, create, refresh, or restore data operations), this is the name of the external client initiating the data operation. This parameter is not limited to specific values. Possible values may including the following: AppSync, PowerShell, OpenStack, VPLEX, SMI-S, VSI, ESI, NetWorker, CommVault, SRA, ViPR, ProtectPoint, DPA, Cirrus, VMTurbo, and PowerPath.	No
management-locked	This indicates whether the new Volume(s) created by this command will be defined as management-locked Volumes. Management-locked Volumes cannot be deleted and their data cannot be modified through refresh-and-restore operations. Values: - enabled – The Volume is locked. - disabled – The Volume is not locked	No
new-snapshot-set-name	The new name of the new Snapshot Set.	No
new-vol-suffix	The suffix of the newly created Snapshot-Set. If a suffix is not provided, then the existing Volume name will be used and the suffix will be an Epoch format timestamp (seconds since 1/1/1970). A timestamp is used because unnamed Snapshot Sets are not be supported,	No

Volumes

Example Request

```
PUT /api/json/v3/commands/volumes/create-protection-copy HTTP/1.1
Host: vxms-xbrickdrm353.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"from-volume-list":["DB01"]}
```

Response

```
{
  "content": {
    "volumes": [
      {
        "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/6b7190f3041d4896879e7673fb264447",
        "index": 119,
        "guid": "6b7190f3041d4896879e7673fb264447",
        "name": "DB01.1528630799876"
      }
    ],
    "snapshot-set": {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/snapshot-sets/aa3934c6c0074c8481cbea2178ddb094",
      "index": 36,
      "guid": "aa3934c6c0074c8481cbea2178ddb094",
      "name": "SnapshotSet.1528630799876"
    }
  },
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/commands/volumes/create-protection-copy/",
      "rel": "self"
    }
  ]
}
```

Modifying the Performance Data Collection Mode for Volumes

PUT /api/json/v3/ commands/volumes/modify-performance-data-collection

This command (PUT /api/json/v3/ commands/volumes/modify-performance-data-collection) modifies the performance data collection mode of the specified Volumes.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
collection-mode	Indicates whether the Volume(s) listed in vol-list inherit the cluster level enable/disable specification for performance data collection, or the Volume(s) listed in vol-list are enabled for performance data collection. Volumes can only be enabled if the cluster's specification disabled. Volumes cannot be disabled if the cluster's specification is enabled. Values: - enabled – if the cluster level specification is disabled, then performance data collection is enabled for the Volume(s) - inherit_from_cluster – performance data collection is the cluster level specification (can be enabled or disabled).	Yes
vol-list	The list of Volume Ids to modify performance data collection.	Yes
cluster-id	The name or index of the system to which the Volume(s) belong.	No

Volumes

Example request

```
PUT /api/json/v3/types/modify-performance-data-collection HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"collection-mode":"enabled","vol-list":["TW-01"]}
```

Response

Note: The successful completion of this command returns no response.

Volume Copies

Viewing the List of Protection Copies of a Volume

GET /api/json/v3/types/volume-copies/<parameter (vol-guid) or vol-index or ?name= vol-name>

This command (GET /api/json/v3/types/volume-copies/<parameter (vol-guid or vol-index or ?name= vol-name]>) displays the list of all Snapshot Set copies of the specified Volume.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
vol-guid	A unique identifier for the Volume.	Select one of the following: • vol-guid • vol-index • vol-name
vol-index	The index of the Volume.	
vol-name	The name of the Volume.	
protection-only	Allows selecting only read-only copies directly created from the selected source Volume. Values: • False – disable • True – enable	No
• cluster-index OR • cluster-name	The Cluster index or name of the Volume.	• No – for single cluster configurations or if vol-guid is specified • Yes – for multiple cluster configurations and if the vol-guid is not specified

Volume Copies

Example request

```
GET /api/json/v3/types/volume-copies/b7997f509ff042eb8528f494deaf171a HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "volumes": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/b7997f509ff042eb8528f494deaf171a",
      "name": "DB01"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/53a2dffe40b4a2a9b2adf479a0a159b",
      "name": "DB01.1522138147418"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/8febb8d2bea14656b7e31ef201500819",
      "name": "DB01.1522153033051"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volumes/f341b5d572d944bfaa52d081cbce3772",
      "name": "DB01.1522209688317"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/volume-copies/",
      "rel": "self"
    }
  ]
}
```

Volume Pairs

Viewing the List of Volume Pairs

GET /api/json/v3/types/volume-pairs

This command (GET /api/json/v3/types/volume-pairs) displays the list of all Volume-Pairs and their defined parameters.

Example request

```
GET /api/json/v3/types/volume-pairs HTTP/1.1
Host: vxms-xbrick1318.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  'volume-pairs': [
    {
      'href': 'https://vxms-xbrickdr
xbrickdr1318/api/json/v3/types/volume-pairs/8663a701b80a4c1ea5be6e7359bcb37a',
      'name': 'vp-xbrickdr1318-xbrickdr1319-1320-1_1',
      'sys-name': None
    },
    {
      'href': 'https://vxms-xbrickdr
xbrickdr1318/api/json/v3/types/volume-pairs/dfac2f43945848838be4f50ec0328060',
      'name': 'vp-xbrickdr1318-xbrickdr1319-1320-2_1',
      'sys-name': None
    }
  ]
}
```

Viewing the Details of a Volume Pair

GET /api/json/v3/types/volume-pairs/<parameter (vol-pair-guid) or vol-pair-index or ?name= vol-pair-name>

This command (GET /api/json/v3/types/volumes/<parameter [vol-pair-id-guid or vol-pair-index or ?name= vol-pair-name]>) displays details of the selected Volume-Pair.

For this command, input parameters (as described in the following table), should

Volume Pairs

be entered in the URL.

Input Parameter	Description	Mandatory
vol- pair-guid	A unique identifier for the Volume-Pair.	Select one of the following: • vol-pair-guid • vol-pair-index • vol-pair-name
vol-pair-index	The index of the Volume-Pair.	
vol-pair-name	The name of the Volume-Pair.	
• cluster-index - OR • cluster-name	The Cluster index or name of the Volume-Pair.	• No – for single cluster configurations or if vol-pair-guid is specified • Yes – for multiple cluster configurations and if the vol-pair-guid is not specified

Output Parameter	Description
certainty	Indicates confidence that the XMS and the cluster are synchronized. The value changes from OK if a request is sent while the XMS is unable to determine the success of the request.
guid	The object GUID identifier of the Volume-Pair.
index	The index of the Volume-Pair.
name	The name of the Volume-Pair.
obj-severity	Volume's severity, based on severity level of current Alerts (Alerts still uncleared) for this Volume Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.

Volume Pairs

Output Parameter	Description
replication-session-pairing-label-id	The Replication Session Id containing this Volume Pair.
rm-id	The object Id of the replciation manage which controls the replication domain.
source-sys-id	For the source cluster on which this Volume-Pair resides, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
source-vol-size	The size of the Volume on the replication source side (in KB)
source-volume-id	Volume Id in the source cluster
source-volume-pair-id	The Volume pair Id in the source cluster.
source-xms-id	For the source cluster on which this Volume-Pair resides, the Id of the XMS.
target-sys-id	For the target cluster on which this Volume-Pair resides, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
target-vol-size	The size of the Volume on the replication target side (in KB).
target-volume-id	The Volume Id in target cluster.
target-volume-pair-id	The Volume pair Id in the target cluster
target-xms-id	For the target cluster on which this Volume-Pair resides, the Id of the XMS.
volume-pair-consistency-state	The state of this Volume-Pair from the local XMS. The state is based on property values in each Volume-Pair in the each Cluster. The state of the combined Volume-Pairs is inconsistent in the following cases: - only one Volume-Pair with the pairing label was discovered (i.e., no pair in one of the clusters) - two Volume-Pair with the same pairing label were discovered, but there is a discrepancy in one or more persistent properties which determine the identity of an object as recorded in both clusters. Values: - unknown - consistent - inconsistent - inconsistent_roles

Example Request

```
GET /api/json/v3/types/volume-pairs/ 8663a701b80a4c1ea5be6e7359bcb37a HTTP/1.1
Host: vxms-xbrickdrm1319.xiodrm.lab.emc.com
```

Volume Pairs

Authorization: Basic *****
 Cache-Control: no-cache

Response

```
content':
{
  'certainty': 'ok',
  'guid': '8663a701b80a4c1ea5be6e7359bcb37a',
  'index': 1,
  'name': 'vp-xbrickdrm1318-xbrickdrm1319-1320-1_1',
  'obj-severity': 'information',
  'replication-session-pairing-label-id':
['b6008c8377084a5cb74229a85b43d9fe',
  'NR_CG_xbrickdrm1318_0_2018-08-21-14:45:21-xbrickdrm1319-
1320_',
    1],
  'rm-id': ['bb56ce4cdfb6420eb6fd6147968988dd', 'rm', 1],
  'source-sys-id': ['3c0060fe31ec4fd9b014bcf458da0907',
    'xbrickdrm1318',
    1],
  'source-vol-size': '5242880',
  'source-volume-id': ['89d7e1508c234d75b4b8ec36970c47b1',
    'NR_VOLS_2018-08-21-14:45:17:397117_2',
    1],
  'source-volume-pair-id': ['e056aee8865042b8bf8bd5fa201f8f7b',
    'vp-xbrickdrm1318-xbrickdrm1319-1320-1_1',
    1],
  'source-xms-id': ['67e9e1b5743f45dc815e9ab844a682d7',
    'vxms-xbrickdrm1318',
    0],
  'target-sys-id': ['a582d4acd74341eebc206ccf35e4dec2',
    'xbrickdrm1319-1320',
    1],
  'target-vol-size': '5242880',
  'target-volume-id': ['feb7f6c28b404eb890a2938abb26353e',
    'NR_VOLS_2018-08-21-14:45:17:397117_2',
    1],
  'target-volume-pair-id': ['c6271999da53468eb2f0f1392698f9d7',
    'vp-xbrickdrm1318-xbrickdrm1319-1320-1_1',
    1],
  'target-xms-id': ['ce10751e174f4cceb663b0f566a92190',
    'vxms-xbrickdrm1319',
    1],
  'volume-pair-consistency-state': 'consistent',
  'volume-pair-pairing-label-id':
['8663a701b80a4c1ea5be6e7359bcb37a',
    'vp-xbrickdrm1318-xbrickdrm1319-1320-1_1',
    1]
},
"links": [
{
  "guid": "8663a701b80a4c1ea5be6e7359bcb37a",
  "href": "https://vxms-
xbrickdrm1319/api/json/v3/types/volume-pairs/8663a701b80a4c1ea5be6e7359bcb37a",
  "rel": "self"
}
```


Volume Pairs

Adding Volume Pairs to Remote Protection Sessions

POST /api/json/v3/types/volume-pairs

This command (POST /api/json/v3/types/volume-pairs) enables you to add Volume-Pairs to a Remote Protection Session.

The prerequisites for executing this command are:

1. The Volumes must exist on both the source and target clusters.
2. The Remote Protection Session must be terminated.
3. The source Volume must be added to source Remote Protection Session Consistency Group.
4. The target Volume must be added to the target Remote Protection Session Consistency Group.

After the prerequisites are completed, add the Volume-Pair using the volume-pairs command (POST /api/json/v3/types/volume-pairs).

Finally, the Remote Protection Session can be started.

Note: For an example of adding a Volume-Pair to a Remote Protection Session, see [Add a Volume Pair to a Remote Protection Session \(Workflow\)](#) on page 766.

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
protection-session-id	The Id or name of the Replication Session.	Yes
source-cluster-id	The Id of the source cluster on which the source Volume resides.	Yes
source-vol-id	The Id of the source Volume.	Yes
target-cluster-id	The Id of the target cluster on which the target Volume resides.	Yes
target-vol-id	The Id of the target Volume.	Yes
source-XMS-name	The name of the source XMS.	No
target-XMS-name	The name of the target XMS.	No
volume-pair-name	The name part of the Volume-Pair. This name must be unique in the Remote Protection Session.	No

Example

```
POST /api/json/v3/types/volume-pairs HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache

{"source-cluster-id":"xbrickdrm1648","target-cluster-id":"xbrickdrm1652","protection-session-id":"PR-CG-Session","source_vol_id":"PRD04","target_vol_id":"PRD04"}
```

Response

```
{
  "links": [
    {
      "guid": "f8cc1c99acce4738901de3d4901b3f46",
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/volume-pairs/f8cc1c99acce4738901de3d4901b3f46",
      "rel": "self"
    }
  ]
}
```

Volumes Savings

Viewing the List of Volumes Scanned for Savings Metrics

GET /api/json/v3/types/volumes-savings

This command (GET /api/json/v3/types/volumes-savings) displays the list of all Volumes scanned for savings metrics.

Example request

```
GET /api/json/v3/types/volumes-savings HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "volumes": [
    {
      "href": "https://vxms-xbrick1652/api/json/v3/types/volumes/b7997f509ff042eb8528f494deaf171a",
      "name": "DB01"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrick1652/api/json/v3/types/volumes-savings/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of a Volume’s Savings Metrics

GET /api/json/v3/types/volumes-savings?full=1&filter=<parameter (vol-id-guid)>&prop=<property_name>

This command (GET /api/json/v3/types/volumes-savings?full=1&filter=<parameter (vol-id-guid)>&prop=<property_name>) displays the saving metrics of the specified Volume.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
vol-id-guid	A unique identifier for the Volume.	Yes
prop	The savings metrics properties, including: - data-reduction-ratio - calculate-savings-timestamp - snapgrp-unique-physical-space Note: Each property requires a separate URL query parameter (see the Example Request).	Select at least one of the following: - data-reduction-ratio - calculate-savings-timestamp - snapgrp-unique-physical-space

Volumes Savings

Example request

```
GET /api/json/v3/types/volumes-
savings?full=1&filter=guid:eq:b7997f509ff042eb8528f494deaf171a&prop=data-
reduction-ratio&prop=calculate-savings-timestamp&prop=snapgrp-unique-physical-
space' HTTP/1.1
Host: vxms-xbrick1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "volumes": [
    {
      "index": 1,
      "data-reduction-ratio": 10.0202020202,
      "name": "DB01",
      "calculate-savings-timestamp": "1529937586",
      "snapgrp-unique-physical-space": "0",
      "href": "https://vxms-
xbrickdr1652/api/json/v3/types/volumes/b7997f509ff042eb8528f494deaf171a",
      "guid": "b7997f509ff042eb8528f494deaf171a"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdr1652/api/json/v3/types/volumes-
savings/",
      "rel": "self"
    }
  ]
}
```


X-Bricks

Viewing the List of X-Bricks

GET /api/json/v3/types/bricks

This command (GET /api/json/v3/types/bricks) displays the list of all X-Bricks.

Example request

```
GET /api/json/v3/types/bricks HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "bricks": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/bricks/b066f0af84f8475b9df3bf46b740b097",
      "name": "X1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/bricks/f3c3795c03e64b369e6068b1c86cbb8e",
      "name": "X1",
      "sys-name": "xbrickdrm1652"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/bricks/",
      "rel": "self"
    }
  ]
}
```

X-Bricks

Viewing the Details of an X-Brick

GET /api/json/v3/types/bricks/<parameter (brick-guid) or brick-index or ?name= brick-name>

This command (GET /api/json/v3/types/bricks/<parameter [brick-guid or brick-index or ?name= brick-name]>) displays details of the selected X-Brick.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
brick-guid	A unique identifier for the X-Brick.	Select one of the following: • brick-guid • brick-index • brick-name
brick-index	The index of the X-Brick.	
brick-name	The name of the X-Brick.	
• cluster-index - OR • cluster-name	The Cluster index or name of the X-Brick.	• No – for single cluster configurations or if brick-guid is specified • Yes – for multiple cluster configurations and if the brick-guid is not specified

Output Parameter	Description
brick-guid	X-Brick's GUID (globally unique Identifier). Hardwired in the physical X-Brick and never changes. Once the Storage Controller is installed by the XMS, it is specified and validated to be equal to the hardwired X-Brick GUID. X-Brick GUID and X-Brick object GUID are not necessarily the same. Implementation can assign the X-Brick object a different object GUID than that of the hardwired X-Brick GUID.
brick-id	For this X-Brick, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.

Output Parameter	Description
brick-state	X-Brick's current state
configured-num-of-ssds	The total number of SSDs in this X-Brick, including SSDs temporarily removed due to the FRU. This number is updated by SYM if an add-ssd is accepted during a bring-up, scale-up, or cluster expansion.
guid	The object GUID identifier of the X-Brick.
index	The X-Brick index number as defined by the XMS upon its creation (a unique positive number)
index-in-system	The X-Brick's index
jbod-list	DAE's number of controller objects and a list of their object IDs. Should be two Storage Controllers per DAE.
name	X-Brick's name
node-list	List of the X-Brick's Storage Controllers
num-of-nodes	X-Brick's total number of Storage Controllers
num-of-ssds	The X-Brick's total number of SSDs
obj-severity	X-Brick severity, based on severity level of current Alerts (Alerts still uncleared) for this X-Brick Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
rg-id	For the DPG associated with this X-Brick, a tuple array containing the following parameters (in the following order): the DPG's object GUID identifier, the DPG name, and the DPG index..
ssd-slot-array	Information on whether the X-Brick's Slots are empty, what SSDs are detected, etc. Information is updated both for SSDs with an SSD object and for SSDs without one. Information may be slightly inaccurate (reflects state as it was 10-20 seconds earlier).
sys-id	For the cluster to which this X-Brick belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.

X-Bricks

Output Parameter	Description
tag-list	List of Tags
ups-list	List of BBUs attached to the X-Brick. List is of size 1 for multiple X-Brick clusters and of size 2 for a single X-Brick cluster.
xms-id	For the XMS to which this X-Brick belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

Example Request

```
GET /api/json/v3/types/bricks/f67e336d91eb4ad48618f92e7d26752d HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: Managing locked Volumes is available in X2 clusters only.

