

HP Virtual Connect Manager Command Line Interface for c-Class BladeSystem Version 4.30/4.31 User Guide

Abstract

This document contains user information for the HP Virtual Connect Manager CLI. This document is for the person who installs, administers, and troubleshoots servers and storage systems. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.



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Introduction

What's new

The following changes have been implemented for VC 4.30/4.31:

- Features:
 - Support for FIPS 140-2
For information on a current certification status, see the HP website (<http://government.hp.com/Certifications.aspx>).
 - SNMPv3
 - Configure partially stacked domains
 - Monitor uplink and stacking link ports for pause flood conditions
 - Increased VLAN capacity
 - UEFI support
- Added a new `snmp-user` (on page 122) managed element.
- Enhanced the following SNMP commands to support SNMPv3:
 - `snmp` (on page 116)
 - `snmp-trap` (on page 118)
- Enhanced the `set stackinglink` ("[stackinglink](#)" on page 130) command to allow configuration of partially stacked domains.
- Enhanced the `VlanCapacity` property of the `enet-vlan` command to support more VLANs:
`enet-vlan` (on page 37)
- Enhanced the following commands to display the domain stacking mode or provide warning or notice when configuring ports that are controlled by the domain stacking mode:
 - `show stackinglink` ("[stackinglink](#)" on page 130)
 - `show config` ("[config](#)" on page 24)
 - `add uplinkport` ("[uplinkport](#)" on page 139)
 - `add port-monitor` ("[port-monitor](#)" on page 85)
 - `add sflow-ports` ("[sflow-ports](#)" on page 112)
- Enhanced the `show uplinkport` ("[uplinkport](#)" on page 139) command to display ports controlled by the domain stacking mode as disabled.
- Enhanced the `bootMode` property of the `profile` element to support UEFI:
`add profile` ("[profile](#)" on page 88)
- Added a `pxeBootOrder` property to the `enet-connection` element to allow configuration of the PXE IP boot order:
`enet-connection` (on page 33)

- Enhanced the following commands to display the configured boot mode or boot order:
 - show profile ("[profile](#)" on page 88)
 - show server ("[server](#)" on page 106)
 - show enet-connection ("[enet-connection](#)" on page 33)

Changes from VC 4.20 to VC 4.30/4.31

| Command | Changes | Virtual Connect 4.20 | Virtual Connect 4.30/4.31 |
|--|--|--|---|
| add snmp-user set snmp-user show snmp-user remove snmp-user help snmp-user | The new managed elements configure SNMP users. | Not supported | Supported |
| set stackinglink | The element configures the stacking link mode for the domain. | Not supported | Supported |
| add snmp set snmp | The element properties are enhanced to support SNMPv3. | SNMPv3 not supported | Added the following properties: [EnableV1V2=<true false>] [EnableV3=<true false>] |
| set snmp-trap add snmp-trap | The element properties are enhanced to support SNMPv3. | SNMPv3 not supported | Added the following properties: [Port=<1-65535>] [Format=<SNMPv1 SNMPv2 SNMPv3>] [UserName=<SNMPv3 username>] [EngineId=<EngineId>] [SecurityLevel=<NOAUTHNOPRIV AUTHNOPRIV AUTHPRIV>] [Inform=<true false>] |
| enet-vlan | The element property VlanCapacity is enhanced to support 8192 VLANs in the domain and 4094 networks per SUS. | "Expanded" mode allows up to 1000 VLANs per domain and 162 VLANs per physical server port. | "Expanded" mode allows up to 8192 VLANs per domain and 162 VLANs per physical server port. |
| show stackinglink show config | The commands are enhanced to display the status or configuration of domain stacking links. | Stacking mode is not displayed. | Stacking mode is Full, Horizontal, or Primary-Slice. |
| add uplinkport add port monitor add sflow-ports | The commands are enhanced to provide warning or notice when configuring ports that are controlled by the domain stacking link. | Warning or notice is not provided. | Warning or notice is provided. |

| Command | Changes | Virtual Connect 4.20 | Virtual Connect 4.30/4.31 |
|--|---|----------------------|---|
| <code>show uplinkport</code> | The command is enhanced to display port status as disabled when the port is controlled by the domain stacking link. | Not available | Port status is displayed as disabled if controlled by the domain stacking link. |
| <code>add profile</code> <code>set profile</code> | The commands are enhanced to configure the boot mode of the server profile. | Not available | Added the following property: [bootMode=<Auto Legacy UEFI>] |
| <code>add enet-connection</code> <code>set enet-connection</code> | The commands are enhanced to configure the PXE IP boot order of the Ethernet connection. | Not available | Added the following property: [pxeBootOrder=<Auto IPv4Only IPv6Only IPv4ThenIPv6 IPv6ThenIPv4>] |
| <code>show profile</code> <code>show server</code> <code>show enet-connection</code> | The commands are enhanced to display the boot mode or boot order. | Not available | The <code>show profile</code> command displays the configured boot order for the server profile. The <code>show server</code> command displays the server boot mode and UEFI capability. The <code>show enet-connection</code> command displays the configured PXE IP boot order. |

Unassigning multiple profiles

The `unassign profile` command includes the ability to unassign multiple profiles from device bays with a single command.

The following example illustrates four server profiles being unassigned from device bays with a single CLI command. If an operation fails on one of the device bays, an error message appears for that server or device bay, but the remaining operations continue.

```
->unassign profile *
SUCCESS: Profile1 unassigned from device bay enc0:1
SUCCESS: MyProfile2 unassigned from device bay enc0:2
SUCCESS: GreenProfile unassigned from device bay enc0:3
SUCCESS: RedProfile unassigned from device bay enc0:4
```

Supporting comments and blank lines in CLI scripts

The CLI supports command scripts that contain blank lines and comments. Support for comments and blank lines enables you to maintain descriptive notes within the configuration script.

The following sample script illustrates a CLI script that contains this type of formatting. All comment lines must begin with "#".


```

#-----
# This is my sample Virtual Connect Domain Configuration Script
# Revision 1.0.1.2
# February 15, 2014
#-----

#Report errors but continue processing script commands
set cli ExitOnFailure=False

# Add Users
add user SomeNetworkUser password=pass1 role=network
add user SomeStorageUser password=pass2 role=storage
add user SomeDomainUser password=pass6 role=domain
add user SomeAdminUser password=pass3 role=*
add user DomainNetworkUser password=764dhh role=domain,network

# Add Profiles with Default VC-Enet and VC-FC Connections
add profile MyProfile
add profile AnotherProfile
add profile Profile45

# Add VC-Enet Networks
add network MyNetwork
add network Network2

# Add uplink ports to the networks
add uplinkport enc0:1:1 network=MyNetwork
add uplinkport enc0:1:2 network=Network2

# Create a Shared Uplink Port Set
add uplinkset SharedSet1

# Add a new FCoE SAN fabric connection to a profile
add fcoe-connection MyNewProfile Fabric=SAN_5

# Reset the active QoS configuration type to the factory default settings but
does not change the saved configuration types
reset qos -active

```

```
# Set the domain default LACP timer to the short setting (one second)
set lacp-timer default=Short

# Add a Multicast Filter "filter1" to Filterset "mfs1"
add mfs-filter FilterSet=mfs1 McastFilter =filter1

# Set the global option to enable the loop protection and pause flood protection
set port-protect networkLoop=Enabled PauseFlood=Enabled

# Set idle user sessions to expire after 20 minutes of inactivity
set session Timeout=20

# Create a new Multicast Filter and adds it to the domain
add mcast-filter MyMcastFilter

# Assign a profile to a device bay
assign profile MyProfile enc0:1

# Done!!!
```