X-Bricks

```

{
  "content": {
    "node-list": [
      [
        "48d8367ab76e4df6b24c43d14e1c4d02",
        "X1-SC1",
        1
      ],
      [
        "3a1b956d025940f598944da321026f81",
        "X1-SC2",
        2
      ]
    ],
    "configured-num-of-ssds": 18,
    "xms-id": [
      "5e9b962c7d844ab684d5252945792cb7",
      "xms",
      1
    ],
    "brick-guid": "0469c88c45a145bfa180e193cecf33ba",
    "jbod-list": [
      [
        "3ab8d679732e441e944ef78a37251806",
        "X1-DAE",
        1
      ]
    ],
    "obj-severity": "major",
    "brick-state": "in_sys",
    "num-of-ssds": 18,
    "tag-list": [],
    "sys-index": 1,
    "sys-name": "xbrickdrm1179",
    "rg-id": [
      "cf1666d28d074737bc93df1b93cefb1c",
      "X1-DPG-1",
      1
    ],
    "guid": "f67e336d91eb4ad48618f92e7d26752d",
    "index-in-system": 1,
    "index": 1,
    "num-of-nodes": 2,
    "name": "X1",
    "brick-id": [
      "f67e336d91eb4ad48618f92e7d26752d",
      "X1",
      1
    ],
    "sys-id": [
      "ed59e939575c48a2bb25554b08732430",
      "xbrickdrm1179",
      1
    ],
    "ssd-slot-array": [
      0,

```

```

        "resident_ssd",
        "none",
        null,
        "ec90cdddefc949cd8f46eabd2d935973",
        "wwn-0x5000cca06c4b86b8",
        "HGST      HUSMR119CLAR1920",
        "1875902464",
        "none"
    ],
    [
        1,
        "resident_ssd",
        "none",
        null,
        "da9adfb037e04debb106f742afc5f3e4",
        "wwn-0x5000cca06c4a3b64",
        "HGST      HUSMR119CLAR1920",
        "1875902464",
        "none"
    ]
],
    "ups-list": [],
    "brick-name": "X1",
    "brick-index": 1
},
"links": [
    {
        "guid": "f67e336d91eb4ad48618f92e7d26752d",
        "href": "https://vxms-
xbrickdrm1179/api/json/v3/types/bricks/f67e336d91eb4ad48618f92e7d26752d",
        "rel": "self"
    }
]
}

```

XEnvs

Viewing the List of XEnvs

GET /api/json/v3/types/xenvs

This command (GET /api/json/v3/types/xenvs) displays the list of XEnvs.

Example request

```
GET /api/json/v3/types/xenvs HTTP/1.1
Host: vxms-xbrickdrm1652.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "xenvs": [
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/xenvs/986041197bcc42578d6455d320a97fd2",
      "name": "X1-SC1-E1",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/xenvs/f74729901c0c425abfcbbbd0b3b0aa93",
      "name": "X1-SC1-E1",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/xenvs/2f82373e711b466ca104dedfa8ab0493",
      "name": "X1-SC1-E2",
      "sys-name": "xbrickdrm1652"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/xenvs/43e1903ace454a48b3944e92550b8cc5",
      "name": "X1-SC1-E2",
      "sys-name": "xbrick224-rename"
    },
    {
      "href": "https://vxms-xbrickdrm1652/api/json/v3/types/xenvs/51aabcaeb544df2a1b96d23ef2a482b",
      "name": "X1-SC2-E1",
      "sys-name": "xbrick224-rename"
    }
  ]
}
```



```
{
  "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/xenvs/59db06f3578a481e9621f5a7be0a74c3",
  "name": "X1-SC2-E1",
  "sys-name": "xbrickdrm1652"
},
{
  "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/xenvs/3ee259998e4e4cda87d62df1baa6540f",
  "name": "X1-SC2-E2",
  "sys-name": "xbrick224-rename"
},
{
  "href": "https://vxms-
xbrickdrm1652/api/json/v3/types/xenvs/cc6f37ef5f7248f68b6a66ea67c2b916",
  "name": "X1-SC2-E2",
  "sys-name": "xbrickdrm1652"
}
],
"links": [
  {
    "href": "https://vxms-xbrickdrm1652/api/json/v3/types/xenvs/",
    "rel": "self"
  }
]
}
```

XEnvs

Viewing the Details of an XEnvs

GET /api/json/v3/types/xenvs/<parameter (xenvs-guid or xenvs-index or ?name= xenvs-name)>

This command (GET /api/json/v3/types/xenvs/<parameter [xenvs-guid or xenvs-index or ?name= xenvs-name]>) displays details of the selected XEnvs.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
xenvs-guid	A unique identifier for the XEnvs.	Select one of the following: • xenvs-guid • xenvs-index • xenvs-name
xenvs-index	The index of the XEnvs.	
xenvs-name	The name of the XEnvs.	
• cluster-index - OR • cluster-name	The Cluster index or name of the XEnvs.	• No – for single cluster configurations or if xenvs-guid is specified • Yes – for multiple cluster configurations and if the xenvs-guid is not specified

Output Parameter	Description
brick-id	For the X-Brick to which this XEnv belongs, a tuple array containing the following parameters (in the following order): the X-Brick's object GUID identifier, the X-Brick name, and the X-Brick index.
brick-index	The X-Brick's physical index number containing the Storage Controller within the cluster. The lowest is number 1.
brick-name	The name of the X-Brick.
cpu-usage	Percentage of XEnv's CPU usage
csid	Unique clustering Id for XEnvs internal messaging. Note: This parameter is xenscsid for URLs without an explicit version.

Output Parameter	Description
index	XEnv's index number as defined by XMS upon its creation (a unique positive number)
name	XEnv's name as defined by the XMS upon its creation (a unique name)
node-guid	GUID (Globally Unique Identifier) hardwired in the physical Storage Controller. Once it is installed, it never changes.
node-id	For the node to which this XEnv belongs, a tuple array containing the following parameters (in the following order): the node's object GUID identifier, the node name, and the node index.
node-index	The physical index of the node within the brick. The bottom node is number 1.
node-name	The physical index of the node within the X-Brick. The bottom node is number 1.
num-of-mdls	The number of modules that belong to this XEnv
obj-severity	XEnv's severity, based on severity level of current Alerts (Alerts still uncleared) for this XEnv Values: • <code>clear</code> - No Alerts exist for this entity. • <code>information</code> - The highest severity for this entity and all contained objects is information. • <code>minor</code> - The highest severity for this entity and all contained objects is minor. • <code>major</code> - The highest severity for this entity and all contained objects is major. • <code>critical</code> - The highest severity for this entity and all contained objects is critical.
sys-id	For the cluster to which this XEnvs belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
tag-list	List of Tags
xenv-id	XEnv's index number
xenv-state	Health state of the XEnv
xms-id	For the XMS to which this XEnv belongs, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.

XEnvs

Example Request

```
GET /api/json/v3/types/xenvs/a47a04638947450b83d56548b27152f9 HTTP/1.1
Host: vxms-xbrickdrm487.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: Managing locked Volumes is available in X2 clusters only.

```
{
  "content": {
    "cpu-usage": 0,
    "xms-id": [
      "7a4a49dc54b34170a7d448f8d392c174",
      "xms",
      1
    ],
    "obj-severity": "information",
    "sys-index": 2,
    "csid": 13,
    "node-index": 2,
    "brick-index": 1,
    "guid": "a47a04638947450b83d56548b27152f9",
    "sys-id": [
      "3139f69b7b0e4b21a013bf1c45d4fb00",
      "xbrickdrm847",
      2
    ],
    "num-of-mdls": 3,
    "index": 4,
    "xenv-state": "active",
    "name": "X1-SC2-E2",
    "xenv-id": [
      "a47a04638947450b83d56548b27152f9",
      "X1-SC2-E2",
      4
    ],
    "brick-id": [
      "e2ee8c88151b491489e9ca86e37658b7",
      "X1",
      1
    ],
    "node-name": "X1-SC2",
    "brick-name": "X1",
    "node-id": [
      "872de033f3964405b4dce7513c5996e6",
      "X1-SC2",
      2
    ],
    "sys-name": "xbrickdrm847"
  },
  "links": [
    {
      "guid": "a47a04638947450b83d56548b27152f9",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/xenvs/a47a04638947450b83d56548b27152f9",
      "rel": "self"
    }
  ]
}
```

XMS

Viewing the List of XMS

GET /api/json/v3/types/xms

This command (GET /api/json/v3/types/xms) displays a list of the XMSs.

Example request

```
GET /api/json/v3/types/xms HTTP/1.1
Host: vxms-xbrickdrm1648.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

```
{
  "xms": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/xms/36b0474eca4240cca658740c198d0faf",
      "name": "xms"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm1648/api/json/v3/types/xms/",
      "rel": "self"
    }
  ]
}
```

Viewing the Details of an XMS

GET /api/json/v3/types/xms/<parameter (xms-guid or xms-index or ?name= xms-name)>

This command (GET /api/json/v3/types/xms/<parameter [xms-guid or xms-index or ?name= xms-name]>) displays details of the XMS.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
xms-guid	A unique identifier for the XMS.	Select one of the following: - xms-guid - xms-index - xms-name
xms-index	The index of the XMS.	
xms-name	The name of the XMS.	

Output Parameter	Description
advisory-notifications-processing	Indicates whether the advisory query and notification feature in XMS is active. Values: - enabled – The feature is active. - disabled – The feature is not active. Note: This parameter is not supported in the current RESTful API version. Support for this parameter is planned for an upcoming version.
allow-empty-password	User account can have a blank password when true.
appsync-mode	Indicates whether Appsync view is enabled in the XMS web interface. Values: - enabled - disabled
avg-latency	The weighted average latency for reads and writes of all block sizes.
build	The number of the XMS build
bw	The aggregated value of total real-time read and write bandwidth for all clusters managed by the XMS, measured in MB per second
bw-by-block	The aggregated value of bandwidth for all clusters managed by the XMS

XMS

Output Parameter	Description
cloud-iq-reporting	Indicates whether XMS reporting to CloudIQ is enabled for integration with Dell EMC CloudIQ™. Values: - true – Dell EMC CloudIQ™ is enabled - false – Dell EMC CloudIQ™ is disabled
cpu	The current XMS's CPU utilization, in percent
datetime	The datetime string contains the desired date and/or time in ISO8601 format
days-in-num-event	Days in Event Log (the number of days of records that are currently in the log)
db-version	The number of the database
default-user-inactivity-timeout	The XMS's default timeout period. The XMS logs the user out when a timeout period is not set.
disk-space-secondary-utilization-level	Disk space secondary utilization level. Measures XMS's aggregated value of capacity monitoring.
disk-space-utilization-level	Monitors the aggregated amount of free disk space on the XMS system for the root partition. An Alert is triggered when the disk utilization of the root portion exceeds the threshold percentage.
dns-servers-list	A list of DNS servers managed by the XMS.
guid	The object GUID identifier of the XMS.
index	XMS's unique index number as defined by XMS upon its creation
iops	The aggregated value of total read and write real-time input/output operations per second from all clusters managed by the XMS
iops-by-block	Input/output per second by block (current aggregated input/output per second, handled by all clusters managed by the XMS)
ip-version	The IP version used by the XMS for both southbound (towards clusters) and northbound
logs-size	The aggregated log size of all clusters managed by the XMS, measured in Kbytes
max-num-of-advisory-notices	The maximum number of Advisory Notices in this XMS. Note: This parameter is not supported in the current RESTful API version. Support for this parameter is planned for an upcoming version.
max-repeating-alert	The threshold to declare an alert as repeating, where the threshold applies if the same alert appears for the same object during a 24 hour period.

Output Parameter	Description
max-recs-in-event-log	The aggregated value of maximum records in the Event Logs of all clusters managed by the XMS
max-xms-clusters	The maximum number of clusters that can be managed by the XMS.
max-xms-objects-per-tag	The maximum number of objects per tag for the XMS.
max-xms-tags-per-object	The maximum number of tags per object for the XMS.
max-xms-volumes	The maximum number of Volumes that can be managed by the XMS.
memory-utilization-level	Monitors the aggregated free memory on all clusters managed by the XMS
mgmt-interface	The physical network interface used by the XMS to communicate with the clusters
min-tls-version	The minimal TLS version supported by this XMS. The default value is 1.0. The other values include: 1.0, 1.1, 1.2.
mode	Determines whether NTP is automatically or manually configured.
name	Name of the XMS
node-list	List of the X-Brick's Storage Controllers
ntp-servers	List of NTP servers
num-of-bricks	The number of X-Brick objects belonging to this XMS.
num-of-igs	The aggregated value of Initiator Groups that currently exist in all clusters managed by the XMS
num-of-initiators	The number of initiators existing in this XMS.
num-of-iscsi-routes	The aggregated amount of iSCSI routes for all clusters managed by the XMS.
num-of-nodes	The number of nodes managed by the XMS.
num-of-systems	The number of clusters managed by the XMS.
num-of-user-accounts	The number of user accounts managed by the XMS.

XMS

Output Parameter	Description
obj-severity	The XMS's severity, based on severity level of current Alerts (Alerts still uncleared) for this XMS. Values: • clear - No Alerts exist for this entity. • information - The highest severity for this entity and all contained objects is information. • minor - The highest severity for this entity and all contained objects is minor. • major - The highest severity for this entity and all contained objects is major. • critical - The highest severity for this entity and all contained objects is critical.
overall-efficiency-ratio	The aggregated value of the ratio of provisioned Volume capacity to the cluster's actual used physical capacity.
ram-total	Total available RAM for all clusters managed by the XMS
ram-usage	RAM usage for all clusters managed by the XMS
rd-bw	The aggregated value of real-time read bandwidth from all clusters managed by the XMS.
rd-bw-by-block	The aggregated value of bandwidth handled by all clusters managed by the XMS.
rd-iops	IOPS of small input/output operations per second
rd-iops-by-block	The aggregated value of aggregated input/output per second handled by all clusters managed by the XMS
rd-latency	XMS's total real-time average latency of read operations, measured in μ s
recs-in-event-log	The aggregated value of records that are currently in the log for all clusters managed by the XMS
restapi-protocol-version	Exposes the supported RESTful API version
server-name	The fully qualified name of the XMS server
ssd-space-in-use	The actual number of Kbytes written by the user to the SSD. The Kbyte calculation occurs after compression. This is the actual physical consumption of blocks.
sw-version	XMS software version. This version should be identical to the cluster's software version, unless it is undergoing a special process (e.g. upgrade).

Output Parameter	Description
sys-id	For the cluster to which this XMS belongs, a tuple array containing the following parameters (in the following order): the Cluster object GUID identifier, the Cluster name, and the Cluster index. The tuple array may be empty (omitted) if only one cluster is defined.
sys-index	The physical index of the system to which the object belongs.
sys-name	The name of the cluster. This may be omitted if only one cluster is defined.
thin-provisioning-savings	The aggregated value of percentage of Volume capacity not in use
top-n-cgs-by-bw	The top nine Consistency Groups by bandwidth.
top-n-cgs-by-iops	The top nine Consistency Groups by IOPS.
top-n-cgs-by-latency	The top nine Consistency Groups by latency.
top-n-igs-by-bw	The top nine Initiator-Groups by bandwidth.
top-n-igs-by-iops	The top nine Initiator-Groups by IOPS.
top-n-volumes-by-bw	The top nine Volumes by bandwidth.
top-n-volumes-by-iops	The top nine Volumes by IOPS.
top-n-volumes-by-latency	The top nine Volumes by latency.
uptime	The aggregated number of seconds passed since the XMS was last rebooted
version	The installed XtremIO XMS version
wr-bw	The aggregated value of total real-time write bandwidth of all clusters managed by the XMS, in MB per second
wr-bw-by-block	The aggregated value of current bandwidth for all clusters managed by the XMS, used to get a Snapshot of the aggregated totals by block size
wr-iops	The aggregated value of total write real-time input/output operations per second from all clusters managed by the XMS
wr-iops-by-block	The aggregated value of input/output per second handled by all clusters managed by the XMS
wr-latency	Cluster's aggregated value of total real-time average latency of write operations, measured in μ s
wrong-cn-in-csr	Triggers an Alert if the default CSR (Certificate Signing Request) contains CN which is not the XMS's FQDN.
xms-gw	XMS's default gateway IP address
xms-id	For this XMS, a tuple array containing the following parameters (in the following order): the XMS object GUID identifier, the XMS name, and the XMS index.
xms-ip	IP address of the XMS

XMS

Output Parameter	Description
xms-ip-sn	XMS IP address and subnetmask. The XMS IP address is optional. It is not required if this command is only used to update the Storage Controller's IP or IPMI addresses.
xms-num-of-volumes-level	A percentage indicating the number of Volumes managed by the XMS compared to the maximum number of Volumes that the XMS can manage. This percentage is calculated as num-of-vols divided by max-xms-Volumes and is rounded to the nearest integer.
xms-server-ldap-authentication	Use to enable or disable the XMS server configuration to authenticate against LDAP server. Values: • enabled • disabled

Example Request

```
GET /api/json/v3/types/xms/5e9b96c7d844ab684d5252945792cb7 HTTP/1.1
Host: vxms-xbrick919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

Response

Note: Managing locked Volumes is available in X2 clusters only.

XMS

```

{
  "content": {
    "wr-latency": "0",
    "top-n-volumes-by-bw": [],
    "obj-severity": "major",
    "wr-iops-by-block": "0",
    "datetime": "2018-08-24 17:27:24 IDT",
    "max-num-of-advisory-notices": null,
    "rd-bw-by-block": "0",
    "iops": "0",
    "logs-size": 24378299,
    "guid": "5e9b962c7d844ab684d5252945792cb7",
    "top-n-cgs-by-latency": [],
    "max-xms-objects-per-tag": 32768,
    "wr-bw-by-block": "0",
    "server-name": "vxms-xbrickdrm1179.xiodrm.lab.emc.com",
    "num-of-systems": 1,
    "rd-iops-by-block": "0",
    "xms-gw": "10.102.64.1",
    "max-xms-tags-per-object": 10,
    "disk-space-secondary-utilization-level": "healthy",
    "overall-efficiency-ratio": "13.2035012053",
    "bw-by-block": "0",
    "top-n-igs-by-bw": [],
    "num-of-igs": 58,
    "rd-bw": "0",
    "sw-version": "6.2.0-80",
    "appsync-mode": false,
    "recs-in-event-log": 10740,
    "cloudiq-reporting": true,
    "top-n-cgs-by-bw": [],
    "disk-space-utilization-level": "healthy",
    "sys-name": "",
    "wr-iops": "0",
    "memory-utilization-level": "healthy",
    "xms-ip-sn": "255.255.248.0",
    "num-of-user-accounts": 11,
    "min-tls-version": "1.0",
    "name": "xms",
    "wrong-cn-in-csr": true,
    "top-n-volumes-by-iops": [],
    "mode": "automatic",
    "ntp-servers": [
      "10.102.56.250"
    ],
    "top-n-igs-by-latency": [],
    "advisory-notifications-processing": "enabled",
    "node-list": [
      [
        "48d8367ab76e4df6b24c43d14e1c4d02",
        "X1-SC1",
        1
      ],
      [
        "3a1b956d025940f598944da321026f81",
        "X1-SC2",
        2
      ]
    ]
  }
}

```