Virtual Connect overview

HP Virtual Connect is a set of interconnect modules and embedded software for HP BladeSystem c-Class enclosures. VC implements server edge virtualization between the server and the data center infrastructure so networks can communicate with individual servers or pools of HP BladeSystem server blades. Upgrade, replace, or move server blades within the enclosures without visible changes to the external LAN and SAN environments. The external networks connect to a shared resource server pool rather than to individual servers. VC cleanly separates server enclosure administration from LAN and SAN administration. VC simplifies the setup and administration of server connections and includes the following components:

- HP Virtual Connect Manager
- VC-Enet modules:
 - HP VC Flex-10 10Gb Ethernet Module for BladeSystem c-Class
 - HP VC FlexFabric 10Gb/24-port Module for BladeSystem c-Class
 - HP VC FlexFabric-20/40 F8 Module for BladeSystem c-Class
 - HP VC Flex-10/10D Module for BladeSystem c-Class

NOTE: Using a Flex-10 capable NIC with an HP VC Flex-10 or FlexFabric module provides the ability to divide a 10Gb NIC into four FlexNICs with configurable bandwidth.

- VC-FC modules:

- HP VC 4Gb Fibre Channel Module for BladeSystem c-Class (enhanced NPIV)
- HP VC 8Gb 24-Port Fibre Channel Module for BladeSystem c-Class
- HP VC 8Gb 20-Port Fibre Channel Module for BladeSystem c-Class

NOTE: Beginning with VC 4.10, the HP 4GB Virtual Connect Fibre Channel Module is no longer supported.

VC modules support HP BladeSystem Enclosures and all server blades and networks contained within the enclosure:

- VC-Enet modules enable connectivity to data center Ethernet switches. VC-Enet modules can also be directly connected to other types of devices, such as printers, laptops, rack servers, and network storage devices.
- VC-FC and FlexFabric modules enable connectivity of the enclosure to data center FC switches. Every FC fabric is limited in the number of switches it can support, but the VC-FC and FlexFabric modules do not appear as switches to the FC fabric and do not count against FC fabric limits.

For information on module support of enclosures and configurations, see the product QuickSpecs on the HP website (<http://www.hp.com/go/qs>).

VCM is embedded on VC-Enet modules and is accessed through a web-based GUI or CLI. These interfaces are also accessible from Onboard Administrator.

A basic VC domain includes a single HP c-Class BladeSystem c7000 Enclosure for a total of 16 servers (or up to 32 servers if the double-dense option is enabled), or a single HP c-Class BladeSystem c3000 Enclosure for a total of 8 servers (or up to 16 servers if the double-dense option is enabled). For more information on the double-dense option, see "Double-dense server bay option." Within the domain, any server blade with the requisite LAN or SAN devices can access any LAN or SAN connected to a VC module, and a server blade of a given processor type (Integrity or X86) can be used as a spare for any server blade of the same processor type within the same enclosure, as long as the server has the requisite number and type of connections. Using the network access groups feature, the network administrator can clearly define a separation of networks based on their allowed functionality and prevent the server administrator from assigning specific network combinations in the same server profile.

By stacking (cabling) the VC-Enet modules together within the domain and connecting the VC-FC or FlexFabric module FC uplinks on the same bay of all enclosures to the same FC switch, every server blade in the domain can be configured to access any external network or fabric connection. With this configuration, you can use VCM to deploy and migrate a server blade profile to any server in the Virtual Connect domain without changing external LAN or SAN configurations.

Beginning with VC 4.10, the FTP service on VC-Enet modules is disabled by default. The VCSU software temporarily enables and disables the FTP service during firmware upgrades of VC-FC modules as needed. More recent versions of VC use SFTP instead of FTP for firmware upgrades.

Each version of VC is tested and supported with one or more SPPs. For a list of supported SPPs that must be installed, see the VC release notes.

Using multiple enclosures

Observe the following information:

- A single domain supports up to four c7000 enclosures.
c3000 enclosures are not supported in multiple enclosure domains.

- If double-dense mode is enabled in the Domain Setup Wizard, each enclosure can support a total of 128 servers.
- Stacking cables are used to connect multiple enclosures. This allows all VC-Enet modules to be interconnected and redundantly stacked.
- When the domain stacking mode is configured, stacking cables connect the primary slice of each enclosure. The primary slice is the primary and standby interconnect modules for the enclosure.
- All enclosures must have the same FC, FlexFabric, or Flex-10/10D module configuration.
For example, if bays 1 and 2 of the Primary Enclosure contain FlexFabric-20/40 F8 modules, then bays 1 and 2 of Remote Enclosures 1, 2, and 3 must also contain FlexFabric-20/40 F8 modules.
- A total of 16 Ethernet and 16 VC-FC type modules can be installed in a multi-enclosure domain.
Each FlexFabric module counts as one Ethernet and one VC-FC module. Combinations of FlexFabric, VC-Enet and VC-FC modules are allowed as long as the 16-module limit for each module type (Ethernet and FC) is not exceeded in the domain.
- VC-FC or FlexFabric modules must be in the same bay of all enclosures and connected to the same FC switch to enable profile mobility.
- All FC-capable modules in the same horizontally adjacent bay pair (bays 1-2, 3-4, and so on) must be of the same type and position in all enclosures.
- Multi-enclosure double-dense domains require similar and compatible VC-FC modules in bays 5, 6, 7, and 8 in all enclosures when FC connectivity is required. If a multi-enclosure double-dense configuration contains incompatible VC-FC modules in bays 5, 6, 7, or 8 in any of the enclosures, some or all of the compatible VC-FC modules in the remote enclosures might be designated INCOMPATIBLE after import.
- Be sure all Onboard Administrator and VC module management interfaces within the same VC domain are on the same lightly loaded subnet and highly reliable network.
If the management network is overloaded, configuration attempts may be disabled until the connectivity is re-established and synchronized with the domain.
- HP recommends using a static IP address for Onboard Administrator.
- Be sure all Onboard Administrators use the same user credentials. VCSU uses the primary credentials for the remote enclosures to propagate firmware updates to all VC modules in each enclosure.
- When both Primary and Standby modules in the base enclosure are taken down for maintenance or lose power and are no longer present in the domain, the management capabilities in the VC domain are lost. Both the Primary and Standby modules in the base enclosure must be recovered to regain management access to the VC domain.
If network and fabric uplinks are defined on the remaining enclosures, the servers continue to have network and storage access.

CLI command execution modes

The Virtual Connect Manager CLI provides two different methods for executing commands: interactive shell mode and script mode. Script mode is the same as non-interactive mode.

Interactive Shell Mode

This mode is used to invoke CLI command operations with the dedicated management shell. The shell is provided after you log in with valid credentials, and only accepts known VCM CLI commands as input.

Press the Tab key to auto complete subcommands and managed-elements. You can also type characters and then press the Tab key to see a narrowed-down list of command options.

You can quit the shell by using the `exit` command. See the example of logging in to the interactive management shell below. In the example, the primary VCM is located at IP address 192.168.0.120.

```
>ssh 192.168.0.120
```

```
login as: michael
password: *****
```

```
-----
HP Virtual Connect Management CLI v4.31
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All Rights Reserved
-----
```

GETTING STARTED:

```
help          : displays a list of available subcommands
exit          : quits the command shell
<subcommand> ? : displays a list of managed elements for a subcommand
<subcommand> <managed element> ? : displays detailed help for a command
```

->

Script Mode

In some cases, you might want to write automated scripts that execute a single command at a time. These scripts can be used to batch several commands in a single script file from the SSH client. See the example of how to use the script mode for CLI command execution below. In the example, the primary VCM is located at IP address 192.168.0.120.

```
->ssh Administrator@192.160.0.120 show enclosure
<command output displayed to user's screen>
```



IMPORTANT: To suppress prompting for a password during login, you must first setup the SSH encryption keys using the VCM Web GUI, and configure your SSH client properly with the keys. For more information on configuring the SSH keys, see the *HP Virtual Connect for c-Class BladeSystem User Guide* on the HP website (<http://www.hp.com/go/vc/manuals>).

Remote access to the Virtual Connect Manager

To access the VCM CLI remotely through any SSH session:

1. Using any SSH client application, start an SSH session to the Virtual Connect Manager.
2. When prompted, enter the assigned IP address or DNS name of the Virtual Connect Manager.
3. Enter a valid user name.
4. Enter a valid password. The CLI command prompt appears.
5. Enter commands for the Virtual Connect Manager.
6. To terminate the remote access SSH session, close the communication software or enter `exit` at the CLI command prompt.

To access the VCM CLI remotely through the Onboard Administrator CLI, run the `connect interconnect` command from the Onboard Administrator CLI.

Command output filtering

The CLI provides output filtering capabilities that enable you to display only properties of interest. This feature is useful for filtering large amounts of output data for specific information. One or more properties can be specified in the output filtering rules.

The following examples illustrate some common usage scenarios for output filtering:

Example 1: Displaying all enabled users

```
->show user enabled=true
```

Example 2: Displaying all VC Ethernet modules

```
->show interconnect type=VC-ENET
```

Example 3: Displaying all external uplinks that have a link established

```
->show uplinkport status=linked
```

Example 4: Displaying all uplink ports with connector type of RJ-45 and speed configured to Auto

```
->show uplinkport type=RJ45 Speed=Auto
```

Example 5: Displaying all servers currently powered on

```
->show server power=On
```

Command line overview

The VCM Command Line Interface can be used as an alternative method for administering the VCM. Using the CLI can be useful in the following scenarios:

- You can develop tools that utilize VCM functions for data collection and for executing provisioning and configuration tasks.
- When no browser is available or you prefer to use a command line interface, you can access management data and perform configuration tasks.
- You can batch commands using script files. These script files can be run manually or scheduled to run automatically.

Virtual Connect FIPS mode of operation

Beginning with version 4.30, Virtual Connect supports FIPS 140-2 Level 1 security requirements. Enabling FIPS mode requires the use of secure protocols, standards, and procedures within the VC domain. The Virtual Connect FIPS certification is currently based on the standards described in *Federal Information Processing Standards Publication 140-2* (<http://csrc.nist.gov/publications/PubsFIPS.html>).

The term FIPS mode is used throughout this document to describe the feature, not the validation status. For information about current FIPS status of this or any other firmware version, see the following documents:

- *Cryptographic Module Validation Program FIPS 140-1 and FIPS 140-2 Modules In Process List* (<http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/140InProcess.pdf>)
- *FIPS 140-1 and FIPS 140-2 Vendor List* (<http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401vend.htm>)

For more information about Virtual Connect FIPS mode of operation, see the latest *HP Virtual Connect for c-Class BladeSystem User Guide* in the Virtual Connect Information Library (<http://www.hp.com/go/vc/manuals>).

The VCM CLI prompt indicates if the domain is in FIPS mode by displaying the following prompt:

FIPS->

The following features are disabled or restricted when the domain is in FIPS mode:

- FTP and TFTP
- TACACS+ authentication
- RADIUS authentication
- Automated deployment
- Configurable user roles
- Administrator password recovery
- USB firmware updates
- SNMPv1 and SNMPv2
- MD5 authentication and DES encryption for SNMPv3
- Remote logging, except when using stunnel for encryption
- Short passwords
- Weak passwords

By default, the password strength is set to strong and the minimum password length must be 8 or more characters. VCM uses SCP and SFTP protocols instead of FTP and TFTP.

SFTP must be used when the domain is in FIPS mode. Use SFTP when transferring data with the following commands:

- `save configbackup`
- `restore configbackup`
- `load ldap-certificate`
- `load profile`
- `save profile`
- `load ssh`
- `load ssl-certificate`
- `save ssl-csr`
- `save supportinfo`

Command line syntax

CLI input is case-insensitive, except when otherwise noted. The general CLI syntax format is as follows:

`<subcommand> <managed element> <parameters> [<options>] [<properties>]`

| Item | Description |
|-----------------|--|
| subcommand | Operation performed on a managed element |
| managed element | Target management entity |
| parameters | Command extensions for a particular management operation |

When using a Linux SSH client, simply redirect the script into SSH. If the SSH keys are not configured on the client and in the firmware, a password prompt appears. To enable script automation and better security, SSH public/private key-pairs can be generated and uploaded to the public key to the VC firmware. For example:

```
>ssh Admin@192.168.0.120 < myscript.txt
```

When using a Windows-based SSH client, pass the file to the client using the `-m` option. If the SSH keys are not configured on the client and in the firmware, a password prompt appears. To allow script automation and better security, SSH public/private key-pairs can be generated and uploaded to the public key to the VC firmware. For example:

```
>plink Admin@192.168.0.120 -m myscript.txt
```

The CLI enables you to enter multiple CLI commands in a single command-line invocation. This capability is useful when batching several commands together and executing them in a particular sequence, within the context of the same SSH session. This method improves the overall performance of lengthy script processing.

Example 1: Sample commands with no command batching

```
add profile Profile1
add network Network1
add uplinkset UplinkSet1
```

Example 2: Sample commands using command batching

```
add profile Profile1;add network Network1;add uplinkset UplinkSet1
```

Command line

Subcommands

| Command | Description |
|----------|--|
| add | Add a new object to the domain or to another object |
| assign | Assign a server profile to a device bay |
| copy | Copy a configuration from one server profile to another server profile |
| delete | Delete the domain configuration |
| exit | Exit the Virtual Connect Manager command-line shell |
| help | Display context-sensitive help for a command or object |
| import | Import an enclosure into the domain |
| load | Transfer a file from a remote location to the domain |
| poweroff | Power off one or more servers |
| poweron | Power on one or more servers |
| reboot | Reboot one or more servers |
| remove | Remove or delete an existing object (for example, users or profiles) |
| reset | Perform a reset operation on an object (for example, vcm) |
| restore | Restore a file from a remote location |
| save | Transfer a file from the domain to a remote location |
| set | Modify one or more configuration properties of an object |
| show | Display properties or information about an object |
| test | Test the configuration of an object (for example, log-target) |
| unassign | Unassign a server profile from a device bay |