```

    ],
    "max-recs-in-event-log": 2000000,
    "top-n-igs-by-iops": [],
    "index": 1,
    "uptime": "16 days, 23:09:39.080000",
    "db-version": "6.2.0",
    "num-of-iscsi-routes": 1,
    "allow-empty-password": false,
    "ssd-space-in-use": "2270670890",
    "xms-num-of-volumes-level": "healthy",
    "top-n-volumes-by-latency": [],
    "ip-version": "ipv4",
    "version": "6.2.0",
    "build": "80",
    "ram-total": "8061248",
    "dns-servers-list": [
        "10.102.56.250",
        "10.103.224.89"
    ],
    "max-repeating-alert": 10,
    "xms-id": [
        "5e9b962c7d844ab684d5252945792cb7",
        "xms",
        1
    ],
    "xms-ip": "10.102.65.77",
    "bw": "0",
    "default-user-inactivity-timeout": 10,
    "max-xms-clusters": 8,
    "thin-provisioning-savings": "57",
    "avg-latency": "0",
    "ram-usage": "1798896",
    "num-of-bricks": 1,
    "rd-latency": "0",
    "days-in-num-event": 8,
    "mgmt-interface": "eth0",
    "iops-by-block": "0",
    "xms-server-ldap-authentication": "disabled",
    "top-n-cgs-by-iops": [],
    "restapi-protocol-version": "3.1",
    "max-xms-volumes": 32768,
    "rd-iops": "0",
    "wr-bw": "0",
    "cpu": 44.76
  },
  "links": [
    {
      "guid": "5e9b962c7d844ab684d5252945792cb7",
      "href": "https://vxms-
xbrickdrm1179/api/json/v3/types/xms/5e9b962c7d844ab684d5252945792cb7",
      "rel": "self"
    }
  ]
}

```

XMS

Renaming a XMS

PUT /api/json/v3/types/xms/<parameter (xms-guid or xms-index or ?name= xms-name)>

This command (GET /api/json/v3/types/xms/<parameter [xms-guid or xms-index or ?name= xms-name]>) enables you to rename an XMS.

For this command, input parameters (as described in the following table), should be entered in the URL.

Input Parameter	Description	Mandatory
xms-guid	A unique identifier for the XMS.	Select one of the following: • xms-guid • xms-index • xms-name
xms-index	The index of the XMS.	
xms-name	The name of the XMS.	

For this command, input parameters (as described in the following table), should be entered in the body.

Input Parameter	Description	Mandatory
new-name	The new cluster. The maximum length is 64 characters.	Yes
xms-id	The Id of the XMS object.	No
ig-id	The Id of the IG object.	No
initiator-id	The Id of the initiator object.	No
new-caption	The new cluster caption.	No
scheduler-id	The Id of the scheduler object.	No
snapgrp-id	The Id of the Snapshot-Group object.	No
snapset-id	The Id of the Snapshot-Set object.	No
sys-id	The Id of the system object.	No
tag-id	The Id of the tag object.	No
tar-id	The Id of the target object.	No
tg-id	The Id of the TG object.	No
user-id	The Id of the user account object.	No
vol-id	The Id of the Volume object.	No

Input Parameter	Description	Mandatory
xms-id	The Id of the XMS object.	No

Example

```
PUT /api/json/v3/types/xenvs/a47a04638947450b83d56548b27152f9 HTTP/1.1
Host: vxms-xbrickdrm919.xiodrm.lab.emc.com
Authorization: Basic *****
Cache-Control: no-cache
```