Managed elements

| Managed element | Description |
|------------------------------|--|
| all (on page 21) | Display all VC domain-managed elements |
| activity (on page 21) | Display activity events performed by VCM and the step-wise progress of those events |
| auto-deployment (on page 21) | Manage VC domain configurations from a centralized location |
| banner (on page 23) | Manage the login screen banner configuration |
| cli (on page 24) | Modify command execution behavior in script mode and auto-deployment |
| config (on page 24) | Display all commands for all objects defined in the domain |
| configbackup (on page 25) | Manage configuration backup and restore operations |
| connection-map (on page 27) | Display server-to-target connectivity information for servers with assigned profiles containing DirectAttach fabrics |
| devicebay (on page 28) | Display enclosure device bay information |

| Managed element | Description |
|-------------------------------------|---|
| domain (on page 28) | Manage general VC domain settings and information |
| enclosure (on page 31) | Manage general enclosure settings and information |
| enet-connection (on page 33) | Manage Ethernet network connections |
| enet-vlan (on page 37) | Manage Ethernet VLAN settings configuration |
| external-manager (on page 38) | Manage external manager settings and information |
| fabric (on page 40) | Manage Fibre Channel SAN fabrics |
| fc-connection (on page 43) | Manage Fibre Channel SAN fabric connections |
| fcoe-connection (on page 46) | Manage FCoE SAN fabric connections |
| firmware (on page 50) | Manage interconnect module firmware |
| igmp (on page 51) | Manage Ethernet IGMP Snooping settings |
| igmp-group (on page 50) | Display interconnect module IGMP Group table information |
| interconnect (on page 52) | Manage I/O interconnect modules |
| interconnect-mac-table (on page 51) | Display interconnect module MAC table information |
| iscsi-boot-param (on page 53) | Manage iSCSI connection boot parameters |
| iscsi-connection (on page 56) | Manage iSCSI connections |
| lacp-timer (on page 59) | Manage the domain default LACP timer |
| ldap (on page 62) | Manage LDAP configuration settings |
| ldap-certificate (on page 60) | Manage LDAP certificate information |
| ldap-group (on page 61) | Manage LDAP group configuration settings |
| link-dist-interval (on page 63) | Manage the FC login re-distribution interval |
| lldp (on page 64) | Display LLDP information received on a port |
| local-users (on page 65) | Modify the local user authentication settings for the VC domain |
| log-target (on page 66) | Manage remote log destination settings |
| loop-protect (on page 68) | Manage network loop protection settings |
| mac-cache (on page 69) | Manage Ethernet MAC cache failover settings |
| mfs-filter (on page 74) | Manage Multicast Filters in Multicast Filtersets |
| mcast-filter (on page 72) | Monitor and manage multicast group membership for hosts subscribing to IGMP Multicast traffic |
| mcast-filter-rule (on page 69) | Manage new Multicast Filter rules for a Multicast Filter |
| mcast-filter-set (on page 70) | Manage Multicast Filtersets |
| nag-network (on page 74) | Manage network access group memberships |
| name-server (on page 76) | Display a snapshot of all hosts and direct attached storage devices for the specified FlexFabric module |
| network (on page 80) | Manage VC Ethernet networks |
| network-access-group (on page 76) | Manage network access groups |
| network-range (on page 77) | Manage ranges of networks |
| port-monitor (on page 85) | Manage port monitor configuration |
| profile (on page 88) | Manage VC server profiles |
| qos (on page 97) | Manage the QoS configurations |
| qos-class (on page 94) | Manage the class of the active QoS configuration |
| qos-classifier (on page 95) | Manage the traffic classifier for the active QoS configuration |
| qos-map (on page 96) | Manage the traffic classification maps of the active QoS configuration |

| Managed element | Description |
|--|--|
| radius (on page 100) | Manage RADIUS authentication settings |
| radius-group (on page 99) | Manage RADIUS group configuration settings |
| role (on page 101) | Manage user authentication order by access role (privilege) |
| server (on page 106) | Manage physical HP BladeSystem server blades |
| serverid (on page 108) | Manage virtual server ID configuration settings |
| server-port (on page 105) | Display all physical server ports |
| server-port-map (on page 104) | Manage shared server downlink port mapping configuration |
| server-port-map-range (on page 103) | Manage ranges of shared server downlink port mapping configurations |
| session (on page 109) | Manage the session timeout value |
| sflow (on page 110) | Manage the existing VC Ethernet network with sFlow |
| sflow-module (on page 110) | Manage the network interface settings created for sFlow |
| sflow-ports (on page 112) | Manage the ports to be sampled or polled for a receiver |
| sflow-receiver (on page 114) | Manage the receivers |
| snmp (on page 116) | Modify SNMP configurations |
| snmp-access (on page 117) | Manage SNMP access configurations |
| snmp-trap (on page 118) | Modify SNMP-trap configurations |
| snmp-user (on page 122) | Manage SNMP users |
| ssh (on page 125) | Manage SSH configuration and information |
| ssl (on page 129) | Manage SSL configuration and information |
| ssl-certificate (on page 126) | Manage SSL certificate information |
| ssl-csr (on page 127) | Manage an SSL certificate signing request |
| stackinglink (on page 130) | Display stacking link information and status |
| statistics (on page 131) | Display or reset statistics on a designated interconnect module port |
| statistics-throughput (on page 133) | Manage the port throughput statistics |
| status (on page 135) | Display overall VC domain status information |
| storage-management (on page 135) | Manage iSCSI storage management information |
| supportinfo (on page 137) | Generate VC support information |
| systemlog (on page 138) | Display the VCM system event log |
| tacacs (on page 138) | Manage TACACS+ authentication settings |
| uplinkport (on page 139) | Manage interconnect module uplink ports |
| uplinkset (on page 143) | Manage shared uplink port sets |
| user (on page 146, "User roles" on page 149) | Manage local VC user configurations |
| user-security (on page 145, on page 146) | Manage user security settings |
| vcm (on page 148) | Manage the VC domain manager |
| version (on page 149) | Display CLI version information |

The following sections provide detailed information for using the subcommands with each managed element.

To display command help, enter a command followed by `? or -help`. For more information on the `help` subcommand, see "Help subsystem (on page 155)."

activity

Display activity events being performed by VCM and the step-wise progress of those events.

Supported actions: help, show

| Item | Description |
|----------------|---|
| show activity | Display activity events being performed by VCM and the step-wise progress of those events. The activity event display includes the following columns: <ul style="list-style-type: none">• Time• User• Reason• Activity• Progress• Detail To close the activity display, press q. |
| Syntax | show activity |
| Example | |
| | ->show activity Displays the activity events being performed by VCM and the step-wise progress of those events |

all

Manage all Virtual Connect domain elements.

Supported actions: help, show

| Item | Description |
|-----------------|--|
| show all | Display all Virtual Connect domain configuration objects. This command is typically useful for displaying a snapshot of the entire domain configuration with a single command. |
| Syntax | show all [*] |
| Examples | |
| | ->show all Displays all configuration objects (summary view) |
| | ->show all * Displays all configuration objects (detailed view) |

auto-deployment

Configure multiple VC domain configurations from a centralized location.



IMPORTANT: Auto-deployment supports single-enclosure domains. Multi-enclosure (stacked) domains are not supported. For more information on auto-deployment, see the *HP Virtual Connect for c-Class BladeSystem User Guide* on the HP website (<http://www.hp.com/go/vc/manuals>).