```
{"new-name":"XMS.test.01"}
```

Response

Note: The successful completion of this command returns no response.

Appendix A – RESTful API Versions

RESTful API Version 2.0 New Features and Enhancements

Main Enhancements

New Features

The RESTful API Version 2.0 includes the following new features:

- ♦ New REST Object Support
- ♦ New Snapshot Operations
- ♦ New Tags Feature (Folders Feature Replacement)

Feature Enhancements

The RESTful API Version 2.0 includes the following enhancement:

- ♦ Enhanced Snapshots Management

New REST Object Support

XtremIO RESTful API Version 2.0 introduces newly-supported objects which were previously only supported via the CLI.

The newly-supported objects in RESTful API Version 2.0 are:

♦ Alerts	♦ Local Disks
♦ Alert Definitions	♦ Object Performance
♦ BBUs	♦ Schedulers
♦ Consistency Groups	♦ Slots
♦ Consistency Group Volumes	♦ Snapshot Sets
♦ DAEs	♦ SNMP Notifier
♦ DAE Controllers	♦ Storage Controller PSUs
♦ DAE PSUs	♦ SYSLOG Notifier

- ♦ Email Notifiers
- ♦ InfiniBand Switches
- ♦ LDAP Configurations
- ♦ Tags
- ♦ User Accounts
- ♦ XMS

New Snapshot Operations

XtremIO has introduced the following new Snapshot operations:

- ♦ Snapshots can be taken on multiple object types (Volumes, Consistency Groups and Snapshot Sets).
- ♦ Snapshots can be used to restore data when the source of the Snapshot has been compromised.
- ♦ Snapshots (local backup copies) can be used to restore a Volume, in case of logical data corruption.
- ♦ Development and Test, DWH and Real-Time Analytics environments management (Refresh).
- ♦ Snapshots can be used to create copies, and then to refresh the copies with more current data.

Refresh

XtremIO enables taking Snapshots on an existing Volume, Volume list, Consistency Group or Snapshot Set. It also enables refreshing the Snapshot data to that of a source Volume's current state and at a later stage, without the need to explicitly perform LUN mapping to provide access for the newly refreshed Snapshot data. Initial mapping of the 'to-be-refreshed' Snapshot needs to be performed.

Appendix A – RESTful API Versions

The following examples are use cases, supported by Refresh:

- ◆ Backup of production environment/DWH/Real-Time Analytics: A Snapshot Set, taken of a Consistency Group with production Volumes, is mapped to a different host at a certain point in time. It is then refreshed periodically with data from the source Consistency Group (with production Volumes).
- ◆ Refresh 'Development and Test' environments from a 'master copy' made from the production environment: The 'master copy' is a Snapshot Set taken at a certain point in time from the Consistency Group with production Volumes. The Development and Test environment is a Snapshot Set that was initially taken from the production Consistency Group or the initial 'master copy', and is mapped to a different host. The Development and Test environment is refreshed periodically from a new master copy that was created from the production environment.

Restore

The Restore feature enables you to restore a Volume for an immutable local Snapshot copy. This is required if a logical corruption is encountered on the production server. The production server can then be restored with an uncorrupted local.

New Tags Feature (Folders Feature Replacement)

XtremIO Storage Array Versions 4.0 and 4.0.1 introduced 'Tag' objects. Tags are used for assigning named (GUI) identifiers to any object type within the cluster, bringing enhanced object filtering and isolation capabilities for improved management and monitoring of the XtremIO clusters.

Tags are created and managed per object type. Therefore, to tag both Volumes and Initiator Groups with a specific Tag name (e.g. Production), you should create a Tag with the same name for both Volumes and Initiator Groups.

Tags are generic and supported across all cluster object types, when creating an object of a certain type, the Tag is assigned a prefix with the object-type. For example, if you create a Volume Tag named "Production", the official name of the Tag will be "/volume/Production".

Taggable Objects

The following objects can be tagged:

- ♦ Battery Backup Units
- ♦ Clusters
- ♦ Consistency Groups
- ♦ DAEs
- ♦ Data Protection Groups
- ♦ InfiniBand Switches
- ♦ Initiator Groups
- ♦ Initiators
- ♦ Local Disks
- ♦ Schedulers
- ♦ Snapshot Sets
- ♦ SSDs
- ♦ Storage Controllers
- ♦ Targets
- ♦ Volumes
- ♦ X-Bricks

Enhanced Snapshots Management

XtremIO offers the following tools for managing Snapshots and optimizing their usability:

- ♦ [Consistency Groups](#)
- ♦ [Snapshot Sets](#)
- ♦ [Read-Only Snapshots](#)
- ♦ [Scheduler](#)

Consistency Groups

Consistency Groups (CG) are used to create a consistent image of a set of Volumes, usually used by a single application, such as a database. With XtremIO CGs, you can create a Snapshot of all Volumes in a group, using a single command. This ensures that all Volumes are created at the same time. Many operations that are applied on a single Volume can also be applied on a CG.

Snapshot Sets

A Snapshot Set is a point-in-time group of Snapshots that have been taken from a single Snapshot operation on a Volume, group of Volumes, Consistency Group, or on another Snapshot Set.

Snapshot Sets are not manageable. However, you can take a Snapshot on a Snapshot Set, and Volumes can be mapped to other host applications.

Appendix A – RESTful API Versions

Read-Only Snapshots

XtremIO Snapshots can be created either as writable (default) or as read-only, in order to provision for local backup and immutable copies. A Read-Only Snapshot can be mapped to an external host, such as a backup application. However, it is not possible to write to it. Once created as read-only, a Snapshot cannot be modified to be writeable.

Scheduler

The Scheduler can be used for local protection use cases. It can be applied to a Volume, a Consistency Group or a Snapshot Set. Each Scheduler can be defined to run at an interval of seconds, minutes or hours. Alternatively, a Scheduler can be set to run at a specific time of a specific day or days of a week. Each Scheduler has a retention policy, based on the number of copies the customer would like to hold or based on the age of the oldest Snapshot.

RESTful API Version 2.1 New Features and Enhancements

Main Enhancements

New Features

The RESTful API Version 2.1 includes the following new feature:

- ♦ New REST Object Support

Feature Enhancements

The RESTful API Version 2.1 includes the following enhancements:

- ♦ Enhanced Filtering Logic
- ♦ Enhanced Snapshot-Groups Management

Backward Compatibility

Compatibility Policy

RESTful API resources and any related representations are maintained in a backward compatible manner within the major release Version 2, wherever possible.

The following guidelines define the XtremIO RESTful API backward compatibility policy:

- ♦ Command names are maintained.
- ♦ Command authorizations are maintained. The number of users can be increased (but not reduced).
- ♦ No parameters are removed.
- ♦ Parameters names and types are maintained.
- ♦ New parameters may be added.
- ♦ The order of parameters in a response may vary.
- ♦ Object values (such as `name`) may change for any object type other than `enum`, for which new values may be added, but existing values are maintained.
- ♦ Any bugs in the RESTful API are fixed.

New REST Object Support

- ♦ Discover Initiators
`GET /api/json/v2/types/discover-initiators`
- ♦ Initiators Connectivity
`GET /api/json/v2/types/initiators-connectivity`
- ♦ Snapshot-Groups
`GET /api/json/v2/types/snapshot-groups`

Appendix A – RESTful API Versions

Enhanced Filtering Logic

- ♦ Added OR Logic to support OR logics between a selected parameters.
- ♦ Added filters:
 - ♦ Great than (gt)
 - ♦ Greater or equal to (ge)
 - ♦ Less than (lt)
 - ♦ Less than or equal to (le)
 - ♦ Like

Enhanced Snapshot-Groups Management

XtremIO offers enhanced Snapshot-Groups management for managing Snapshots and optimizing their usability. A Snapshot Group contains a root Volume which is the Volume explicitly added and all its associated Snapshots, including Snapshots of Snapshots. If the root Volume is deleted, the Snapshots remain constrained by that Snapshot Group.

Snapshot Groups are not manageable. However, you can a list Snapshot Groups and the details of a specific Snapshot Groups.

RESTful API Version 2.2 Enhancements

Main Enhancements

New Features

The RESTful API Version 2.2 does not introduce new features.

Feature Enhancements

The RESTful API Version 2.2 includes minor enhancements to existing functionality and bug fixes as described in the Backward Compatibility section below.

Backward Compatibility

Compatibility Policy

RESTful API resources and any related representations are maintained in a backward compatible manner within the major release Version 2, wherever possible.

The following guidelines define the XtremIO RESTful API backward compatibility policy:

- ♦ Command names are maintained.
- ♦ Command authorizations are maintained. The number of users can be increased (but not reduced).
- ♦ No parameters are removed.
- ♦ Parameters names and types are maintained.
- ♦ New parameters may be added.
- ♦ The order of parameters in a response may vary.
- ♦ Object values (such as `name`) may change for any object type other than `enum`, for which new values may be added, but existing values are maintained.
- ♦ Any bugs in the RESTful API are fixed.

RESTful API Version 2.3 New Features and Enhancements

Main Enhancements

New Features

The RESTful API Version 2.3 includes the following new feature:

- ♦ New Dell EMC CloudIQ™ Integration

Feature Enhancements

The RESTful API Version 2.1 includes the following enhancements:

- ♦ Enhanced Logical and Physical Ports Management
- ♦ Enhanced XMS Support for Host Application Types

Backward Compatibility

Compatibility Policy

RESTful API resources and any related representations are maintained in a backward compatible manner within the major release Version 2, wherever possible.

The following guidelines define the XtremIO RESTful API backward compatibility policy:

- ♦ Command names are maintained.
- ♦ Command authorizations are maintained. The number of users can be increased (but not reduced).
- ♦ No parameters are removed.
- ♦ Parameters names and types are maintained.
- ♦ New parameters may be added.
- ♦ The order of parameters in a response may vary.
- ♦ Object values (such as `name`) may change for any object type other than `enum`, for which new values may be added, but existing values are maintained.
- ♦ Any bugs in the RESTful API are fixed.

New Dell EMC CloudIQ™ Integration

XtremIO RESTful API Version 3.1 supports XMS integration with Dell EMC CloudIQ™ for cloud-based proactive monitoring and intelligent, predictive analytics. Use XtremIO RESTful API Version 3.1 to determine whether Dell EMC CloudIQ™ is enabled. For more information about determining whether Dell EMC CloudIQ™ is enabled, see [Viewing the Details of an XMS](#) on page 663. For more information about Dell EMC CloudIQ™, see <http://support.emc.com> (the DELL EMC Support page).

Enhanced Logical and Physical Ports Management

XtremIO RESTful API Version 3.1 supports enhanced logical and physical ports management for DAE Controllers, Storage Controllers and Targets. For more information about logical and physical ports management, see [DAE Row Controllers](#) on page 157, [InfiniBand Switches](#) on page 203, [Storage Controllers](#) on page 510 and [Targets](#) on page 572.

Enhanced XMS Support for Host Application Types

XtremIO RESTful API Version 3.1 supports assigning host application types to Consistency Groups and Volumes. For more information about Consistency Groups Host Application Types, see [Modifying a Managed Cluster's Parameters](#) on page 99. For more information about Volume Host Application Types, see [Volumes](#) on page 604.

RESTful API Version 3.0 New Features and Enhancements

Main Enhancements

New Features

The RESTful API Version 3.0 includes the following new features:

- ♦ New Object GUID Identifiers Feature
- ♦ New XtremIO RESTful API Commands Feature
- ♦ New REST Object Support

Feature Enhancements

The RESTful API Version 3.0 includes enhancements to existing functionality

Appendix A – RESTful API Versions

and bug fixes.

Backward Compatibility

RESTful API Version 3 is not backwardly compatible with the previous major version, Version 2. For lists of the Version 3 new objects, new commands, parameter changes and removed objects, see Appendix B, [Changes from Ver. 6.0.1 to Ver. 6.1.0](#) on page 720.

New Object GUID Identifiers Feature

XtremIO Version 6.1 offers GUIDs as object identifiers in most command headers and HREFs. Object GUID identifiers are an additional option eliminating the requirement to specify a cluster index, and an object index number or object name in most commands and, instead, use only the object GUID syntax.

Note: For more information about Object GUID Identifiers, see [Object GUID Identifiers](#) on page 18.

New REST Object Support

- ♦ ip-links
GET /api/json/v3/types/ip-links
- ♦ local-protections
GET /api/json/v3/types/local-protections
- ♦ protection-domains
GET /api/json/v3/types/protection-domains
- ♦ r-consistency-groups
GET /api/json/v3/types/r-consistency-groups
- ♦ remote-protections
GET /api/json/v3/types/remote-protections
- ♦ retention-policies
GET /api/json/v3/types/retention-policies
- ♦ r-target-ports
GET /api/json/v3/types/r-target-ports
- ♦ r-volumes
GET /api/json/v3/types/r-volumes
- ♦ snapshot-groups
GET /api/json/v3/types/snapshot-groups
- ♦ volume-pairs
GET /api/json/v3/types/volume-pairs

Appendix A – RESTful API Versions

New XtremIO RESTful API Commands Feature

XtremIO Version 6.1 offers XtremIO RESTful API Commands for complicated operations that do not conform to general RESTful API practices for use of HTTP methods, such as POST for create and PUT for update.

Note: For more information about XtremIO RESTful API Commands, including an explanation of XtremIO RESTful API Commands, command syntax, and descriptions of each command, see [XtremIO RESTful API Commands](#), on page 13.

RESTful API Version 3.1 Enhancements

Main Enhancements

New Features

The RESTful API Version 3.1 includes the following new features:

- ♦ New Dell EMC CloudIQ™ Integration
- ♦ New Quality of Service Policy Management
- ♦ New REST Object Support
- ♦ New XtremIO RESTful API Commands

Feature Enhancements

The RESTful API Version 3.1 includes the following enhancements:

- ♦ Enhanced Logical and Physical Ports Management
- ♦ Enhanced Performance Data Collection Management
- ♦ Enhanced Savings Metrics Management
- ♦ Enhanced Snapshot-Set Management
- ♦ Enhanced XMS Support for Host Application Types

Backward Compatibility

Compatibility Policy

RESTful API resources and any related representations are maintained in a backward compatible manner within the major release Version 3, wherever possible.

The following guidelines define the XtremIO RESTful API backward compatibility policy:

- ♦ Command names are maintained.
- ♦ Command authorizations are maintained. The number of users can be increased (but not reduced).
- ♦ No parameters are removed.
- ♦ Parameters names and types are maintained.
- ♦ New parameters may be added.
- ♦ The order of parameters in a response may vary.
- ♦ Object values (such as `name`) may change for any object type other than `enum`, for which new values may be added, but existing values are maintained.
- ♦ Any bugs in the RESTful API are fixed.

New Dell EMC CloudIQ™ Integration

XtremIO RESTful API Version 3.1 supports XMS integration with Dell EMC CloudIQ™ for cloud-based proactive monitoring and intelligent, predictive analytics. Use XtremIO RESTful API Version 3.1 to determine whether Dell EMC CloudIQ™ is enabled. For more information about determining whether Dell EMC CloudIQ™ is enabled, see [Viewing the Details of an XMS](#) on page 663. For more information about Dell EMC CloudIQ™, see <http://support.emc.com> (the DELL EMC Support page).

New Quality of Service Policy Management

XtremIO RESTful API Version 3.1 supports Quality of Service Policy Management for Consistency Groups, Initiator-Groups and Volumes. Use XtremIO RESTful API Version 3.1 to configure Quality of Service Policies, assign

Appendix A – RESTful API Versions

policies to Consistency Groups, Initiator-Groups and Volumes, and enforce policies or monitor activity using policy parameters. For more information about Quality of Service Policies, see [Quality of Service \(QoS\) Policies](#) on page 353.

New REST Object Support

- ♦ consistency-group-copies
GET /api/json/v3/types/consistency-group-copies
- ♦ debug-info
GET /api/json/v3/types/debug-info
- ♦ qos-policies
GET /api/json/v3/types/qos-policies
- ♦ syr-notifier
GET /api/json/v3/types/syr-notifier
- ♦ volume-copies
GET /api/json/v3/types/volume-copies
- ♦ volumes-savings
GET /api/json/v3/types/volumes-savings

New XtremIO RESTful API Commands

- ♦ modify-performance-data-collection
PUT /api/json/v3/commands/volumes/modify-performance-data-collection

Note: For more information about the XtremIO RESTful API modify-performance-data-collection Command, see [Modifying the Performance Data Collection Mode for Volumes](#), on page 635.

Note: For more information about XtremIO RESTful API Commands, including an explanation of XtremIO RESTful API Commands, command syntax, and descriptions of each command, see [XtremIO RESTful API Commands](#) on page 13.

Appendix A – RESTful API Versions

Enhanced Logical and Physical Ports Management

XtremIO RESTful API Version 3.1 supports enhanced logical and physical ports management for DAE Controllers, Storage Controllers and Targets. For more information about logical and physical ports management, see [DAE Row Controllers](#) on page 157, [InfiniBand Switches](#) on page 203, [Storage Controllers](#) on page 510 and [Targets](#) on page 572.

Enhanced Performance Data Collection Management

XtremIO RESTful API Version 3.1 supports enhanced performance data collection management. Performance data collection can be enabled or disabled on the cluster level. If performance data collection is disabled on the cluster level, specific Volumes can be enabled to collect performance data. For more information about viewing the cluster level performance data collection enabled or disabled state, see [Viewing the Details of a Managed Cluster](#) on page 79. For more information on enabling performance data collection for specific Volumes if performance data collection is disabled at the cluster level, see [Modifying the Performance Data Collection Mode for Volumes](#), on page 635.

Note: If performance data collection is enabled at the cluster level, it cannot be disabled for specific Volumes.

Enhanced Savings Metrics Management

XtremIO RESTful API Version 3.1 supports enhanced saving metrics management. Volumes whose savings metrics (data reduction ratios) are calculated can be viewed. For more information about viewing Volume saving metrics, see [Volumes Savings](#) on page 646.

Note: For more information about calculating savings metrics, see [Calculating the Saving Metrics for Snapshot Groups](#) on page 485.

Enhanced Snapshot-Set Management

XtremIO RESTful API Version 3.1 supports enhanced Snapshot-Set management. List all copies (Snapshot-Sets) of specific Consistency Groups and list all copies of specific Volumes. For more information about Consistency Group Copies, see [Consistency Group Copies](#) on page 137. For more information about Volume Copies, see [Volume Copies](#) on page 637.

Enhanced XMS Support for Host Application Types

XtremIO RESTful API Version 3.1 supports assigning host application types to Consistency Groups and Volumes. For more information about Consistency Groups Host Application Types, see [Consistency Groups](#) on page 99. For more information about Volume Host Application Types, see [Volumes](#) on page 604.

Appendix B – RESTful API Changes

Changes from Ver. 3.0.X to Ver. 4.0

Parameter Changes by Object

The following tables list the XtremIO Storage Array RESTful API parameters that have changed from version 3.0.1 to version 4.0.

Table 17: Clusters

Parameter	Added	Removed	Changed
brick-id	No	Yes	N/A
cluster-expansion-in-progress	Yes	No	N/A
compression-factor-last-sample	No	Yes	N/A
debug-create-timeout	Yes	No	N/A
num-of-critical-alerts	Yes	No	N/A
num-of-igs	Yes	No	N/A
num-of-internal-vols	Yes	No	N/A
num-of-major-alerts	Yes	No	N/A
num-of-minor-alerts	Yes	No	N/A
obfuscate-debug	Yes	No	N/A
odx-mode	Yes	No	N/A
os-upgrade-in-progress	Yes	No	N/A
psnt-part-number	Yes	No	N/A
rd-bw-32kb	Yes	No	N/A
rd-latency-1mb	Yes	No	N/A
rg-max-ud-allowed	No	Yes	N/A
rg-min-ud-guaranteed	No	Yes	N/A
rg-min-ud-guaranteed-in-ssd-units	No	Yes	N/A
ssh-firewall-mode	Yes	No	N/A
sys-psnt-part-number	No	Yes	N/A
tag-list	Yes	No	N/A
under-maintenance	Yes	No	N/A