Supported actions: help, set, show, start, stop

| Item | Description |
|---------------------|--|
| set auto-deployment | This command enables customization of options related to auto-deployment, such as choosing to use DHCP to discover a TFTP server location or to manually specify TFTP settings to use for the configuration script location used for deployment. |
| Syntax | set auto-deployment TftpMode=<Auto Manual> [TftpServer=<IP or DNS name> TftpFile=<file name>] |
| Examples | |
| | <pre>->set auto-deployment TftpMode=Manual TftpServer=192.168.1.1 TftpFile=myconfig.script</pre> <p>Use a specified TFTP server as the configuration script source used for deployment</p> <pre>->set auto-deployment TftpMode=Auto</pre> <p>Use DHCP for automatic discovery of the configuration script source</p> |

| Item | Description |
|----------------------|--|
| show auto-deployment | This command displays properties related to auto-deployment. This includes the current status, deployment log, the configuration script used for deployment, and the command output generated from the configuration of the domain during deployment. |
| Syntax | show auto-deployment [[status] [log] [config] [output]] |
| Examples | |
| | <pre>->show auto-deployment ->show auto-deployment status</pre> <p>Display the status of auto-deployment along with its settings</p> <pre>->show auto-deployment log</pre> <p>Display the deployment log</p> <pre>->show auto-deployment config</pre> <p>Display the configuration script used in the deployment</p> <pre>->show auto-deployment output</pre> <p>Display the output generated from executing the configuration script</p> |

| Item | Description |
|-----------------------|---|
| start auto-deployment | This command initiates the auto-deployment process. During deployment, servers are powered off, the domain is cleared, and the configuration is deployed using the configuration script downloaded from the remote TFTP server. This command might cause the current user session to log out during the deployment process. |
| Syntax | start auto-deployment |
| Examples | |
| | <pre>->start auto-deployment</pre> <p>Starts a new deployment process</p> |

| Item | Description |
|----------------------|--|
| stop auto-deployment | Stop a deployment operation that is in progress. |
| Syntax | stop auto-deployment |

| Item | Description |
|-----------------|---|
| Examples | |
| | ->stop auto-deployment Stops an in-progress deployment operation |

banner

Manage the login screen banner configuration.

Supported actions: add, help, remove, show

| Item | Description |
|-------------------|---|
| add banner | Add banner text to the login screen. You can access VCM through ssh or the OA. After banner text is added, the banner is displayed before the user credential prompt when VCM is accessed. |
| Syntax | add banner text=["<banner text>" '<banner text>'] |
| Properties | |
| text (required) | The text to display on the login in screen. Multi-line banner text can be entered through multiple add banner commands. New lines are appended to existing text. The banner text limit is 1500 bytes. If the accumulated banner text length exceeds 1500 bytes, either from one or multiple add banner commands, an error message appears. Only printable characters are allowed. |
| Examples | |
| | ->add banner text="This is a private system, unauthorized access is not allowed." Adds banner text with a single command |
| | ->add banner text="This is a private system." ->add banner text="" ->add banner text="Unauthorized access is prohibited." ->add banner text="" ->add banner text="Communications are monitored." Adds banner text with multiple commands (A blank line is displayed in between each line of text in this example.) |

| Item | Description |
|----------------|---|
| remove banner | Remove configured banner text. |
| Syntax | remove banner |
| Example | |
| | ->remove banner Removes the configured banner text |

| Item | Description |
|----------------|--|
| show banner | Display the configured banner text. |
| Syntax | show banner |
| Example | |
| | ->show banner Displays the configured banner text |

cli

This command modifies command execution behavior in script mode and auto-deployment. Script mode is the same as non-interactive mode.



IMPORTANT: The `show config` output contains the `set cli` command with the default property and value, which is commented out. To modify command execution behavior while passing a script to CLI over SSH, uncomment and change the value of the `ExitOnFailure` property. If this command is specified in an auto-deployment command script, the expected value should be 'true'. If 'false' is specified, it results in a command failure and prevents deployment execution because overriding command failures is not supported in auto-deployment.

Supported actions: `help`, `set`

| Item | Description |
|--|--|
| <code>set cli</code> | Set CLI command execution behavior. Only supported in script mode. |
| Syntax | <code>set cli ExitOnFailure=<True False></code> |
| Property | |
| <code>ExitOnFailure</code> (required) | Controls whether the VCMCLI will exit on command failure during execution of commands. This capability is only supported if passing a command script to the VCMCLI over SSH. If set to false, a failed command displays the appropriate error message. The script continues and the remaining commands are executed. Valid values include 'true' and 'false'. The default value is 'true'. |
| Examples | |
| | <pre>->set cli ExitOnFailure=False</pre> Sets the CLI to ignore command failure and continue to execute the remaining commands in the script <pre>->set cli ExitOnFailure=True</pre> Sets the CLI to exit on command failure if a command fails in a script while passing to the CLI over SSH |

config

Display all CLI commands for all objects defined in the domain. The `show config` command is useful for generating a CLI script that can be used for creating a domain configuration. The generated script is only valid for the firmware version currently running. A script generated on one version of firmware is unlikely to be properly executed by a different version of firmware.

Externally-defined MAC addresses, WWNs and serial numbers are displayed with a warning in the output and cannot be used on VCMCLI commands when recreating the domain.

Supported actions: `help`, `show`

| Item | Description |
|------------------------------|---|
| <code>show config</code> | Generate a configuration script from the running domain. |
| Syntax | <code>show config -includePoolInfo</code> |
| Option | |
| <code>includePoolInfo</code> | Include VC-defined or user-defined pool assigned SerialNumber, MAC, and WWN addresses for the domain. |
| Examples | |

| Item | Description |
|------|--|
| | <pre>->show config</pre> Displays the configuration script for the running domain <pre>->show config -includePoolInfo</pre> Displays the configuration script for the running domain, including the pool ID or user-defined range |

configbackup

Manage the domain configuration file.

Supported actions: help, restore, save



CAUTION: Do not restore a configuration backup file by using a file from another domain and including the property to ignore the enclosure serial number. Restoring a Virtual Connect domain configuration from a backup file that was created on another Virtual Connect domain is not supported and can cause serious faults within this and other Virtual Connect Domains within the environment. The restore selection and configuration files should only be used to restore the same previously existing domain.

| Item | Description |
|------------------------------|--|
| restore configbackup | Transfer a configuration file from a remote server using TFTP, FTP, or SFTP, and restore the configuration. Be sure that the domain state is IMPORTED before attempting to restore the configuration. |
| Syntax | <pre>restore configbackup [-quiet] [-maskEncryptKey] address=<tftp://ipaddress/[filename] ftp://user:password@ipaddress/[filename]> [encryptionkey=<secret password>] [ignoreenclosureid=<true false>] [ignorefwversion=<true false>]</pre> |
| Option | |
| quiet (optional) | Suppresses user confirmation prompts |
| maskEncryptKey (optional) | Specify the encryption key after entering the command. The key string is masked and confirmed. |
| Properties | |
| Address (required) | A valid IP address of a TFTP, FTP, or SFTP server with user name and password (where needed) and the name of the configuration backup file. If not specified, the default file name is "vc-config-backup". The file path specified is treated as relative to the login directory for the user on the FTP server. Be sure that the permissions are appropriate for a successful transfer. |
| EncryptionKey (optional) | A password used to decrypt the configuration backup file. When the domain is in FIPS mode, the encryption key is required. |
| IgnoreEnclosureID (optional) | Restores a configuration that was generated on another enclosure. Valid values are "true" and "false". The default value is "false". When the value is set to "false", the configuration generated on another enclosure is rejected. |
| IgnoreFWVersion (optional) | Restores a configuration that was generated on another firmware version. Valid values are "true" and "false". The default value is "false". When the value is set to "false", the configuration generated on another firmware version is rejected. |
| Examples | |
| | <pre>->restore configbackup address=tftp://192.168.10.12/new-vc-config-backup ->restore configbackup</pre> |