Table 17: Clusters

Parameter	Added	Removed	Changed
unequal-raid-groups-level	No	Yes	N/A
wr-iops-4kb	Yes	No	N/A

Table 18: X-Bricks

Parameter	Added	Removed	Changed
index	Yes	No	N/A
index-in-system	Yes	No	N/A
name	Yes	No	N/A
ups-list	Yes	No	N/A

Table 19: XEnvs

Parameter	Added	Removed	Changed
csid	Yes	No	N/A
num-of-mdls	Yes	No	N/A

Table 20: Storage Controllers

Parameter	Added	Removed	Changed
avg-node-temperature	Yes	No	N/A
free-disk-space	Yes	No	N/A
ib1-link-downed	Yes	No	N/A
ib1-link-downed-per-long-period	Yes	No	N/A
ib1-link-downed-per-minute	Yes	No	N/A
ib1-link-error-recoveries	Yes	No	N/A
ib1-link-error-recoveries-per-long-period	Yes	No	N/A
ib1-link-error-recoveries-per-minute	Yes	No	N/A
ib1-local-link-integrity-errors	Yes	No	N/A
ib1-local-link-integrity-errors-per-long-period	Yes	No	N/A
ib1-local-link-integrity-errors-per-minute	Yes	No	N/A

Appendix B – RESTful API Changes

Table 20: Storage Controllers

Parameter	Added	Removed	Changed
ib1-port-rcv-errors	Yes	No	N/A
ib1-port-rcv-errors-per-long-period	Yes	No	N/A
ib1-port-rcv-errors-per-minute	Yes	No	N/A
ib1-port-rcv-remote-physical-errors	Yes	No	N/A
ib1-port-rcv-remote-physical-errors-per-long-period	Yes	No	N/A
ib1-port-rcv-remote-physical-errors-per-minute	Yes	No	N/A
ib1-symbol-errors	Yes	No	N/A
ib1-symbol-errors-per-long-period	Yes	No	N/A
ib1-symbol-errors-per-minute	Yes	No	N/A
ib2-link-downed	Yes	No	N/A
ib2-link-downed-per-long-period	Yes	No	N/A
ib2-link-downed-per-minute	Yes	No	N/A
ib2-link-error-recoveries	Yes	No	N/A
ib2-link-error-recoveries-per-long-period	Yes	No	N/A
ib2-link-error-recoveries-per-minute	Yes	No	N/A
ib2-local-link-integrity-errors	Yes	No	N/A
ib2-local-link-integrity-errors-per-long-period	Yes	No	N/A
ib2-local-link-integrity-errors-per-minute	Yes	No	N/A
ib2-port-rcv-errors	Yes	No	N/A
ib2-port-rcv-errors-per-long-period	Yes	No	N/A
ib2-port-rcv-errors-per-minute	Yes	No	N/A
ib2-port-rcv-remote-physical-errors	Yes	No	N/A
ib2-port-rcv-remote-physical-errors-per-long-period	Yes	No	N/A
ib2-port-rcv-remote-physical-errors-per-minute	Yes	No	N/A
ib2-symbol-errors	Yes	No	N/A
ib2-symbol-errors-per-long-period	Yes	No	N/A

Table 20: Storage Controllers

Parameter	Added	Removed	Changed
ib2-symbol-errors-per-minute	Yes	No	N/A
index	Yes	No	N/A
ipmi-addr-subnet	Yes	No	N/A
ipmi-gw-ip	Yes	No	N/A
jbod-lcc-discovery-needed	Yes	No	N/A
mgmt-gw-ip	Yes	No	N/A
mgmt-port-duplex	Yes	No	N/A
node-high-file-descriptors	Yes	No	N/A
node-low-ram	Yes	No	N/A
node-mgr-addr-subnet	Yes	No	N/A
os-upgrade-current-step	Yes	No	N/A
remote-journal-health-state	Yes	No	N/A
sas1-port-misconfiguration	Yes	No	N/A
sas2-port-misconfiguration	Yes	No	N/A
sc-start-timestamp	Yes	No	N/A
sc-power-buttons	Yes	No	N/A
sc-start-timestamp-display	Yes	No	N/A
ups-prev-day-uptime	Yes	No	N/A
ups-uptime	Yes	No	N/A

Table 21: Data Protection Groups

Parameter	Added	Removed	Changed
name	Yes	No	N/A
rebalance-in-progress	Yes	No	N/A
rebalance-progress	Yes	No	N/A
rebuild-progress	Yes	No	N/A
ssd-preparation-progress	Yes	No	N/A
tag-list	Yes	No	N/A

Table 22: Volumes

Parameter	Added	Removed	Changed

Appendix B – RESTful API Changes

Parameter	Added	Removed	Changed
acc-num-of-unaligned-wr	Yes	No	N/A
acc-num-of-wr	Yes	No	N/A
acc-size-of-rd	Yes	No	N/A
certainty	Yes	No	N/A
name	Yes	No	N/A
owner	Yes	No	N/A
permissions	Yes	No	N/A
permissions-text	Yes	No	N/A
small-bw	Yes	No	N/A
small-io-ratio	Yes	No	N/A
small-rd-iops	Yes	No	N/A
small-wr-iops	Yes	No	N/A
snapsets	Yes	No	N/A
tag-list	Yes	No	N/A
unaligned-io-ratio	Yes	No	N/A
unaligned-wr-bw	Yes	No	N/A
unaligned-wr-iops	Yes	No	N/A

Table 23: Snapshots

Parameter	Added	Removed	Changed
certainty	Yes	No	N/A
owner	Yes	No	N/A
permissions	Yes	No	N/A
permissions-text	Yes	No	N/A

Table 24: Initiators

Parameter	Added	Removed	Changed
authentication-chap-initiators-missing-credentials	Yes	No	N/A
certainty	Yes	No	N/A
discovery-chap-initiators-missing-credentials	Yes	No	N/A

Table 25: Initiator Groups

Parameter	Added	Removed	Changed
certainty	Yes	No	N/A

Table 26: iSCSI Portals

Parameter	Added	Removed	Changed
certainty	Yes	No	N/A

Table 27: LUN Mapping

Parameter	Added	Removed	Changed
certainty	Yes	No	N/A
index	Yes	No	N/A
name	Yes	No	N/A

Table 28: SSDs

Parameter	Added	Removed	Changed
certainty	Yes	No	N/A

Table 29: Targets

Parameter	Added	Removed	Changed
certainty	Yes	No	N/A
eth-kbytes-rx	Yes	No	N/A
eth-kbytes-tx	Yes	No	N/A
eth-pkt-rx	Yes	No	N/A
eth-pkt-rx-crc-error	Yes	No	N/A
eth-pkt-rx-no-buffer-error	Yes	No	N/A
eth-pkt-tx	Yes	No	N/A
eth-pkt-tx-error	Yes	No	N/A
fc-seq-retx-req-count	Yes	No	N/A
port-mac-addr	Yes	No	N/A
relative-target-port	Yes	No	N/A
unaligned-wr-iops	Yes	No	N/A

Appendix B – RESTful API Changes

Changes from Ver. 4.0 to Ver. 4.0.2

Parameter Changes by Object

The following tables list the XtremIO Storage Array RESTful API parameters that have changed from version 4.0 to version 4.0.2.

Table 30: Data Protection Groups

Parameter	Added	Removed	Changed
proactive-metadata-loading	Yes	No	N/A

Table 31: Alerts

Parameter	Added	Removed	Changed
oid	No	Yes	N/A

Table 32: Alert Definitions

Parameter	Added	Removed	Changed
oid	No	Yes	N/A

Changes from Ver. 4.0.2 to Ver. 4.2.0

Parameter Changes by Object

The following tables list the XtremIO Storage Array RESTful API parameters that have changed from version 4.0.2 to version 4.2.0.

Table 33: Alerts

Parameter	Added	Removed	Changed
command	No	No	Yes

Table 34: Consistency Group Volumes

Parameter	Added	Removed	Changed
Vol-access	Yes	No	N/A

Table 35: Clusters

Parameter	Added	Removed	Changed
debug-createtimetypeout	Yes	No	N/A
iscsi-tcp-port	Yes	No	N/A
obfuscate-debug	Yes	No	N/A
odx-mode	Yes	No	N/A

Table 36: Targets

Parameter	Added	Removed	Changed
ip-address	Yes	No	N/A
port-type	Yes	No	N/A

Appendix B – RESTful API Changes**Changes from Ver. 4.2.0 to Ver. 6.0.0****New Objects****Advisory-Notices Object**

Note: For more information about the Advisory Notices object, see [Advisory Notices](#) on page 44.

The Advisory-Notices object contains the following properties:

- ♦ advisory-notice-category
- ♦ advisory-notice-id
- ♦ advisory-notice-name
- ♦ advisory-notice-state
- ♦ advisory-text
- ♦ associated-cluster-id
- ♦ associated-cluster-psnt
- ♦ creation-time
- ♦ download-completion-state
- ♦ guid
- ♦ index
- ♦ name
- ♦ role-visibility
- ♦ xms-id

DAE-Row-Controller Object

Note: For more information about the DAE Row Controller object, see [DAE Row Controllers](#) on page 157.

The DAE-Row-Controller object contains the following properties:

- ♦ dae-row-controller-id
- ♦ enabled-state
- ♦ failure-reason
- ♦ fru-lifecycle-state
- ♦ fru-replace-failure-reason
- ♦ fw-version
- ♦ fw-version-error
- ♦ guid
- ♦ hw-revision
- ♦ identify-led
- ♦ index
- ♦ jbod-controller-id
- ♦ jbod-id
- ♦ jbod-index
- ♦ jbod-name
- ♦ location
- ♦ location-index
- ♦ managing-populated-row
- ♦ model-name
- ♦ name
- ♦ obj-severity
- ♦ part-number
- ♦ phy-ports

Appendix B – RESTful API Changes

- ♦ row-id
- ♦ sas1-port-enabled-state
- ♦ sas1-port-health-state
- ♦ sas1-port-rate
- ♦ sas1-port-state
- ♦ serial-number
- ♦ status-led
- ♦ sys-id
- ♦ sys-index
- ♦ sys-name
- ♦ temperature
- ♦ temperature-state

NVRAM Object

Note: For more information about the NVRAM object, see [NVRAM](#) on page 311.

The NVRAM object contains the following properties:

- ♦ acc-correctable-errors
- ♦ correctable-errors
- ♦ flash-bad-block-level
- ♦ flash-num-bad-blocks
- ♦ flash-wear-level
- ♦ fru-lifecycle-state
- ♦ fw-version
- ♦ fw-version-error
- ♦ guid
- ♦ index
- ♦ name

- ♦ node-id
- ♦ node-index
- ♦ node-name
- ♦ nvram-card-temp
- ♦ nvram-fail-reason
- ♦ nvram-id
- ♦ nvram-internal-state
- ♦ nvram-last-backup-duration
- ♦ nvram-last-backup-status
- ♦ nvram-last-backup-time
- ♦ nvram-last-restore-duration
- ♦ nvram-last-restore-status
- ♦ nvram-last-restore-time
- ♦ nvram-number-of-backup
- ♦ nvram-number-of-backups-bank1
- ♦ nvram-number-of-backups-bank2
- ♦ nvram-number-of-fw-upgrades
- ♦ nvram-number-of-restore
- ♦ obj-severity
- ♦ supercap-max-temp
- ♦ supercap-short-circuit
- ♦ supercap-temp
- ♦ supercap-temp-level
- ♦ sys-id
- ♦ sys-index
- ♦ sys-name
- ♦ xms-id

Appendix B – RESTful API Changes

Parameter Changes by Object

The following tables list the XtremIO Storage Array RESTful API parameters that have changed from version 4.2.0 to version 6.0.0.

Table 37: Alerts

Parameter	Added	Removed	Changed
sys-index	Yes	No	N/A

Table 38: Alert-Definitions

Note: Alert Definitions are each an object rather than parameters of a single object.

Object	Added	Removed	Changed
alert_def_add_pending	Yes	No	N/A
alert_def_dae_overheat	Yes	No	N/A
alert_def_daecontroller_temperature_critical	Yes	No	N/A
alert_def_daecontroller_temperature_high	Yes	No	N/A
alert_def_daecontroller_temperature_invalid	Yes	No	N/A
alert_def_daerowcontroller_fru_disconnected	Yes	No	N/A
alert_def_daerowcontroller_fru_failed	Yes	No	N/A
alert_def_daerowcontroller_fru_prepare_failed	Yes	No	N/A
alert_def_daerowcontroller_fru_uninitialized	Yes	No	N/A
alert_def_daerowcontroller_fw_invalid	Yes	No	N/A
alert_def_daerowcontroller_fw_mismatch	Yes	No	N/A
alert_def_daerowcontroller_fw_upgrading	Yes	No	N/A
alert_def_daerowcontroller_port1_level_2_unknown	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Added	Removed	Changed
alert_def_daerowcontroller_port1_level_4_minor	Yes	No	N/A
alert_def_daerowcontroller_port1_level_5_major	Yes	No	N/A
alert_def_daerowcontroller_port1_level_6_critical	Yes	No	N/A
alert_def_daerowcontroller_sas1_health_degraded	Yes	No	N/A
alert_def_daerowcontroller_sas1_health_failed	Yes	No	N/A
alert_def_daerowcontroller_sas1_port_down	Yes	No	N/A
alert_def_daerowcontroller_sas1_system_disabled	Yes	No	N/A
alert_def_daerowcontroller_system_disabled	Yes	No	N/A
alert_def_daerowcontroller_temperature_critical	Yes	No	N/A
alert_def_daerowcontroller_temperature_high	Yes	No	N/A
alert_def_daerowcontroller_temperature_invalid	Yes	No	N/A
alert_def_daerowcontroller_user_disabled	Yes	No	N/A
alert_def_esrs_gateway_disconnected	Yes	No	N/A
alert_def_esrs_gateway_primary_unreachable	Yes	No	N/A
alert_def_esrs_gateway_secondary_unreachable	Yes	No	N/A
alert_def_esrsve_clusters_disconnected	Yes	No	N/A
alert_def_esrsve_clusters_partially_disconnected	Yes	No	N/A
alert_def_ibswitch_fan_module1_failed	Yes	No	N/A
alert_def_ibswitch_fan_module1_one_fan_failed	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Added	Removed	Changed
alert_def_ibswitch_fan_module2_failed	Yes	No	N/A
alert_def_ibswitch_fan_module2_one_fan_failed	Yes	No	N/A
alert_def_ibswitch_fan_module3_failed	Yes	No	N/A
alert_def_ibswitch_fan_module3_one_fan_failed	Yes	No	N/A
alert_def_ibswitch_fan_module4_failed	Yes	No	N/A
alert_def_ibswitch_fan_module4_one_fan_failed	Yes	No	N/A
alert_def_ip_link_add_pending	Yes	No	N/A
alert_def_ip_link_add_pending	Yes	No	N/A
alert_def_ip_link_inconsistent	Yes	No	N/A
alert_def_ip_link_modify_pending	Yes	No	N/A
alert_def_ip_link_modify_pending	Yes	No	N/A
alert_def_ip_link_remove_pending	Yes	No	N/A
alert_def_ip_link_remove_pending	Yes	No	N/A
alert_def_ip_link_state_down	Yes	No	N/A
alert_def_ip_link_state_inconsistent	Yes	No	N/A
alert_def_ip_link_state_initializing	Yes	No	N/A
alert_def_ip_link_system_disabled	Yes	No	N/A
alert_def_ip_link_user_disabled	Yes	No	N/A
alert_def_jbod_fan_pair1_degraded	Yes	No	N/A
alert_def_jbod_fan_pair1_disconnected	Yes	No	N/A
alert_def_jbod_fan_pair1_failed	Yes	No	N/A
alert_def_jbod_fan_pair2_degraded	Yes	No	N/A
alert_def_jbod_fan_pair2_disconnected	Yes	No	N/A
alert_def_jbod_fan_pair2_failed	Yes	No	N/A
alert_def_jbod_fan_pair3_degraded	Yes	No	N/A
alert_def_jbod_fan_pair3_disconnected	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Added	Removed	Changed
alert_def_jbod_fan_pair3_failed	Yes	No	N/A
alert_def_jbod_fan_pair4_degraded	Yes	No	N/A
alert_def_jbod_fan_pair4_disconnected	Yes	No	N/A
alert_def_jbod_fan_pair4_failed	Yes	No	N/A
alert_def_jbod_temperature_critical	Yes	No	N/A
alert_def_jbod_temperature_critical_ssd	Yes	No	N/A
alert_def_jbod_temperature_high	Yes	No	N/A
alert_def_jbod_temperature_high_ssd	Yes	No	N/A
alert_def_jbod_temperature_invalid	Yes	No	N/A
alert_def_jbodcontroller_fru_degraded	Yes	No	N/A
alert_def_lcc_internal_port_level_2_unknown	Yes	No	N/A
alert_def_lcc_internal_port_level_3_warning	Yes	No	N/A
alert_def_lcc_internal_port_level_4_minor	Yes	No	N/A
alert_def_lcc_internal_port_level_5_major	Yes	No	N/A
alert_def_lcc_internal_port_level_6_critical	Yes	No	N/A
alert_def_lcc_internal_sas_health_degraded	Yes	No	N/A
alert_def_lcc_internal_sas_health_failed	Yes	No	N/A
alert_def_lcc_internal_sas_system_disabled	Yes	No	N/A
alert_def_lcc_sas1_port_down	Yes	No	N/A
alert_def_modify_pending	Yes	No	N/A
alert_def_node_discover_dae_row_ctrl_true	Yes	No	N/A
alert_def_node_ipmiport_wrong_usb_port	Yes	No	N/A
alert_def_node_remote_ipmi_opened	Yes	No	N/A
alert_def_node_sas1_port_down	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Added	Removed	Changed
alert_def_node_sas2_port_down	Yes	No	N/A
alert_def_nvram_flash_wear_high	Yes	No	N/A
alert_def_nvram_flash_wear_marginal	Yes	No	N/A
alert_def_nvram_fru_disconnected	Yes	No	N/A
alert_def_nvram_fru_failed	Yes	No	N/A
alert_def_nvram_fru_prepare_failed	Yes	No	N/A
alert_def_nvram_fru_uninitialized	Yes	No	N/A
alert_def_nvram_fw_invalid	Yes	No	N/A
alert_def_nvram_fw_mismatch	Yes	No	N/A
alert_def_nvram_fw_upgrading	Yes	No	N/A
alert_def_nvram_supercap_status_failed	Yes	No	N/A
alert_def_nvram_supercap_status_warn	Yes	No	N/A
alert_def_nvram_supercap_temp_high	Yes	No	N/A
alert_def_nvram_supercap_temp_very_high	Yes	No	N/A
alert_def_remove_pending	Yes	No	N/A
alert_def_rg_state_integrate	Yes	No	N/A
alert_def_rg_state_rebuild	Yes	No	N/A
alert_def_rm_domain_clocks_skewed	Yes	No	N/A
alert_def_scheduler_add_pending	Yes	No	N/A
alert_def_scheduler_modify_pending	Yes	No	N/A
alert_def_scheduler_remove_pending	Yes	No	N/A
alert_def_ssd_health_degraded	Yes	No	N/A
alert_def_ssd_health_failed	Yes	No	N/A
alert_def_ssd_temperature_critical	Yes	No	N/A
alert_def_ssd_temperature_high	Yes	No	N/A
alert_def_ssd_temperature_invalid	Yes	No	N/A
alert_def_sys_disc_chap_initiators_miscluster_credentials_true	Yes	No	N/A
alert_def_sys_notifier_disabled	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Added	Removed	Changed
ualert_def_notifier_disabled	No	Yes	N/A
ualert_def_sas_sas1_port_down	No	Yes	N/A
ualert_def_sas1_port_down	No	Yes	N/A
ualert_def_sas2_port_down	No	Yes	N/A
ualert_def_sys_chap_init_missing_cluster_credentials	No	Yes	N/A
ualert_def_sys_chap_init_missing_credentials	No	Yes	N/A
ualert_def_sys_discovery_chap_initiators_missing_cluster_credentials_true	No	Yes	N/A
ualert_def_sys_hw_pkg_inconsistent	No	Yes	N/A

Table 39: Bricks

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 40: Clusters

Parameter	Added	Removed	Changed
dae-temperature-monitor-mode	Yes	No	N/A
hardware-platform	Yes	No	N/A
installation-type	Yes	No	N/A
installation-type-details	Yes	No	N/A
last-query-discovered-initiator-connectivity-timestamp	Yes	No	N/A
last-query-initiator-connectivity-timestamp	Yes	No	N/A
max-cgs	Yes	No	N/A
max-cgs-per-vol	Yes	No	N/A
max-igs	Yes	No	N/A
max-initiators	Yes	No	N/A
max-initiators-in-igs	Yes	No	N/A

Appendix B – RESTful API Changes

Parameter	Added	Removed	Changed
max-mapped-volumes	Yes	No	N/A
max-mappings	Yes	No	N/A
max-num-schedulers	Yes	No	N/A
max-snapshots-per-vol	Yes	No	N/A
max-snapshots-per-volume	Yes	No	N/A
max-vol-per-cg	Yes	No	N/A
max-volumes	Yes	No	N/A
sym-sys-state	Yes	No	N/A
sys-index	Yes	No	N/A

Table 41: Consistency Groups

Parameter	Added	Removed	Changed
creation-time	Yes	No	N/A
last-refreshed-from-obj-index	Yes	No	N/A
last-refreshed-from-obj-name	Yes	No	N/A
last-refresh-from-obj-id	Yes	No	N/A
last-refresh-time	Yes	No	N/A
linked-consistency-group	Yes	No	N/A
linked-consistency-group-index	Yes	No	N/A
linked-consistency-group-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 42: DAEs

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
fan-1-rpm	Yes	No	N/A
fan-2-rpm	Yes	No	N/A
fan-3-rpm	Yes	No	N/A
fan-4-rpm	Yes	No	N/A

Appendix B – RESTful API Changes

Parameter	Added	Removed	Changed
fan-5-rpm	Yes	No	N/A
fan-6-rpm	Yes	No	N/A
fan-7-rpm	Yes	No	N/A
fan-8-rpm	Yes	No	N/A
fan-pair1-hardware-label	Yes	No	N/A
fan-pair1-status	Yes	No	N/A
fan-pair2-hardware-label	Yes	No	N/A
fan-pair2-status	Yes	No	N/A
fan-pair3-hardware-label	Yes	No	N/A
fan-pair3-status	Yes	No	N/A
fan-pair4-hardware-label	Yes	No	N/A
fan-pair4-status	Yes	No	N/A
jbod-index	Yes	No	N/A
jbod-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 43: DAE Controllers

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
hardware-label	Yes	No	N/A
jbod-index	Yes	No	N/A
jbod-name	Yes	No	N/A
location-index	Yes	No	N/A
port-state	Yes	No	N/A
sas1-port-hardware-label	Yes	No	N/A
sas2-port-hardware-label	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A
temperature-state	Yes	No	N/A

Appendix B – RESTful API Changes

Table 44: DAE PSUS

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
hardware-label	Yes	No	N/A
jbod-index	Yes	No	N/A
jbod-name	Yes	No	N/A
location-index	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 45: Data Protection Groups

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
dpg-state	Yes	No	N/A
node-list	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A
ud-ssd-space-in-use-ratio	Yes	No	N/A

Table 46: InfiniBand Switches

Parameter	Added	Removed	Changed
fan-5-rpm	Yes	No	N/A
fan-6-rpm	Yes	No	N/A
fan-7-rpm	Yes	No	N/A
fan-8-rpm	Yes	No	N/A
fan-fru-replace-supported	Yes	No	N/A
fan-module1-hardware-label	Yes	No	N/A
fan-module1-status	Yes	No	N/A
fan-module2-hardware-label	Yes	No	N/A
fan-module2-status	Yes	No	N/A

Appendix B – RESTful API Changes

Parameter	Added	Removed	Changed
fan-module3-hardware-label	Yes	No	N/A
fan-module3-status	Yes	No	N/A
fan-module4-hardware-label	Yes	No	N/A
fan-module4-status	Yes	No	N/A
hardware-label	Yes	No	N/A
ib-switch-name	Yes	No	N/A
location-index	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Appendix B – RESTful API Changes

Table 47: Initiators

Parameter	Added	Removed	Changed
ig-index	Yes	No	N/A
ig-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 48: Initiator Groups

Parameter	Added	Removed	Changed
num-of-conn-tars	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 49: Initiator Group Folders

Parameter	Added	Removed	Changed
sys-id	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 50: ISCI Portals

Parameter	Added	Removed	Changed
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A
tar-index	Yes	No	N/A
tar-name	Yes	No	N/A

Table 51: ISCI Routes

Parameter	Added	Removed	Changed
certainty	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 52: LDAP Configs

Parameter	Added	Removed	Changed
obj-severity	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 53: Local Disks

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
location-index	Yes	No	N/A
node-index	Yes	No	N/A
node-name	Yes	No	N/A
smart-health-status	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 54: LUN Maps

Parameter	Added	Removed	Changed
ig-id	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A
tg-id	Yes	No	N/A

Table 55: Schedulers

Parameter	Added	Removed	Changed
in-progress	Yes	No	N/A

Appendix B – RESTful API Changes

Parameter	Added	Removed	Changed
obj-severity	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 56: Snapshots

Parameter	Added	Removed	Changed
ancestor-vol-name	Yes	No	N/A
last-refreshed-from-obj-name	Yes	No	N/A
last-refresh-from-obj-id	Yes	No	N/A
last-refresh-time	Yes	No	N/A
management-locked	Yes	No	N/A
snapgrp-index	Yes	No	N/A
snapgrp-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 57: Snapshot Sets

Parameter	Added	Removed	Changed
created-from-obj-id	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 58: SSDs

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
rg-index	Yes	No	N/A
rg-name	Yes	No	N/A
slot-state	Yes	No	N/A
ssd-index	Yes	No	N/A

Appendix B – RESTful API Changes

Parameter	Added	Removed	Changed
ssd-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A
temperature-state	Yes	No	N/A
uswap-led	No	Yes	N/A

Table 59: Slots

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
obj-severity	Yes	No	N/A
slot-power-state	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 60: Storage Controllers

Parameter	Added	Removed	Changed
acc-dimm-correctable-errors	Yes	No	N/A
brick-name	Yes	No	N/A
hardware-label	Yes	No	N/A
ib1-port-hardware-label	Yes	No	N/A
ib2-port-hardware-label	Yes	No	N/A
node-name	Yes	No	N/A
sas1-port-hardware-label	Yes	No	N/A
sas2-port-hardware-label	Yes	No	N/A
sym-start-timestamp	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 61: Storage Controllers PSUS

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A

Appendix B – RESTful API Changes

Parameter	Added	Removed	Changed
brick-name	Yes	No	N/A
hardware-label	Yes	No	N/A
location-index	Yes	No	N/A
node-index	Yes	No	N/A
node-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 62: Tags

Parameter	Added	Removed	Changed
obj-severity	Yes	No	N/A
sys-id	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 63: Targets

Parameter	Added	Removed	Changed
hardware-label	Yes	No	N/A
node-index	Yes	No	N/A