| Item | Description |
|-------------------|--|
| | address=tftp://[2001::50]/new-vc-config-backup Restores a configuration backup file from a remote TFTP server |
| | ->restore configbackup address=ftp://user:password@192.168.10.12/new-vc-config-backup ->restore configbackup address=ftp://user:password@[2001::50]/new-vc-config-backup Restores a configuration backup file from a remote FTP server |
| | ->restore configbackup address=ftp://user:password@192.168.10.12/new-vc-config-backup ignoreenclosureid=true ->restore configbackup address=ftp://user:password@[2001::50]/new-vc-config-backup ignoreenclosureid=true Restores a configuration backup file from a remote FTP server and ignores the serial number |
| | ->restore configbackup address=ftp://user:password@192.168.10.12/new-vc-config-backup ignorefwversion=true ->restore configbackup address=ftp://user:password@[2001::50]/new-vc-config-backup ignorefwversion=true Restores a configuration backup file from a remote FTP server and ignores the firmware version |
| | ->restore configbackup address=ftp://user:password@192.168.10.12/new-vc-config-backup encryptionkey=secret ->restore configbackup address=ftp://user:password@[2001::50]/new-vc-config-backup encryptionkey=secret Restores a configuration backup file from a remote FTP server with an encryption key |
| | ->restore configbackup -maskEncryptKey address=ftp://user:password@192.168.10.12/new-vc-config-backup ->restore configbackup -maskEncryptKey address=ftp://user:password@[2001::50]/new-vc-config-backup Restores a configuration backup file from a remote FTP server with a masked encryption key |
| | ->restore configbackup -quiet address=ftp://192.168.10.12/new-vc-config-backup ->restore configbackup -quiet address=ftp://[2001::50]/new-vc-config-backup Restores a configuration backup file without user confirmation prompts |
| | ->restore configbackup address=ftp://user:password@192.168.10.12:2000/new-vc-config-backup ->restore configbackup address=ftp://[2001::50]:2000/new-vc-config-backup Restores a configuration backup file from a remote FTP server with a user-specified port number |
| Item | Description |
| save configbackup | Generate and transfer a Virtual Connect configuration backup file to a remote server using TFTP, FTP, or SFTP. |

| Item | Description |
|------------------------------|---|
| Syntax | <pre>save configbackup [-maskEncryptKey] address=<tftp://ipaddress/[filename] ftp://user:password@ipaddress/[filename]> [encryptionkey=<secret password>]</pre> |
| Option | |
| maskEncryptKey (optional) | Enables you to interactively specify the encryption key as a masked string at the command prompt |
| Properties | |
| Address (required) | A valid IP address of a TFTP, FTP, SFTP server with user name and password (where needed) and the name of the configuration backup file. If not specified, the default file name is "vc-config-backup". The file path specified is treated as relative to the login directory for the user on the FTP server. Be sure that the permissions are appropriate for a successful transfer. |
| EncryptionKey (optional) | A password used to encrypt the configuration file. When the domain is in FIPS mode, an encryption key is required. |
| Examples | |
| | <pre>->save configbackup address=tftp://192.168.10.12/new-vc-config-backup ->save configbackup address=tftp://[2001::50]/new-vc-config-backup</pre> <p>Saves a configuration backup file to a remote TFTP server</p> |
| | <pre>->save configbackup address=ftp://user:password@192.168.10.12/new-vc-config-backup ->save configbackup address=ftp://user:password@[2001::50]/new-vc-config-backup</pre> <p>Saves a configuration backup file to a remote FTP server</p> |
| | <pre>->save configbackup address=ftp://user:password@192.168.10.12/new-vc-config-backup encryptionkey=secret ->save configbackup address=ftp://user:password@[2001::50]/new-vc-config-backup encryptionkey=secret</pre> <p>Saves a configuration backup file to a remote FTP server with an encryption key</p> |
| | <pre>->save configbackup -maskEncryptKey address=ftp://user:password@192.168.10.12/new-vc-config-backup ->save configbackup -maskEncryptKey address=ftp://user:password@[2001::50]/new-vc-config-backup</pre> <p>Saves a configuration backup file to a remote FTP server with a masked encryption key</p> |
| | <pre>->save configbackup address=ftp://user:password@192.168.10.12:2000/new-vc-config-backup ->save configbackup address=ftp://user:password@[2001::50]:2000/new-vc-config-backup</pre> <p>Save a configbackup file to a remote FTP server with a user-specified port number</p> |

connection-map

Display server-to-target connectivity information for servers with assigned profiles containing DirectAttach fabrics.

Supported actions: help, show

| Item | Description |
|------------------------|---|
| show connection-map | Display server-to-target connectivity information for servers with assigned profiles containing DirectAttach fabrics. |
| Syntax | show connection-map <ModuleID> |
| Parameter | |
| ModuleID (required) | The ID of the module for which to display the connection map information. The module must be a FlexFabric module. The ID is in the format of <EnclosureID>:<BayNumber>. |
| Example | |
| | ->show connection-map enc0:1 Displays the connection map information for the module in bay 1 of enclosure enc0 |

devicebay

Manage general enclosure device bay settings and information.

Supported actions: help, show

| Item | Description |
|---------------------------|---|
| show devicebay | Display device bays of all enclosures that exist in the Virtual Connect domain. |
| Syntax | show devicebay [<DeviceBayID> *] |
| Parameter | |
| DeviceBayID (Optional) | The reference ID of a device bay in the domain The format of the device bay ID is <EnclosureID>:DeviceBay>. Example: "enc0:1" indicates device bay 1 of the local enclosure being managed. Use "*" to display detailed information for all enclosures. If EnclosureID is not specified, the default enclosure is the local enclosure where the Virtual Connect Manager and domain exist. If a multi-blade server is present, use the DeviceBayID of the monarch bay. This is the ID value shown by show devicebay. |
| Examples | |
| | ->show devicebay Displays a summary listing of all device bays |
| | ->show devicebay * Displays detailed information for all device bays |
| | ->show devicebay enc0:2 Displays detailed information for device bay 2 of the local enclosure |
| | ->show devicebay enc1:4 Displays detailed information for device bay 4 of a remote enclosure |
| | ->show devicebay enc0:5 Displays detailed information for a multi-blade server in device bays 5-8 of the primary enclosure. |

domain

Manage general VC domain settings and information.

Supported actions: delete, help, set, show

| Item | Description |
|-----------------|--|
| delete domain | Delete the existing VC domain configuration. Deleting the domain removes the entire VC domain configuration and resets it to the original defaults. After the domain is deleted, you are logged out and the VCM resets. |
| Syntax | delete domain [-quiet] |
| Option | |
| quiet | Suppresses user confirmation prompts. This option is useful when scripting delete domain operations. |
| zeroize | This option is only valid when the domain is in FIPS mode. Erases all critical security parameters while deleting the domain. All VC-Enet modules reboot during the operation. |
| Examples | |
| | ->delete domain Deletes the VC domain configuration and prompts for user confirmation |
| | ->delete domain -quiet Deletes the VC domain quietly without prompting for user confirmation (primarily used in automated scripting scenarios) |

| Item | Description |
|---|---|
| set domain | Modify general VC domain configuration properties, such as the domain name, domain IP address, and MAC and WWN address pool settings. |
| Syntax | set domain [Name=<NewName>] [DomainIp=<Enabled Disabled>] [IpAddress=<IPAddress>] [SubnetMask=<mask>] [Gateway=<Gateway>] [DomainIpv6=<Enabled Disabled>] [Ipv6Address=<IPv6Address>/<prefix-length>] [Ipv6Gateway=<IPv6Address>] [MacType=<VC-Defined Factory-Default User-Defined>] [MacPool=<1-64>] [MacStart=<MAC address>] [MacEnd=<MAC address>] [WwnType=<VC-Defined Factory-Default User-Defined>] [WwnPool=<1-64>] [WwnStart=<WWN Address>] [WwnEnd=<WWN Address>] [SingleDense=true false] |
| Properties | |
| Name (optional) | The new name of the domain. Valid characters include alphanumeric, "_", and ".". The maximum length of the name is 31 characters. |
| DomainIP (optional) | Enables or disables the VC domain IP address. If enabled, a valid IP address and subnet mask must be configured. If disabled, DHCP is used to obtain a valid IP address. Enabling domain IP address configuration or changing the domain IP address can cause a temporary loss of connectivity to the VCM. Use caution when changing these settings. Values include "Enabled" and "Disabled". |
| IpAddress (Required if DomainIP is enabled) | A valid IP address to use for the domain IP address configuration. The IP address must be in the format xxx.xxx.xxx.xxx, where x is a number between 0 and 9, for example, 192.168.0.10. |
| SubnetMask (Required if IP address specified) | A valid subnet mask for the domain IP address configuration. The subnet mask must be in the format xxx.xxx.xxx.xxx, where x is a number between 0 and 9, for example, 255.255.255.0. |
| Gateway (Required if IP address specified) | A valid gateway address for the domain IP address configuration. The gateway address must be in the format xxx.xxx.xxx.xxx, where x is a number between 0 and 9, for example, 192.168.0.1. |
| DomainIpv6 (optional) | Enables or disables the VC domain IPv6 address. If enabled, you must configure a valid IPv6 address. |

| Item | Description |
|--|---|
| | Enabling a domain IPv6 address configuration or changing the domain IPv6 address can cause a temporary loss of connectivity to the VCM. Use caution when changing these settings. Values include "Enabled" and "Disabled." |
| Ipv6 Address (optional) | A valid IPv6 address to use for the domain IPv6 address configuration. The IPv6 address must be specified with a prefix, for example, 2001::3/64. |
| Ipv6Gateway (Required if an IPv6 address is specified) | A valid IPv6 gateway for the domain IPv6 address configuration, for example, 2001::10 |
| MacType (optional) | The type of MAC address source to use for assignment. Values include "VC-Defined", "Factory-Default", and "User-Defined". |
| MacPool (optional) | The pre-defined MAC pool to use for address assignment. Values include integers from 1 to 64. This property is valid only if the MacType is set to "VC-Defined". If not specified, the default pool ID is 1. Carefully choose the pool so there are no conflicts with other addresses in the environment. |
| MacStart (Required if MacType is User-Defined) | The starting MAC address in a custom user-defined range. This property is valid only if the MacType is set to "User-Defined". |
| MacEnd (Required if MacType is User-Defined) | The ending MAC address in a custom user-defined range. This property is valid only if the MacType is set to "User-Defined". |
| WwnType (optional) | The type of WWN address source to use for assignment. Values include "VC-Defined", "User-Defined", and "Factory-Default". |
| WwnPool (optional) | The pre-defined WWN pool to use for address assignment. Values include integers from 1 to 64. This property is valid only if the WwnType is set to "VC-Defined". If not specified, the default pool ID is 1. Carefully choose the pool so there are no conflicts with other addresses in the environment. |
| WwnStart (Required if WwnType is User-Defined) | The starting WWN address in a custom user-defined range. This property is valid only if the WwnType is set to "User-Defined". |
| WwnEnd (Required if WwnType is User-Defined) | The ending WWN address in a custom user-defined range. This property is valid only if the WwnType is set to "User-Defined". |
| SingleDense (optional) | If the imported domain supports double-dense server blades, this property enables the device bay display format to support the display for single-dense servers along with the double-dense servers. In a double-dense supported configuration, the default for this property is false, which disables the display of single-dense servers. |
| Examples | |
| | ->set domain Name=MyNewDomainName Changes the name of the VC domain |
| | ->set domain DomainIp=Enabled Enables the domain IP address |
| | ->set domain DomainIp=Enabled IpAddress=192.168.0.120 SubnetMask=255.255.255.0 Gateway=192.168.0.1 Configures and enables the domain IP address |
| | ->set domain DomainIp=Disabled Disables the domain IP address and uses DHCP instead |
| | ->set domain DomainIpv6=Enabled Ipv6Address=2001::34/64 Ipv6Gateway=2002::10 Configures and enables the domain IPv6 address |

| Item | Description |
|------|--|
| | ->set domain DomainIpv6=Disabled Disables the domain IPv6 address and uses DHCP instead |
| | ->set domain MacType=VC-Defined MacPool=10 Sets the MAC address source to VC-Defined with a pre-defined range |
| | ->set domain MacType=Factory-Default Sets the MAC address source to use factory default MAC addresses |
| | ->set domain MacType=User-Defined MacStart=00-17-A4-77-00-00 MacEnd=00-17-A4-77-00-FF Sets the MAC address source to a custom, user-defined address range |
| | ->set domain WwnType=VC-Defined WwnPool=5 Sets the WWN address source to VC-Defined with a pre-defined range |
| | ->set domain WwnType=Factory-Default Sets the WWN address source to use factory default WWN addresses |
| | ->set domain WwnType=User-Defined WwnStart=50:06:0B:00:00:C2:62:00 WwnEnd=50:06:0B:00:00:C2:62:FF Sets the WWN address source to a custom, user-defined address range |
| | ->set domain SingleDense=true Sets the display option to support single-dense servers in a double-dense supported configuration |

| Item | Description |
|------------------------|---|
| show domain | Display general VC domain information, including the VC domain name, FIPS mode, the VCM domain IP address and IPv6 settings, and MAC/WWN address settings for the domain. |
| Syntax | show domain [addressPool] |
| Parameter | |
| addressPool (Optional) | Displays all VC-defined address pool ranges available for use |
| Examples | |
| | ->show domain Displays domain information |
| | ->show domain addressPool Displays the VC-defined address pool ranges available for use |

enclosure

Manage general enclosure settings and information.

Supported actions: help, import, remove, show

| Item | Description |
|----------------------|--|
| import enclosure | Import local and remote enclosures into the VC domain. VC supports up to four c7000 enclosures in a single domain. |
| Syntax | import enclosure [<IpAddress>] [-quiet] [UserName=<username>] [Password=<password>] [DoubleDense=<True False>] For enclosures that are not imported, the password field is optional. If not specified, the system interactively prompts you for the password. |
| Parameter | |
| IpAddress (Optional) | The address or DNS name of the remote enclosure to be imported. If not specified, the local enclosure is assumed. |