node-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A
tg-index	Yes	No	N/A

Table 64: Target Groups

Parameter	Added	Removed	Changed
acc-num-of-rd	Yes	No	N/A
sys-index	Yes	No	N/A
unaligned-bw	Yes	No	N/A

Table 65: User Accounts

Parameter	Added	Removed	Changed
public-key	Yes	No	N/A

Table 66: Volumes

Parameter	Added	Removed	Changed
ancestor-vol-name	Yes	No	N/A
last-refreshed-from-obj-name	Yes	No	N/A
last-refresh-from-obj-id	Yes	No	N/A
last-refresh-time	Yes	No	N/A
management-locked	Yes	No	N/A
snapgrp-index	Yes	No	N/A
snapgrp-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 67: Volume-Folders

Parameter	Added	Removed	Changed
sys-id	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Table 68: XENVIS

Parameter	Added	Removed	Changed
brick-index	Yes	No	N/A
brick-name	Yes	No	N/A
node-index	Yes	No	N/A
node-name	Yes	No	N/A
sys-index	Yes	No	N/A
sys-name	Yes	No	N/A

Appendix B – RESTful API Changes

Table 69: XMS

Parameter	Added	Removed	Changed
advisory-notifications-processing *	Yes	No	N/A
dns-servers-list	Yes	No	N/A
max-num-of-advisory-notices*	Yes	No	N/A
min-tls-version	Yes	No	N/A
node-list	Yes	No	N/A
node-list	Yes	No	N/A
num-of-bricks	Yes	No	N/A
ssd-space-in-use	Yes	No	N/A
ssd-space-in-use	Yes	No	N/A
sys-name	Yes	No	N/A

Changes from Ver. 6.0.0 to Ver. 6.0.1

Version 6.0.1 supports both X1 and X2 hardware cluster types. Advisory notices integrating with the ESRS service are supported.

Changes from Ver. 6.0.1 to Ver. 6.1.0**New Objects****IP-Links Object**

Note: For more information about the IP-Links object, see [Remote Protection IP-Links](#) on page 376.

The IP-Links object contains the following properties:

- ♦ a_end_ip_addr
- ♦ a_end_ip_addr_sn

* This parameter is not supported in the current RESTful API version. Support for this parameter is planned for an upcoming version.

- ♦ a_end_ip_link_id
- ♦ a_end_port_id
- ♦ a_end_sys_id
- ♦ a_end_xms_id
- ♦ a_to_z_acc_received_data
- ♦ a_to_z_acc_requests_received
- ♦ a_to_z_acc_requests_sent
- ♦ a_to_z_acc_sent_data
- ♦ a_to_z_bw_received_data_rate
- ♦ a_to_z_bw_requests_sent_rate
- ♦ a_to_z_bw_sent_data_rate
- ♦ a_to_z_ping_round_trip_time
- ♦ a_to_z_requests_processing_time
- ♦ a_to_z_requests_received_rate
- ♦ a_to_z_requests_round_trip_time
- ♦ certainty
- ♦ dropped_packets
- ♦ enabled_state
- ♦ ip_link_consistency_state
- ♦ ip_link_name
- ♦ ip_link_pairing_label_id
- ♦ ip_link_state
- ♦ link_rate
- ♦ obj_severity
- ♦ protocol
- ♦ z_end_ip_addr
- ♦ z_end_ip_addr_sn

Appendix B – RESTful API Changes

- ♦ z_end_ip_link_id
- ♦ z_end_port_id
- ♦ z_end_sys_id
- ♦ z_end_xms_id
- ♦ z_to_a_acc_received_data
- ♦ z_to_a_acc_requests_received
- ♦ z_to_a_acc_requests_sent
- ♦ z_to_a_acc_sent_data
- ♦ z_to_a_bw_received_data_rate
- ♦ z_to_a_bw_requests_sent_rate
- ♦ z_to_a_bw_sent_data_rate
- ♦ z_to_a_ping_round_trip_time
- ♦ z_to_a_requests_processing_time
- ♦ z_to_a_requests_received_rate
- ♦ z_to_a_requests_round_trip_time

Local-Protections Object

Note: For more information about the Local-Protections object, see [Local Protections](#) on page 286.

The Local-Protections object contains the following properties:

- ♦ actual_protection_window_copies
- ♦ actual_protection_window_duration_in_days
- ♦ defined_protection_window_duration_in_days
- ♦ defined_protection_window_num_copies
- ♦ last_activation_status
- ♦ last_activation_time
- ♦ local_protection_type

- ♦ name
- ♦ next_scheduled_cycle
- ♦ obj_severity
- ♦ rpo_sec
- ♦ rpo_status
- ♦ schedule
- ♦ snapped_object_id
- ♦ snapped_object_index
- ♦ snapped_object_name
- ♦ snapped_object_type
- ♦ snapshot_type
- ♦ suffix
- ♦ sys_id
- ♦ sys_index
- ♦ sys_name
- ♦ tag_list
- ♦ target_cg_id
- ♦ target_failover_timestamp
- ♦ target_num_snapshot_sets
- ♦ target_retention_policy_guid
- ♦ target_retention_policy_id
- ♦ target_snapshot_set_num_copies_status
- ♦ target_snapshot_set_window_size_status
- ♦ target_sys_id
- ♦ target_xms_id
- ♦ verification_enabled_state
- ♦ verification_status

Appendix B – RESTful API Changes

- ♦ volume_pair_list

Protection-Domains Object

Note: For more information about the Protection-Domains object, see [Local Protections](#) on page 286.

The Local-Protections object contains the following properties:

- ♦ failure_reason
- ♦ fru-lifecycle-state
- ♦ index
- ♦ ip_addr
- ♦ name
- ♦ num_links
- ♦ num_of_cluster
- ♦ num_of_xms
- ♦ num_replication_sessions
- ♦ nvram-number-of-restore
- ♦ obj_severity
- ♦ obj-severity
- ♦ port_id
- ♦ supercap-max-temp
- ♦ sys_connectivity_state
- ♦ sys_id
- ♦ sys-index
- ♦ system_active_status
- ♦ xenv_guid
- ♦ xms_clocks_skew_status
- ♦ xms_list[].xms_connectivity_state

- ♦ xms_list[].xms_domain_membership_name
- ♦ xms_list[].xms_id
- ♦ xms_list[].xms_ip_address

R-Consistency Groups Object

Note: For more information about the R-Consistency Groups object, see [Remote Protection Consistency Group](#) on page 372.

The Local-Protections object contains the following properties:

- ♦ creation_time
- ♦ index
- ♦ last_refresh_from_obj_id
- ♦ last_refresh_time
- ♦ last_refreshed_from_obj_name
- ♦ linked_consistency_group
- ♦ linked_consistency_group_name
- ♦ num_local_protections
- ♦ num_of_snap_sets

Remote-Protections Object

Note: For more information about the Remote-Protections object, see [Remote Protection Sessions](#) on page 393.

The Local-Protections object contains the following properties:

- ♦ activation_time
- ♦ actual_protection_window_copies
- ♦ actual_protection_window_duration_in_days
- ♦ block_access_type
- ♦ current_command_name
- ♦ current_command_status

Appendix B – RESTful API Changes

- ♦ cycle_duration_sec
- ♦ cycle_number
- ♦ cycle_percent_remaining
- ♦ cycle_start_time
- ♦ cycle_time_remaining_sec
- ♦ defined_protection_window_num_copies
- ♦ initial_source_sys_guid
- ♦ initial_target_sys_guid
- ♦ mode
- ♦ name
- ♦ next_scheduled_cycle
- ♦ num_missing_long_period_pits
- ♦ num_missing_middle_period_pits
- ♦ num_missing_short_period_pits
- ♦ obj_severity
- ♦ protection_window_duration_in_days
- ♦ remote_protection_session_consistency_state
- ♦ remote_sys_guid
- ♦ replication_direction
- ♦ replication_session_id
- ♦ replication_state
- ♦ replication_state_details
- ♦ rpo_sec
- ♦ rpo_status
- ♦ source_cg_id
- ♦ source_failover_timestamp
- ♦ source_num_snapshot_sets

- ♦ source_retention_policy_guid
- ♦ source_sys_id
- ♦ source_xms_id
- ♦ target_cg_id
- ♦ target_failover_timestamp
- ♦ target_num_snapshot_sets
- ♦ target_retention_policy_guid
- ♦ target_retention_policy_id
- ♦ target_snapshot_set_num_copies_status
- ♦ target_snapshot_set_window_size_status
- ♦ target_sys_id
- ♦ target_xms_id
- ♦ verification_enabled_state
- ♦ verification_status
- ♦ volume_pair_list

Retention-Policies Object

Note: For more information about the Retention-Policies object, see [Retention Policies](#) on page 432.

The Local-Protections object contains the following properties:

- ♦ certainty
- ♦ index
- ♦ long_period_duration
- ♦ long_period_unit
- ♦ long_retention_copies
- ♦ middle_period_duration
- ♦ middle_period_unit
- ♦ middle_retention_copies

Appendix B – RESTful API Changes

- ♦ name
- ♦ num_references
- ♦ protection_window_duration_in_days
- ♦ protection_window_num_copies
- ♦ replication_session_list
- ♦ retention_policy_id
- ♦ rm_id
- ♦ short_period_duration
- ♦ short_retention_copies
- ♦ sys_id
- ♦ sys_index

R-Snapshot-Sets Object

- ♦ certainty
- ♦ created-by-app
- ♦ obj-severity
- ♦ replication_session_pairing_label_id
- ♦ rm_id
- ♦ source_sys_id
- ♦ source_vol_size
- ♦ source_volume_id
- ♦ source_volume_pair_id
- ♦ target_sys_id
- ♦ target_vol_size
- ♦ target_volume_id
- ♦ target_volume_pair_id
- ♦ volume_pair_consistency_state

R-Target-Ports Object

Note: For more information about the R-Target-Ports object, see [Remote Protection Ports](#) on page 388.

The Local-Protections object contains the following properties:

- ♦ a_end_ip_addr
- ♦ a_end_ip_addr_sn
- ♦ a_end_ip_link_id
- ♦ a_end_port_id
- ♦ a_end_sys_id
- ♦ a_end_xms_id
- ♦ a_to_z_acc_received_data
- ♦ a_to_z_acc_requests_received
- ♦ a_to_z_acc_requests_sent
- ♦ a_to_z_acc_sent_data
- ♦ a_to_z_bw_received_data_rate
- ♦ a_to_z_bw_requests_sent_rate
- ♦ a_to_z_bw_sent_data_rate
- ♦ a_to_z_ping_round_trip_time
- ♦ a_to_z_requests_processing_time
- ♦ a_to_z_requests_received_rate
- ♦ a_to_z_requests_round_trip_time
- ♦ certainty
- ♦ dropped_packets
- ♦ enabled_state
- ♦ ip_link_consistency_state
- ♦ ip_link_name
- ♦ ip_link_pairing_label_id

Appendix B – RESTful API Changes

- ♦ ip_link_state
- ♦ link_rate
- ♦ obj_severity
- ♦ protocol
- ♦ z_end_ip_addr
- ♦ z_end_ip_addr_sn
- ♦ z_end_ip_link_id
- ♦ z_end_port_id
- ♦ z_end_sys_id
- ♦ z_end_xms_id
- ♦ z_to_a_acc_received_data
- ♦ z_to_a_acc_requests_received
- ♦ z_to_a_acc_requests_sent
- ♦ z_to_a_acc_sent_data
- ♦ z_to_a_bw_received_data_rate
- ♦ z_to_a_bw_requests_sent_rate
- ♦ z_to_a_bw_sent_data_rate
- ♦ z_to_a_ping_round_trip_time
- ♦ z_to_a_requests_processing_time
- ♦ z_to_a_requests_received_rate
- ♦ z_to_a_requests_round_trip_time

R-Volumes Object

Note: For more information about the R-Volumes object, see [Remote Protection Volumes](#) on page 417.

The Local-Protections object contains the following properties:

- ♦ a_end_ip_addr

- ♦ a_end_ip_addr_sn
- ♦ a_end_ip_link_id
- ♦ a_end_port_id
- ♦ a_end_sys_id
- ♦ a_end_xms_id
- ♦ a_to_z_acc_received_data
- ♦ a_to_z_acc_requests_received
- ♦ a_to_z_acc_requests_sent
- ♦ a_to_z_acc_sent_data
- ♦ a_to_z_bw_received_data_rate
- ♦ a_to_z_bw_requests_sent_rate
- ♦ a_to_z_bw_sent_data_rate
- ♦ a_to_z_ping_round_trip_time
- ♦ a_to_z_requests_processing_time
- ♦ a_to_z_requests_received_rate
- ♦ a_to_z_requests_round_trip_time
- ♦ certainty
- ♦ dropped_packets
- ♦ enabled_state
- ♦ ip_link_consistency_state
- ♦ ip_link_name
- ♦ ip_link_pairing_label_id
- ♦ ip_link_state
- ♦ link_rate
- ♦ obj_severity
- ♦ protocol
- ♦ z_end_ip_addr

Appendix B – RESTful API Changes

- ♦ z_end_ip_addr_sn
- ♦ z_end_ip_link_id
- ♦ z_end_port_id
- ♦ z_end_sys_id
- ♦ z_end_xms_id
- ♦ z_to_a_acc_received_data
- ♦ z_to_a_acc_requests_received
- ♦ z_to_a_acc_requests_sent
- ♦ z_to_a_acc_sent_data
- ♦ z_to_a_bw_received_data_rate
- ♦ z_to_a_bw_requests_sent_rate
- ♦ z_to_a_bw_sent_data_rate
- ♦ z_to_a_ping_round_trip_time
- ♦ z_to_a_requests_processing_time
- ♦ z_to_a_requests_received_rate
- ♦ z_to_a_requests_round_trip_time

Snapshot-Groups Object

Note: For more information about the Snapshot-Groups object, see [Snapshot Groups](#) on page 478.

The Snapshot-Groups object contains the following properties:

- ♦ calculate-savings-timestamp
- ♦ certainty
- ♦ consistency-state
- ♦ copy_efficiency
- ♦ data-reduction-ratio
- ♦ dest-snap-list

- ♦ guid
- ♦ index
- ♦ logical_space_in_use
- ♦ name
- ♦ num-of-internal-vols
- ♦ num-of-vols
- ♦ obj-severity
- ♦ reached_max_snapshots
- ♦ removing_snapshots_in_progress
- ♦ snapgrp-id
- ♦ sys-id
- ♦ sys-index
- ♦ sys-name
- ♦ thin_provisioning_ratio
- ♦ vol-list
- ♦ vol-size
- ♦ vol-type

Volume-Pairs Object

Note: For more information about the Volume-Pairs object, see [Volume Pairs](#) on page 639.

Changes from Ver. 6.1.0 to Ver. 6.2.0

New Objects

Consistency Group Copies

The Consistency Group Copies object contains an array of references to Snapshot-Sets which are copies of the specified Consistency Group.

Appendix B – RESTful API Changes

Debug-Info Object

Note: For more information about the Debug-Info object, see [Debug Information](#) on page 182.

The Debug-Info object contains the following properties:

- ♦ create-timestamp
- ♦ creation-status
- ♦ debug-level
- ♦ guid
- ♦ index
- ♦ name
- ♦ output-url
- ♦ start-timestamp
- ♦ sys-index
- ♦ sys-name
- ♦ with-perf-data
- ♦ with-vmcore

QoS-Policies Object

Note: For more information about the Qos-Policies object, see [Quality of Service \(QoS\) Policies](#) on page 353.

The Qos-Policies object contains the following properties:

- ♦ create-timestamp
- ♦ creation-status
- ♦ debug-level
- ♦ guid
- ♦ index
- ♦ name

- ♦ output-url
- ♦ start-timestamp
- ♦ sys-index
- ♦ sys-name
- ♦ with-perf-data
- ♦ with-vmcore

Syr-Notifier Object

Note: For more information about the Syr-Notifier object, see [Secure Remote Services Notifiers](#) on page 463.

The Syr-Notifier object contains the following properties:

- ♦ connectemc-config
- ♦ connection-type
- ♦ email-password
- ♦ email-sender
- ♦ email-server
- ♦ email-user
- ♦ enabled
- ♦ esrs-gw-host
- ♦ esrs-gw-host-secondary
- ♦ esrsve-polling-interval
- ♦ frequency
- ♦ guid
- ♦ index
- ♦ name
- ♦ obj-severity
- ♦ site-name
- ♦ sys-id

Appendix B – RESTful API Changes

- ♦ xms-id

Volume-Copies

The Volume-Copies object contains an array of references to Volumes which are copies (Snapshots) of the specified Volume.

Volumes-Savings

The Volumes-Savings object contains the following properties:

- ♦ data-reduction-ratio
- ♦ calculate-savings-timestamp
- ♦ snapgrp-unique-physical-space

New XtremIO RESTful API Commands

Volumes Commands

Note: For more information about XtremIO RESTful API Commands, including command syntax and descriptions of each command, see [XtremIO RESTful API Commands](#) on page 13.

The Volumes command object type includes the following new command:

- ♦ modify-performance-data-collection

Parameter Changes by Object

The following table lists the XtremIO Storage Array RESTful API parameters that have changed from version 6.1.0 to version 6.2.0:

Table 70: Clusters

Parameter	Added	Removed	Changed
volume-performance-data-collection	Yes	No	N/A

Table 71: Consistency Groups

Parameter	Added	Removed	Changed
application-type	Yes	No	N/A
qos-effective-bw	Yes	No	N/A
qos-effective-max-bw	Yes	No	N/A
qos-enabled-mode	Yes	No	N/A
qos-exceeded-bw	Yes	No	N/A
qos-exceeded-iops	Yes	No	N/A
qos-implicit-obj-list	Yes	No	N/A
qos-policy-id	Yes	No	N/A

Table 72: DAE-Controllers

Parameter	Added	Removed	Changed
sas1-port-enabled-state	Yes	No	N/A
sas2-port-enabled-state	Yes	No	N/A

Appendix B – RESTful API Changes

Table 73: Initiator-Groups

Parameter	Added	Removed	Changed
qos-effective-bw	Yes	No	N/A
qos-effective-max-bw	Yes	No	N/A
qos-enabled-mode	Yes	No	N/A
qos-exceeded-bw	Yes	No	N/A
qos-exceeded-iops	Yes	No	N/A
qos-implicit-obj-list	Yes	No	N/A
qos-policy-id	Yes	No	N/A

Table 74: Performance Object

Object	Parameter	Added	Removed	Changed
Cluster	acc_num_of_rd_io_128kb	Yes	No	N/A
Cluster	acc_num_of_rd_io_1mb	Yes	No	N/A
Cluster	acc_num_of_rd_io_256kb	Yes	No	N/A
Cluster	acc_num_of_rd_io_512kb	Yes	No	N/A
Cluster	acc_num_of_rd_io_64kb	Yes	No	N/A
Cluster	acc_num_of_rd_io_gt1mb	Yes	No	N/A
Cluster	acc_num_of_wr_io_128kb	Yes	No	N/A
Cluster	acc_num_of_wr_io_1mb	Yes	No	N/A
Cluster	acc_num_of_wr_io_256kb	Yes	No	N/A
Cluster	acc_num_of_wr_io_32kb	Yes	No	N/A
Cluster	acc_num_of_wr_io_512kb	Yes	No	N/A
Cluster	acc_num_of_wr_io_64kb	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Parameter	Added	Removed	Changed
Cluster	acc_num_of_wr_io_gt1mb	Yes	No	N/A
Cluster	compression_factor_text	Yes	No	N/A
Cluster	data_reduction_ratio_text	Yes	No	N/A
Cluster	dedup_ratio_text	Yes	No	N/A
Cluster	free_logical_space_in_base10	No	Yes	N/A
Cluster	free_ud_ssd_space_in_base10	No	Yes	N/A
Cluster	logical_space_in_use_in_base10	No	Yes	N/A
Cluster	qos_exceeded_bw	Yes	No	N/A
Cluster	replication_rd_bw_kbps	Yes	No	N/A
Cluster	replication_rd_iops_16kb	Yes	No	N/A
Cluster	replication_wr_bw_kbps	Yes	No	N/A
Cluster	replication_wr_iops_16kb	Yes	No	N/A
Cluster	shared_memory_in_use_ratio_level	Yes	No	N/A
Cluster	udssd_space_in_use_in_base10	No	Yes	N/A
Cluster	volume_size_in_base10	No	Yes	N/A
ConsistencyGroup	acc_num_of_rd	Yes	No	N/A
ConsistencyGroup	acc_num_of_wr	Yes	No	N/A
ConsistencyGroup	acc_size_of_rd	Yes	No	N/A
ConsistencyGroup	acc_size_of_wr	Yes	No	N/A
ConsistencyGroup	avg_latency	Yes	No	N/A
ConsistencyGroup	bw	Yes	No	N/A
ConsistencyGroup	iops	Yes	No	N/A
ConsistencyGroup	qos_exceeded_bw	Yes	No	N/A
ConsistencyGroup	qos_exceeded_iops	Yes	No	N/A
ConsistencyGroup	rd_bw	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Parameter	Added	Removed	Changed
ConsistencyGroup	rd_iops	Yes	No	N/A
ConsistencyGroup	rd_latency	Yes	No	N/A
ConsistencyGroup	wr_bw	Yes	No	N/A
ConsistencyGroup	wr_iops	Yes	No	N/A
ConsistencyGroup	wr_latency	Yes	No	N/A
Initiator	qos_exceeded_bw	Yes	No	N/A
Initiator	qos_exceeded_iops	Yes	No	N/A
InitiatorGroup	qos_exceeded_bw	Yes	No	N/A
InitiatorGroup	qos_exceeded_iops	Yes	No	N/A
ReplicationSession	acc_num_of_rd	Yes	No	N/A
ReplicationSession	acc_num_of_wr	Yes	No	N/A
ReplicationSession	acc_size_of_rd	Yes	No	N/A
ReplicationSession	acc_size_of_wr	Yes	No	N/A
ReplicationSession	avg_latency_16kb	Yes	No	N/A
ReplicationSession	bw	Yes	No	N/A
ReplicationSession	eth_kbytes_rx	Yes	No	N/A
ReplicationSession	eth_kbytes_tx	Yes	No	N/A
ReplicationSession	eth_pkt_rx	Yes	No	N/A
ReplicationSession	eth_pkt_rx_crc_error	Yes	No	N/A
ReplicationSession	eth_pkt_rx_no_buffer_error	Yes	No	N/A
ReplicationSession	eth_pkt_tx	Yes	No	N/A
ReplicationSession	eth_pkt_tx_error	Yes	No	N/A
ReplicationSession	iops	Yes	No	N/A
ReplicationSession	rd_bw	Yes	No	N/A
ReplicationSession	rd_latency	Yes	No	N/A
ReplicationSession	wr_bw	Yes	No	N/A
ReplicationSession	wr_iops	Yes	No	N/A
ReplicationSession	wr_latency	Yes	No	N/A
SSD	percent_endurance_remaining_level	Yes	No	N/A
TargetGroup	acc_num_of_rd	Yes	No	N/A
TargetGroup	acc_num_of_small_rd	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Parameter	Added	Removed	Changed
TargetGroup	acc_num_of_small_wr	Yes	No	N/A
TargetGroup	acc_num_of_unaligned_rd	Yes	No	N/A
TargetGroup	acc_num_of_unaligned_wr	Yes	No	N/A
TargetGroup	acc_num_of_wr	Yes	No	N/A
TargetGroup	bw	Yes	No	N/A
TargetGroup	iops	Yes	No	N/A
TargetGroup	rd_bw	Yes	No	N/A
TargetGroup	rd_iops	Yes	No	N/A
TargetGroup	small_bw	Yes	No	N/A
TargetGroup	small_iops	Yes	No	N/A
TargetGroup	small_rd_bw	Yes	No	N/A
TargetGroup	small_rd_iops	Yes	No	N/A
TargetGroup	small_wr_bw	Yes	No	N/A
TargetGroup	small_wr_iops	Yes	No	N/A
TargetGroup	unaligned_bw	Yes	No	N/A
TargetGroup	unaligned_iops	Yes	No	N/A
TargetGroup	unaligned_rd_bw	Yes	No	N/A
TargetGroup	unaligned_rd_iops	Yes	No	N/A
TargetGroup	unaligned_wr_bw	Yes	No	N/A
TargetGroup	unaligned_wr_iops	Yes	No	N/A
TargetGroup	wr_bw	Yes	No	N/A
TargetGroup	wr_iops	Yes	No	N/A
Volume	qos_exceeded_bw	Yes	No	N/A
Volume	qos_exceeded_iops	Yes	No	N/A
Volume	rep_bw	Yes	No	N/A
Volume	replication_rd_bw_kbps	Yes	No	N/A
Volume	replication_rd_iops_16kb	Yes	No	N/A
Volume	replication_wr_bw_kbps	Yes	No	N/A
Volume	replication_wr_iops_16kb	Yes	No	N/A
Volume	small_io_ratio_level	Yes	No	N/A

Appendix B – RESTful API Changes

Object	Parameter	Added	Removed	Changed
Volume	unaligned io_ratio_level	Yes	No	N/A
Xms	Bw	Yes	No	N/A
Xms	bw_by_block	Yes	No	N/A
Xms	iops	Yes	No	N/A
Xms	iops_by_block	Yes	No	N/A
Xms	rd_bw	Yes	No	N/A
Xms	rd_bw_by_block	Yes	No	N/A
Xms	rd_iops	Yes	No	N/A
Xms	rd_iops_by_block	Yes	No	N/A
Xms	rd_latency	Yes	No	N/A
Xms	wr_bw	Yes	No	N/A
Xms	wr_bw_by_block	Yes	No	N/A
Xms	wr_iops	Yes	No	N/A
Xms	wr_iops_by_block	Yes	No	N/A
Xms	wr_latency	Yes	No	N/A

Table 75: Storage-Controllers

Parameter	Added	Removed	Changed
ib1-port-enabled-state	Yes	No	N/A
ib2-port-enabled-state	Yes	No	N/A
sas1-port-enabled-state	Yes	No	N/A
sas2-port-enabled-state	Yes	No	N/A

Table 76: Targets

Parameter	Added	Removed	Changed
port-enabled-state	Yes	No	N/A

Table 77: Volumes

Parameter	Added	Removed	Changed
application-type	Yes	No	N/A
qos-effective-bw	Yes	No	N/A

Appendix B – RESTful API Changes

Parameter	Added	Removed	Changed
qos-effective-max-bw	Yes	No	N/A
qos-enabled-mode	Yes	No	N/A
qos-exceeded-bw	Yes	No	N/A
qos-exceeded-iops	Yes	No	N/A
qos-implicit-obj-list	Yes	No	N/A
qos-policy-id	Yes	No	N/A
performance-data-collection	Yes	No	N/A

Table 78: XMS

Parameter	Added	Removed	Changed
cloud-iq-reporting	Yes	No	N/A
max-repeating-alert	Yes	No	N/A
max-xms-clusters	Yes	No	N/A
max-xms-objects-per-tag	Yes	No	N/A
max-xms-tags-per-object	Yes	No	N/A
max-xms-volumes	Yes	No	N/A
num-of-user-accounts	Yes	No	N/A
top-n-igs-by-bw	Yes	No	N/A
top-n-igs-by-iops	Yes	No	N/A
top-n-volumes-by-latency	Yes	No	N/A
xms-num-of-volumes-level	Yes	No	N/A

Appendix C – RESTful API Examples

Appendix C – RESTful API Examples

This section provides examples of the RESTful API requests. The examples are organized by type:

- ♦ generic commands
- ♦ common use-cases
- ♦ provisioning flows.

Note: The RESTful API examples are shown using the Linux `curl` command.

Generic Command Examples

Show Objects

Command	Example
Show all available objects	<code>curl -k 'https://user:password@XMSName/api/json/v3/types'</code>
Show object list	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/volumes/'</code>

Show Object Properties

Command	Example
Show object properties by object GUID	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/volumes/9ab890d07a1d4799a2b984b82e0f372f'</code>
Show object properties by object index	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/volumes/1'</code>
Show object properties by object name	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/volumes?name=test'</code>
Show object properties for all objects	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/volumes?full=1'</code>

Filter Output Objects

Command	Example
Show Volumes containing "test1" in the vol-name	curl -k 'https://user:password@XMSName/api/json/v3/types/volumes/?filter=name:like:test1'
Show LUN mapping for Volumes containing "PRD01" in the vol-name	curl -k 'https://user:password@XMSName/api/json/v3/types/lun-maps?filter=vol-name:like:PRD01'

Display Specific Properties per Object

Command	Example
Show the "rd-iops" properties of the Volume named "test2"	curl -k 'https://user:password@XMSName/api/json/v3/types/volumes?name=test2&prop=name&prop=vol-access&prop=rd-iops'

Multi Cluster Management

Command	Example
Use cluster name in a GET URI	curl -k 'https://user:password@XMSName/api/json/v3/types/volumes/1?cluster-name=xbrick26'
Use cluster index in a GET URI	curl -k 'https://user:password@XMSName/api/json/v3/types/volumes/1?cluster-index=1'
Use cluster index in a POST body	curl -k -X POST -d '{"cluster-id":1, "ig-id":2, "vol-id":141}' 'https://user:password@XMSName/api/json/v3/types/lun-maps'

Note: Objects using object GUID identifiers do not require a cluster name or cluster index.

Appendix C – RESTful API Examples

Common Use-Cases Examples

Volume Management

Command	Example
Add a new Volume	<code>curl -k -X POST -d '{"vol-name": "test1", "vol-size": "1G"}'</code> <code>'https://user:password@XMSName/api/json/v3/types/volumes/'</code>
Remove a Volume	<code>curl -k -X DELETE</code> <code>'https://user:password@XMSName/api/json/v3/types/volumes/e0096ab7c6d849059f66c8037f833e64'</code>
Rename a Volume	<code>curl -k -X PUT -d '{"name": "new-test"}'</code> <code>'https://user:password@XMSName/api/json/v3/types/volumes/3b1e0ad534ca49dcb6908e5c8d73823a'</code>
Add a Volume and set the "management locked" flag to "enabled"	<code>curl -k -X POST -d '{"vol-name": "test1", "vol-size": "1G", "management-locked": "enabled"}'</code> <code>'https://user:password@XMSName/api/json/v3/types/volumes/'</code>
Disable the "management locked" flag for existing Volume	<code>curl -k -X PUT -d '{"management-locked": "disabled"}'</code> <code>'https://user:password@XMSName/api/json/v3/types/volumes/8bcbb847dd4b4ae489acefbe67f320f5'</code>
Enable the "management locked" flag for existing Volume	<code>curl -k -X PUT -d '{"management-locked": "enabled"}'</code> <code>'https://user:password@XMSName/api/json/v3/types/volumes/8bcbb847dd4b4ae489acefbe67f320f5'</code>
View a list of copies of a Volume	<code>curl -k</code> <code>'https://user:password@XMSName/api/json/v3/types/volume-copies/b7997f509ff042eb8528f494deaf171a'</code>
Enable performance data collection for a list of Volumes (if performance data collection is disabled at the cluster level)	<code>curl -k -X PUT -d '{"collection-mode": "enabled", "vol-list": ["TW-01"]}'</code> <code>'https://user:password@XMSName/api/json/v3/types/modify-performance-data-collection'</code>
Modify the performance data collection enable state for a list of Volumes	<code>curl -k -X PUT -d '{"collection-mode": "inherit_from_cluster", "vol-list": ["TW-01"]}'</code> <code>'https://user:password@XMSName/api/json/v3/types/modify-performance-data-collection'</code>

Setting the Management Lock for All Volumes in a Consistency Group

Command	Example
Set the management-lock property for all Volumes in a Consistency Group whose object GUID identifier is "f8e1dce66e74453cb7cbf25c6602c636"	<pre>curl -k -X PUT -d '{"management-locked":"enabled"}' 'https://user:password@XMSName/api/json/v3/types/consistency-groups/f8e1dce66e74453cb7cbf25c6602c636'</pre>

Initiator-Group Management

Command	Example
Add an Initiator Group with new initiators	<pre>curl -k -X POST -d '{"ig-name":"PRD-1", "initiator-list": [{"initiator-name": "PRD-2", "port-address":"20:01:00:0e:1e:c2:cd:4d"}, {"initiator-name": "test2", "port-address":"20:01:00:0e:1e:c2:cd:4c"}], "cluster-id":1}' 'https://user:password@XMSName/api/json/v3/types/initiator-groups/'</pre>
Modify (rename) an Initiator Group	<pre>curl -k -X PUT -d '{"new-name": "PRD-1-New"}' 'https://user:password@XMSName/api/json/v3/types/initiator-groups/d997e92547d8433f85c3d1363ca74022'</pre>

LUN Mapping

Command	Example
Show LUN mapping per Volume	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/lun-maps?filter=vol-name:eq:volspider1'</pre>
Add LUN mapping to a Volume	<pre>curl -k -X POST -d '{"ig-id":"lgdrml841", "vol-id":"test1"}' 'https://user:password@XMSName/api/json/v3/types/lun-maps'</pre>
Remove LUN mapping from a Volume	<pre>curl -k -X DELETE 'https://user:password@XMSName/api/json/v3/types/lun-maps/3bfb646533304ab2823c275e07ca9c80'</pre>

Appendix C – RESTful API Examples

TAG management

Command	Example
Show Tags	<code>curl -k 'https://user:password@XMSName/api/json/types/tags/'</code>
Show Tags for GUID identifier "e6f937b354ee48a08d1cb4a9de6d11bc"	<code>curl -k 'https://user:password@XMSName/api/json/types/tags/e6f937b354ee48a08d1cb4a9de6d11bc'</code>
Create a new Tag	<code>curl -k -X POST -d '{"entity":"Volume","tag-name":"newtag1"}' 'https://user:password@XMSName/api/json/v3/types/tags'</code>
Tag the Volume whose Id is 1 with Tag Id 5.	<code>curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","tag-id":5,"entity":"Volume","entity-details":1}' 'https://user:password@XMSName/api/json/v3/commands/tags/tag-object'</code>
Remove the Tag whose Id is 5 (untag) the Volume Id whose Id is 1.	<code>curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","tag-id":5,"entity":"Volume","entity-details":1}' 'https://user:password@XMSName/api/json/v3/commands/tags/untag-object'</code>
Tag the InitiatorGroup whose Id is 4 with Tag Id 7.	<code>curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","tag-id":7,"entity":"InitiatorGroup","entity-details":4}' 'https://user:password@XMSName/api/json/v3/commands/tags/tag-object'</code>
Remove the Tag whose Id is 7 (untag) the InitiatorGroup whose Id is 4.	<code>curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","tag-id":7,"entity":"InitiatorGroup","entity-details":4}' 'https://user:password@XMSName/api/json/v3/commands/tags/untag-object'</code>
Delete the Tag whose GUID is "3451a212605e4305aea6f75eef3f0d30"	<code>curl -k -X DELETE 'https://user:password@XMSName/api/json/v3/types/tags/3451a212605e4305aea6f75eef3f0d30'</code>

XtremIO Virtual Copies Management

Command	Example
Create a Consistency Group named "PrdCG"	<pre>curl -k -X POST -d '{"vol-list": [28, 29, 31, 33], "consistency-group-name": "CG-TW.0001"}' 'https://user:password@XMSName/api/json/v3/types/consistency-groups'</pre>
Add Volume ID "1" to a Consistency Group named "PrdCG"	<pre>curl -k -X PUT -d '{"cg-id": "CG-TW.0001", "vol-id": "test24"}' 'https://user:password@XMSName//api/json/v3/commands/consistency-groups/add-volume'</pre>
Add a new Copy Volume to a linked Consistency Group	<pre>curl -k -X PUT -d '{"cluster-id": "xbrickdrm1648", "reference-cg": "PRD-CG", "reference-volume": "PRD06", "volume-name-suffix-list": ["copy-volume-suffix"], "cg-list": ["PRD-CG-REP01"]}' 'https://user:password@XMSName/api/json/v3/commands/consistency-groups/add-copy-volume-to-consistency-groups'</pre> Note: In this example, the add-copy-volume-to-consistency-groups command is used to add the new Copy Volume PRD06-copy-volume-suffix to the linked Consistency Group PRD-CG-REP01.
Remove a Copy Volume from a linked Consistency Group	<pre>curl -k -X PUT --d '{"cluster-id": "xbrickdrm1648", "cg-id": "PRD-CG-REP01", "vol-id": "PRD06.copy-volume-suffix"}' 'https://user:password@XMSName/api/json/v3/commands/consistency-groups/remove-volume'</pre> Note: In this example, the remove-volume command is used to remove the Copy Volume PRD06.copy-volume-suffix from the linked Consistency Group PRD-CG-REP01.
Add an existing Copy Volume to a linked Consistency Group	<pre>curl -k -X PUT -d '{"cluster-id": "xbrickdrm1648", "cg-id": "PRD-CG-REP01", "vol-id": "PRD06.copy-volume-suffix", "reference-volume-id": "PRD06"}' 'https://user:password@XMSName//api/json/v3/commands/consistency-groups/add-volume'</pre> Note: In this example, the add-volume command is used to add the Copy Volume PRD06-copy-volume-suffix to the linked Consistency Group PRD-CG-REP01.
Show SnapshotSets	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/snapshot-sets'</pre>
Show the SnapshotSets whose GUID is "fd4b5d7c5f9c48e8b27a5d261cc44f9a"	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/snapshot-sets/7674213f744c42ca8dc8df88eea06c03'</pre>

Appendix C – RESTful API Examples

Command	Example
Delete a SnapshotSet	<pre>curl -k -X DELETE 'https://user:password@XMSName/api/json/v3/types/ snapshot-sets/fd4b5d7c5f9c48e8b27a5d261cc44f9a'</pre>

Create a Repurpose Copy

Command	Example
Create a Repurpose Copy from a Consistency Group (create a Consistency Group with regular Volumes)	<pre>curl -k -X PUT -d '{"from-consistency-group-id":"CG-TW.0001","new-consistency-group-name":"CG-TW.0002"}' 'https://user:password@XMSName/api/json/v3/commands/consistency-groups/create-repurpose-copy'</pre>
Create a Repurpose Copy from a Volume (create a SnapshotSet with regular Volumes)	<pre>curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","from-volume-list":["TW.0024"],"new-vol-suffix":"TW.0024.DEV"}' 'https://user:password@XMSName/api/json/v3/commands/volumes/create-repurpose-copy'</pre>

Create a Protection Copy

Command	Example
Create a Protection Copy from a Consistency Group (create a SnapshotSet with readonly Volumes)	<pre>curl -k -X PUT -d '{"from-consistency-group-id":"CG-TW.0001","cluster-id":"xbrickdrm919"}' 'https://user:password@XMSName/api/json/v3/commands/consistency-groups/create-protection-copy'</pre>
Create a Protection Copy from a Volume (create Snapshot Set with readonly Volumes)	<pre>curl -k -X PUT -d '{"from-volume-list":["test34"],"cluster-id":"xbrickdrm919"}' 'https://user:password@XMSName/api/json/v3/commands/volumes/create-protection-copy'</pre>
Create a Protection Copy from a Snapshot-Set (create Snapshot Set with readonly Volumes)	<pre>curl -k -X PUT -d '{"from-snapshot-set-id":"shay.SS01","cluster-id":"xbrickdrm919"}' 'https://user:password@XMSName/api/json/v3/commands/snapshot-sets/create-protection-copy'</pre>

Refresh a Repurpose Copy

Command	Example
Refresh a Repurpose Copy – From Volume to Volume	<code>curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","from-volume-id":"TW.0024.DEV","to-volume-id":"TW.0024"}' 'https://user:password@XMSName/api/json/v3/commands/volumes/refresh-data'</code>
Refresh a Repurpose Copy – From Consistency Group to Consistency Group	<code>curl -k -X PUT -d '{"cluster-id":"xrickdrm919","from-consistency-group-id":"CG-TW.0002.DEV","to-consistency-group-id":"CG-TW.0002"}' 'https://user:password@XMSName/api/json/v3/commands/consistency-groups/refresh-data'</code>
Refresh a Repurpose Copy – Dry-Run (show pairing relationships only, without actual refresh)	<code>curl -k -X PUT -d '{"cluster-id":"xrickdrm919","from-consistency-group-id":"CG-TW.0002.DEV","to-consistency-group-id":"CG-TW.0002","dry-run":"true"}' 'https://user:password@XMSName/api/json/v3/commands/consistency-groups/refresh-data'</code>

Restore from a Protection Copy

Command	Example
Refresh a Repurpose Copy – From Volume to Volume	<code>curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","from-volume-id":"test8.TEST","to-volume-id":"test8"}' 'https://user:password@XMSName/api/json/v3/commands/volumes/refresh-data'</code>
Refresh a Repurpose Copy – From SnapshotSet to Consistency Group	<code>curl -k -X PUT -d '{"cluster-id":"xrickdrm919","from-snapshot-set-id":"CG-TW.0003.TEST","to-consistency-group-id":"CG-TW.0003"}' 'https://user:password@XMSName/api/json/v3/commands/consistency-groups/refresh-data'</code>

Appendix C – RESTful API Examples

Multiple Linked Consistency Group Volumes Management

Note: The prerequisites for the commands shown below are that the Consistency Group "PrdCG" contains two Volumes, and the linked Consistency Groups "PrdCG-DEV01", "PrdCG-DEV02", and "PrdCG-DEV03" were created from "PrdCG".

Command	Example
Add a new Volume "PrdVol3" to the Consistency Group "PrdCG"	<pre>curl -k -X PUT -d '{"cluster-id":"xbrickdrm1648","cg-id":"PrdCG ","vol-id":"PrdVol3"}'</pre> <pre>'https://user:password@XMSName/api/json/v3/commands/consistency-groups/add-volume'</pre> Note: After this operation executes, "PrdCG" contains one more Volume than "PrdCG-DEV01", "PrdCG-DEV02", and "PrdCG-DEV03". That additional Volume is "PrdVol3".
Add a copy Volume to each one of linked Consistency Groups	<pre>curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","reference-cg":"PrdCG","reference-volume":"PrdVol3","volume-name-suffix-list":["PrdCG-DEV01-copy","PrdCG-DEV02-copy","PrdCG-DEV03-copy"],"cg-list":["PrdCG-DEV01","PrdCG-DEV02","PrdCG-DEV03"]}'</pre> <pre>'https://user:password@XMSName/api/json/v3/commands/consistency-groups/add-copy-volume-to-consistency-groups'</pre> Note: The Volume suffixes specified in the volume-name-suffix-list parameter are appended to the names of new copy Volumes specified in the cg-list parameter in the corresponding order. For example, the first suffix in volume-name-suffix-list is appended to the first Consistency Group in cg-list, the second suffix in volume-name-suffix-list is appended to the second Consistency Group in cg-list, and so forth.

Scheduler Management

Command	Example
Create a new Scheduler	<pre>curl -k -X POST -d '{"cluster-id":"xbrickdrm919","scheduling-type":"interval","snapshot-object-id":"test100","snapshot-object-type":"Volume","snapshots-to-keep-number":2,"time":"10:20:15"}' 'https://user:password@XMSName/api/json/v3/types/schedulers'</pre>
Enable an existing Scheduler	<pre>curl -k -X PUT -d '{"state": "enabled"}' 'https://user:password@XMSName/api/json/v3/types/schedulers/0b898c3374834f6b8ca3c6d8de743aeb'</pre>
Suspend a Scheduler	<pre>curl -k -X PUT -d '{}' 'https://user:password@XMSName/api/json/v3/commands/schedulers/suspend/0b898c3374834f6b8ca3c6d8de743aeb'</pre>
Resume a Scheduler	<pre>curl -k -X PUT -d '{}' 'https://user:password@XMSName/api/json/v3/commands/schedulers/resume/0b898c3374834f6b8ca3c6d8de743aeb'</pre>

Notifiers Management

Command	Example
Show Email Notifiers	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/email-notifier'</pre>
Show the Email Notifier whose GUID is "0602139a289e4c27b426d1edc7e8179f"	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/email-notifier/0602139a289e4c27b426d1edc7e8179f'</pre>
Modify an EMAIL notifier	<pre>curl -k -X PUT -d '{"mail-password": "123456", "mail-relay-address": "foo.bar.com", "mail-user": "joe", "recipient-list": ["foo@bar.com", "bar@baz.com"]}' 'https://user:password@vxms-xbrickdrm919/api/json/v3/types/email-notifier/0602139a289e4c27b426d1edc7e8179f'</pre>
Show SNMP Notifiers	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/snmp-notifier'</pre>
Show the SNMP Notifier whose GUID is "81f31634d3634fe7806890a1e36cebd9"	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/snmp-notifier/81f31634d3634fe7806890a1e36cebd9'</pre>

Appendix C – RESTful API Examples

Command	Example
Change an SNMP Notifier	<pre>curl -k -X PUT -d '{"recipient-list": ["foo.bar.com"]}' 'https://user:password@XMSName/api/json/v3/types/sn mp-notifier/81f31634d3634fe7806890a1e36cebd9'</pre>
Show Syslog Notifiers	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/ syslog-notifier'</pre>
Show the Syslog Notifier whose GUID is "45c737e18704468990dc9a0958baf3ba"	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/ syslog-notifier/45c737e18704468990dc9a0958baf3ba'</pre>
Change a Syslog Notifier	<pre>curl -k -X PUT -d '{"enable": "true", "targets": ["foo.bar.com"]}' 'https://user:password@XMSName/api/json/v3/types/ syslog-notifier/45c737e18704468990dc9a0958baf3ba'</pre>
Show EMC Secure Remote Services Notifiers	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/ syr-notifiers'</pre>
Show the EMC Secure Remote Services Notifiers whose GUID is "32805dc91ae14a06bd28ad741dc152d3"	<pre>curl -k 'https://user:password@XMSName/api/json/v3/types/ syr-notifiers/32805dc91ae14a06bd28ad741dc152d3'</pre>
Change an EMC Secure Remote Services Notifier	<pre>curl -k -X PUT -d '{"frequency": "43200", "esrsve- polling-interval": "12"}' 'https://user:password@XMSName/api/json/v3/types/ syr-notifiers/32805dc91ae14a06bd28ad741dc152d3'</pre>

User Authentication Management

Command	Example
Show User Accounts	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/user-accounts'</code>
Show the User Account whose GUID is "fbecdb6a0bd84693895a841a67c546a5"	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/user-accounts/fbecdb6a0bd84693895a841a67c546a5'</code>
Add a User Account	<code>curl -k -X POST -d '{"usr-name": "joe", "role": "read_only", "password": "123456"}' 'https://user:password@XMSName/api/json/v3/types/user-accounts'</code>
Edit a User Account	<code>curl -k -X PUT -d '{"usr-name": "joey"}' 'https://user:password@XMSName/api/json/v3/types/user-accounts/3f150d8f926740e2ac1d022efac04e61'</code>
Delete a User Account	<code>curl -k -X DELETE 'https://user:password@XMSName/api/json/v3/types/user-accounts/3f150d8f926740e2ac1d022efac04e61'</code>

LDAP Configurations

Command	Example
Show LDAP configurations	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/ldap-configs'</code>
Show the LDAP configuration whose GUID is "6ccc6ff902a74630ae5ef45962455e35"	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/ldap-configs/6ccc6ff902a74630ae5ef45962455e35'</code>
Add a new LDAP configuration	<code>curl -k -X POST -d '{"server-urls": ["ldap://foo.bar.com", "ldap://bar.baz.com"], "roles": ["admin:dc=a,dc=b"], "search-filter": "sam={username}"}' 'https://user:password@XMSName/api/json/v3/types/ldap-configs'</code>
Change an LDAP configuration	<code>curl -k -X PUT -d '{"search-filter": "sam={username}"}' 'https://user:password@XMSName/api/json/v3/types/ldap-configs/6ccc6ff902a74630ae5ef45962455e35'</code>
Delete an LDAP configuration	<code>curl -k -X DELETE 'https://user:password@XMSName/api/json/v3/types/ldap-configs/6ccc6ff902a74630ae5ef45962455e35'</code>

Appendix C – RESTful API Examples

Alert Management

Command	Example
Show Alerts	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/alert-definitions'</code>
Show Alerts Definition for Alert volume_modify_pending	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/alert-definitions/volume_modify_pending'</code>
Change an Alert Severity to "minor"	<code>curl -k -X PUT -d '{"severity": "information"}' 'https://user:password@XMSName/api/json/v3/types/alert-definitions/alert_def_small_io_ratio_high'</code>

Performance Reports

Command	Example
Show a Performance Report:	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/performance?entity=Cluster&granularity=one_day&time-frame=last_week&prop=avg_bw'</code>

Quality of Service Policy Management

Note: The Quality of Service Policy common use case examples in this section use Volume objects. These commands can also be applied to Consistency Groups (see [Modifying a Consistency Group's Quality of Service Policy](#) on page 133) and Initiator-Groups (see [Modifying an Initiator Group](#) on page 250).

Command	Example
Assigning a QoS Policy to a Volume	<code>curl -k -X PUT -d '{"qos-policy-id":1,"qos-enabled-mode":"monitor_only"}' 'https://user:password@XMSName/api/json/v3/types/volumes/c3c259e27f5949fab8f2734c3c2f314b'</code>
Setting a QoS Policy for a Volume to monitor only	<code>curl -k -X PUT -d '{"qos-policy-id":1,"qos-enabled-mode":"enabled"}' 'https://user:password@XMSName/api/json/v3/types/volumes/c3c259e27f5949fab8f2734c3c2f314b'</code>
Removing a QoS Policy from a Volume	<code>curl -k -X PUT -d '{"qos-policy-id":1,"remove-qos-policy":"true"}' 'https://user:password@XMSName/api/json/v3/types/volumes/c3c259e27f5949fab8f2734c3c2f314b'</code>

Savings Metrics Commands

Command	Example
Calculate savings metrics for Consistency Groups	<code>curl -k -X PUT -d {"cg-list":["eaf217691eca4faca5a948a2115b65b6"]}} /api/json/v3/commands/snapshot-groups/calculate-savings</code>
Calculate savings metrics for Volumes	<code>curl -k -X PUT -d {"vol-list":["b7997f509ff042eb8528f494deaf171a"]}} /api/json/v3/commands/snapshot-groups/calculate-savings</code>
List Volumes whose saving metrics have been calculated	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/volumes-savings/'</code>
View a Volume's savings metric	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/volumes-savings?full=1&filter=guid:eq:b7997f509ff042eb8528f494deaf171a&prop=data-reduction-ratio&prop=calculate-savings-timestamp&prop=snapgrp-unique-physical-space'</code>

Debug Information

Command	Example
Show Debug Information Log Bundles	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/debug-info'</code>
Show the Debug Information Log Bundle whose GUID is "c431000c08794082ad8fe4d8ec901202"	<code>curl -k 'https://user:password@XMSName/api/json/v3/types/debug-info/c431000c08794082ad8fe4d8ec901202'</code>

Appendix C – RESTful API Examples

Provisioning Flow Examples

Create a Volume

This is an example of creating a Volume named "PrdVol1".

Command

```
curl -k -X POST -d '{"cluster-id":"xbrickdrm919","vol-name":"PrdVol1","vol-size":"8m"}' 'https://user:password@XMSName/api/json/v3/types/volumes'
```

Response

```
{
  "links": [
    {
      "guid": "2803203ae86a4e16a6c2e592988fc208",
      "href": "https://vxms-
xbrickdrm919/api/json/v3/types/volumes/2803203ae86a4e16a6c2e592988fc208",
      "rel": "self"
    }
  ]
}
```

Show Cluster Initiator Groups

This is an example of showing Initiator Groups for a cluster.

Command

```
curl -k 'https://user:password@XMSName/api/json/v3/types/initiator-groups?cluster-name=xbrickdrm919'
```

Response

```
{
  "initiator-groups": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/initiator-groups/855f6376e12e490daff535cf20c26729",
      "name": "lgdrm1841"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/initiator-groups/7263bdee222148cbb4fb38ede780959",
      "name": "lgdrm1842"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/initiator-groups/59397279085d4af08093699a152673bc",
      "name": "PS_TG"
    },
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/initiator-groups/d997e92547d8433f85c3d1363ca74022",
      "name": "PRD-1-New"
    }
  ],
  "links": [
    {
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/initiator-groups/",
      "rel": "self"
    }
  ]
}
```

Appendix C – RESTful API Examples

MAP a Volume to an Initiator Group Using the Volume Name

This is an example of mapping the Volume named "PrdVol1" to the Initiator Group named "lgdrm1700" using the Volume name.

Command

```
curl -k -X POST -d '{"cluster-id":"xbrickdrm919","vol-id":"PrdVol1","ig-id":"lgdrm1841"}' 'https://user:password@XMSName/api/json/v3/types/lun-maps'
```

Response

```
{
  "links": [
    {
      "guid": "657c1ec5edcb48f6be8b5ef85e66020a",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/lun-maps/657c1ec5edcb48f6be8b5ef85e66020a",
      "rel": "self"
    }
  ]
}
```

Add a Volume to a Consistency Group Using the Volume Index

This is an example of adding the Volume named "PrdVol1" to the Consistency Group named "PrdCG" using the Volume index.

Command

```
curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","cg-id":"PrdCG","vol-id":"PrdVol1"}'  
'https://user:password@XMSName/api/json/v3/commands/consistency-groups/add-volume'
```

Response

Note: The successful completion of this command returns no response.

Create a Repurpose Copy

This is an example of creating a Repurpose Copy named " PrdCG ".

Command

```
curl -k -X PUT -d '{"cluster-id":"xbrickdrm919","from-consistency-group-id":"PrdCG","new-consistency-group-name":"PrdCG.DEV"}'  
'https://user:password@XMSName/api/json/v3/commands/consistency-groups/create-repurpose-copy'
```

Response

```
{  
  "content": {  
    "volumeIndex": [  
      105  
    ],  
    "newObjectId": 11  
  }  
}
```

Appendix C – RESTful API Examples

Show the Properties of a Consistency Group Including "vol-list"

This is an example of showing the properties of the Consistency Group named "PrdCG" including "vol-list".

Note: In this example, the GUID object identifier of the Consistency Group named "PrdCG" is "c7d9a873085f41e99441a3dbbebea20f"

Command

```
curl -k 'https://user:password@XMSName/api/json/v3/types/consistency-groups/c7d9a873085f41e99441a3dbbebea20f'
```

Response

```
{
  "content": {
    "creation-time": 1520330642838,
    "last-refreshed-from-obj-name": null,
    "num-of-snap-sets": 0,
    "last-refresh-from-obj-id": "7c2d52656e656e2048616c6c616b2d7c",
    "obj-severity": "information",
    "linked-consistency-group": "7c2d52656e656e2048616c6c616b2d7c",
    "created-by-app": "xms",
    "last-refresh-time": "1520330642838",
    "sys-index": 1,
    "linked-consistency-group-name": null,
    "num-of-vols": 3,
    "cg-id": [
      "c7d9a873085f41e99441a3dbbebea20f",
      "PrdCG",
      10
    ],
    "guid": "c7d9a873085f41e99441a3dbbebea20f",
    "vol-list": [
      [
        "2803203ae86a4e16a6c2e592988fc208",
        "PrdVol1",
        104
      ],
      [
        "8bcbb847dd4b4ae489acefb67f320f5",
        "test1",
        28
      ],
      [
        "2c3eb77f3354458fb6f97430c43c8c2b",
        "test2",
        29
      ]
    ],
    "sys-id": [
```

```

        "d3ef1c828b314a4f9562e9c1766ee49f",
        "xbrickdrm919",
        1
    ],
    "tag-list": [],
    "last-refreshed-from-obj-index": "",
    "index": 10,
    "name": "PrdCG",
    "created-by-external-client": "",
    "certainty": "ok",
    "cg-short-id": 9,
    "linked-consistency-group-index": "",
    "num-of-local-protections": 0,
    "sys-name": "xbrickdrm919"
  },
  "links": [
    {
      "guid": "c7d9a873085f41e99441a3dbbebea20f",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/consistency-
groups/c7d9a873085f41e99441a3dbbebea20f",
      "rel": "self"
    }
  ]
}

```

Map a Volume to a Second Host using the Index

This is an example of mapping the Volume named "PrdVol1.DEV-VOLUME" to a second host using the index.

Command

```
curl -k -X POST -d '{"cluster-id":"xbrickdrm919","vol-id":"PrdVol1","ig-id":"PRD-1-New"}' 'https://user:password@XMSName/api/json/v3/types/lun-maps'
```

Response

```

{
  "links": [
    {
      "guid": "35361da43c4e49bcb2288ff6b2faaa36",
      "href": "https://vxms-xbrickdrm919/api/json/v3/types/lun-
maps/35361da43c4e49bcb2288ff6b2faaa36",
      "rel": "self"
    }
  ]
}-

```

Appendix C – RESTful API Examples

Remote Protection Command Examples

Add a Remote Protection Peer XMS

Command	Example
Add a Remote Protection Peer XMS	<pre>curl -k -X PUT -d '{"remote-ip-addr":"10.102.68.193","remote-xms-alias-name":"vxms-xbrickdrm1652.xiodrm.lab.emc.com","remote-xms-user":"admin","remote-user-password":"xxxxxx"}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/xms/add-peer'</pre>

Add a Remote Protection IP Link

Command	Example
Add a Remote Protection IP Link	<pre>curl -k -X POST -d '{"source-cluster-id":"xbrickdrm1648","source-ip-addr-sn":"10.10.10.14/24","target-cluster-id":"xbrickdrm1652","target-ip-addr-sn":"10.10.10.10/24","ip-link-name":"rep-iplink1"}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/types/ip-links'</pre>

Add a Remote Protection Session

Command	Example
Add a Remote Protection Session	<pre>curl -k -X POST -d '{"source-consistency-group-id":"PRD-CG","auto-provision-target":"true","source-cluster-id":"xbrickdrm1648","target-cluster-id":"xbrickdrm1652","protection-session-name":"PRD-CG-Session","rpo":60}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/types/remote-protections'</pre>

Show Remote Snapshot-Sets for a Specific Protection Session

Command	Example
Show Remote Snapshot-Sets for a Specific Protection Session	<pre>curl -k 'https://user:password@vxms-xbrickdrm1648/api/json/v3/types/r-snapshot-sets?protection-session-id=c2ade4c4b38748978c392191e60b5288'</pre>

Manage a Remote Protection Session

Command	Example
Start	<code>curl -k -X PUT -d '{} 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/start/722180b157b9417fb296bcbbae746484'</code>
Replicate now	<code>curl -k -X PUT -d '{} 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/replicate-now/722180b157b9417fb296bcbbae746484'</code>
Test copy start	<code>curl -k -X PUT -d '{"snapshot-set-id":2020235}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/test-copy-start/c2ade4c4b38748978c392191e60b5288'</code>
Test copy finish	<code>curl -k -X PUT -d '{} 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/test-copy-finish/c2ade4c4b38748978c392191e60b5288'</code>
Failover with replication start in opposite direction	<code>curl -k -X PUT -d '{"snapshot-set-id":2034225,"start-replication-with-failover":true}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/failover/c2ade4c4b38748978c392191e60b5288'</code>
Remove ALL protection session's copies (except the last one)	<code>curl -k -X PUT -d '{} 'https://tech:X10Tech!@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/remove-snapshot-sets/c2ade4c4b38748978c392191e60b5288'</code>
Remove protection session's copies using a date and time range (except the last one)	<code>curl -k -X PUT -d '{"snapshot-sets-to-remove-since":"2018-03-11 14:40:00","snapshot-sets-to-remove-until":"2018-03-11 15:01:00"}' 'https://tech:X10Tech!@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/remove-snapshot-sets/c2ade4c4b38748978c392191e60b5288'</code>

Add Local and Remote Retention Policies to a Remote Protection Session

Command	Example

Appendix C – RESTful API Examples

Add local and remote retention policies to protection session:	<pre>curl -k -X PUT -d '{"protection-session-id":"PRD-CG-Session","source-retention-policy-id":"Tier1","target-retention-policy-id":"Local-Hourly","protection-window-compliance-alert":"enabled"}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/types/remote-protections/722180b157b9417fb296bcbbae746484'</pre>

Add a Volume Pair to a Remote Protection Session (Workflow)

Command	Example
Create new Volume on both the source and target clusters	<pre>curl -k -X POST -d '{"vol-name":"PRD04","vol-size":"100g"}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/types/volumes'</pre> <pre>curl -k -X POST -d '{"vol-name":"TGT04","vol-size":"100g"}' 'https://user:password@vxms-xbrickdrm1652/api/json/v3/types/volumes'</pre>
Terminate replication	<pre>curl -X PUT -d '{}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/terminate/c2ade4c4b38748978c392191e60b5288'</pre>
Add the new Volumes to both source and target Remote Protection Consistency Groups	<pre>curl -k -X PUT -d '{"cluster-id":"xbrickdrm1648","cg-id":"PRD-CG","vol-id":"PRD04"}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/consistency-groups/add-volume'</pre> <pre>curl -k -X PUT -d '{"cluster-id":"xbrickdrm1652","cg-id":"PRD-CG","vol-id":"TGT04"}' 'https://user:password@vxms-xbrickdrm1652/api/json/v3/commands/consistency-groups/add-volume'</pre>
Add a Volume-Pair to the Replication Session	<pre>curl -k -X POST -d '{"source-cluster-id":"xbrickdrm1648","target-cluster-id":"xbrickdrm1652","protection-session-id":"PR-CG-Session","source-vol-id":"PRD04","target-vol-id":"TGT04"}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/types/volume-pairs/'</pre>
Start/resume replication	<pre>curl -k -X PUT -d '{}' 'https://user:password@vxms-xbrickdrm1648/api/json/v3/commands/remote-protections/start/c2ade4c4b38748978c392191e60b5288'</pre>

Appendix D –RESTful API Best Practices

This section provides a quick guide on best practices when using the XtremIO RESTful API.

- Use the latest XtremIO Restful API version, if possible, and specify the version in your code (see [RESTful API Versioning](#) on page 10).

For example:

```
GET /api/json/v3/types/volumes
```

- Use the "full=1" option to present all properties for all existing objects (see [Output List Definition](#) on page 29).

For example:

```
GET /api/json/v3/types/volumes?full=1
```

- Use the "prop" option to present only the relevant properties (see [Output List Definition](#) on page 29).

For example:

```
GET /api/json/v3/types/volumes?full=1&prop=index&prop=naa-name
```

- Use filtering to present only the required objects and their properties (see [Filtering Logics](#) on page 30).

For example:

```
GET /api/json/v3/types/volumes?filter=vol-size:eq:10240
```

- Use the "full=1" option in combination with the "prop" option and filtering to present a specific property for specific object.

For example (using an object GUID identifier):

```
GET  
/api/json/v3/types/volumes?full=1&filter=guid:eq:054c391b714b47bd8e8  
bfc19715d4a94&prop=creation-time
```

- Use a GUID as a unique object identifier (see [Object GUID Identifiers](#) on page 18).

For example, as input, specify the GUID:

Appendix D –RESTful API Best Practices

GET /api/json/v3/types/volumes/**3cd726fa7eaa4e9b97ad724c40e24837**

PUT /api/json/v3/commands/consistency-groups/create-repurpose-copy
{
 "from-consistency-group-id":["6770e67f9b0d4f58ab66beb7960d9075"],
 "newconsistency-group-name":"TW-NEW-CG-01"
}

For example, as output (this is the default for XtremIO REST API Version 3),
use “guid” property:

GET /api/json/v3/types/volumes?full=1&**prop=guid**

"guid": "054c391b714b47bd8e8bfc19715d4a94"

Troubleshooting and Getting Help

Dell EMC support, product, and licensing information can be obtained as follows:

Product information

For documentation, release notes, software updates or information about Dell EMC products, licensing and service; go to Dell EMC Online Support (registration required) at: <http://support.emc.com>.

Troubleshooting

Go to Dell EMC Online Support. After logging in, locate the appropriate Support by Product page.

Technical support

For technical support and service requests, go to Dell EMC Online Support. After logging in, locate the appropriate Support by Product page and choose either Live Chat or Create a service request. To open a service request through Dell EMC Online Support, you must have a valid support agreement. Contact your Dell EMC Sales Representative for details about obtaining a valid support agreement or to answer any questions about your account.

Troubleshooting and Getting Help

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