| Item | Description |
|--|---|
| Option | |
| quiet | This option suppresses user confirmation prompt while importing a remote enclosure, and is typically used in automated scripting scenarios. |
| Properties | |
| UserName (Required for enclosures that are not imported) | A valid user name with access to the Onboard Administrator for the enclosure to import. The user must have full administrative rights to all enclosure elements, such as device bays, I/O bays, and OAs). |
| Password (Required) | A valid OA user password for importing the enclosure. If no password is specified, the system interactively prompts you for a password during the import operation. |
| DoubleDense (Optional) | This setting can only be specified during the import of the local enclosure, and it affects the behavior of all other enclosures imported later. If the enclosure being imported supports double-dense servers, this property enables the device bay display format to display double-dense servers. The default behavior is to display single-dense servers in the enclosure. |
| Examples | |
| | ->import enclosure UserName=Administrator Password=fgg7h*1 Imports the local enclosure into the domain |
| | ->import enclosure UserName=Administrator Password=fgg7h*1 DoubleDense=true Imports the local enclosure with a double-dense device bay display format |
| | ->import enclosure 2001::34/64 UserName=admin password=am123 Imports a remote enclosure into the domain |
| | ->import enclosure Imports the previously discovered local enclosure |
| | ->import enclosure 192.168.0.120 Imports a previously discovered remote enclosure |

| Item | Description |
|------------------------|---|
| remove enclosure | Remove a remote enclosure that has been imported into the domain. The local enclosure cannot be removed from the domain using the remove enclosure command. |
| Syntax | remove enclosure <EnclosureID *> |
| Parameter | |
| EnclosureID (required) | The enclosure ID of the remote enclosure to be removed from the domain. Use "*" to remove all remote enclosures in the domain. The enclosure IDs can be identified for a particular enclosure by using the show enclosure command. The local enclosure cannot be removed from the domain with this command. |
| Examples | |
| | ->remove enclosure encl Removes a remote enclosure |
| | ->remove enclosure * Removes all remote enclosures from the domain |

| Item | Description |
|------------------|---|
| show enclosure | Display all enclosures in the domain. |
| Syntax | show enclosure [<EnclosureID> *] |
| Parameter | |
| EnclosureID | The ID of an enclosure in the domain. If specified, only details for that enclosure |

| Item | Description |
|-----------------|---|
| (optional) | appear. |
| Examples | |
| | ->show enclosure Displays a summary of all enclosures |
| | ->show enclosure * Displays detailed information for all enclosures |
| | ->show enclosure enc0 Displays detailed information for a specific enclosure |

enet-connection

Manage Ethernet network connections.

Supported actions: add, help, remove, set, show

| Item | Description |
|---------------------------|---|
| add enet-connection | Add a new Ethernet network connection to an existing server profile. The maximum number of Ethernet connections that can be added to a server profile is 128. |
| Syntax | <pre>add enet-connection <ProfileName> [Network=<NetworkName>] [McastFilter=<McastFilterName>] [McastFilterSet=<McastFilterSetName>] [PXE=<enabled disabled UseBios>] [pxeBootOrder=<Auto IPv4Only IPv6Only IPv4ThenIPv6 IPv6ThenIPv4>] [AddressType=<Factory-Default User-Defined Pool-Specified>] [EthernetMAC=<MAC Address> iScsiMAC=<MAC Address>] [SpeedType=<Auto Preferred Custom Disabled>] [Speed=<speed>]</pre> |
| Parameter | |
| ProfileName (required) | The name of an existing profile to which the new connection is added |
| Properties | |
| Network (optional) | The name of an existing network to associate with the connection. If the network name is not specified, or is set to "unassigned", the network remains unassigned and can be assigned later. |
| PXE (optional) | Enables or disables PXE on the network connection. Valid values are "enabled", "disabled", and "UseBios". If not specified, the default is "UseBios". Only one connection can have PXE enabled per profile. |
| pxeBootOrder (optional) | Modifies the PXE IP boot order. The default setting is 'Auto'. Valid values are: <ul style="list-style-type: none"> • Auto • IPv4Only • IPv6Only • IPv4ThenIPv6 • IPv6ThenIPv4 |
| McastFilter (optional) | The name of an existing Multicast Filter to associate with the connection if the Multicast Filter name has not been specified. If the name is not specified, or is set to "None", then the Multicast Filter is left unassigned and can be assigned later. |
| McastFilterSet (optional) | The name of an existing Multicast Filter Set to associate with the |

| Item | Description |
|---|---|
| | connection if the Multicast Filterset name has not been specified. If the name is not specified, or is set to "None", then the Multicast Filter Set is left unassigned and can be assigned later. |
| AddressType (optional) | The source of MAC address assignments to be used during the creation of the new connection. If not specified, the default is the domain default. If "User-Defined" or "Pool-Specified" is specified, both an Ethernet MAC Address and iSCSI MAC Address must also be specified. Valid values include "Factory-Default", "User-Defined" and "Pool-Specified". To use the "Pool-Specified" option, the domain MAC pool must be defined as VC-defined or user-defined and the listed addresses must be available in the current pool. |
| EthernetMAC (required if AddressType is User-Defined or Pool-Specified) | The user-defined Ethernet MAC address to use for the connection. This property is required if the AddressType specified is "User-Defined" or "Pool-Specified". |
| iScsiMAC (required if AddressType is User-Defined or Pool-Specified) | The user-defined iSCSI MAC address to use for the connection. This property is required if the AddressType specified is "User-Defined" or "Pool-Specified". |
| SpeedType (optional) | The requested operational speed for the server port. Valid values include "Auto", "Preferred", "Custom", and "Disabled". The default value is "Preferred". If the speed type is "Auto", the maximum port speed is determined by the maximum configured speed for the network. If the speed type is "Preferred", the speed of the network is the same as the preferred speed of the network to which the connection is associated. If no preferred speed is configured for a network, it defaults to "Auto". If the speed type is "Custom", you can configure a speed from 100Mb to MAX configured speed for the network in 100Mb increments. If the speed type is "Disabled", bandwidth is not allocated and the server port status is "Administratively Disabled". |
| Speed (required if the SpeedType is Custom) | The user-defined speed for the server port. Valid values include 100Mb to MAX configured speed for the network in 100Mb increments. |
| Examples | |
| | ->add enet-connection MyNewProfile Network=SomeNetwork Adds a new Ethernet network connection to a profile |
| | ->add enet-connection MyNewProfile Network=SomeNetwork2 PXE=enabled Adds a new Ethernet network connection and enables PXE |
| | ->add enet-connection MyNewProfile Adds a new Ethernet network connection and leaves the network unassigned |
| | ->add enet-connection MyNewProfile AddressType=Factory-Default Adds a new Ethernet network connection and uses factory default addresses |
| | ->add enet-connection MyNewProfile AddressType=User-Defined EthernetMAC=00-17-A4-77-00-00 iScsiMAC=00-17-A4-77-00-01 Adds a new Ethernet network connection and provides user-defined MAC addresses |
| | ->add enet-connection MyNewProfile AddressType=Pool-Specified EthernetMAC=00-17-A4-77-00-00 |

| Item | Description |
|------|---|
| | iScsiMAC=00-17-A4-77-00-01 Adds a new Ethernet network connection and specifies an address from the VC-defined or user-defined pool |
| | ->add enet-connection MyProfile Network=MyNetwork SpeedType=Preferred Adds a new Ethernet network connection and sets the speed to "Preferred" |
| | ->add enet-connection MyProfile Network=MyNetwork SpeedType=Custom Speed=2000 Adds a new Ethernet network connection and sets the speed to 2Gb |
| | ->add enet-connection MyProfile Network=MyNetwork McastFilter=MyFilter Adds a new Ethernet network connection with an associated McastFilter |
| | ->add enet-connection MyProfile Network=MyNetwork McastFilterSet=MyFilterSet Adds a new Ethernet network connection with an associated McastFilter Set |
| | ->add enet-connection MyProfile Network=MyNetwork PXE=enabled pxeBootOrder=IPv4Only Adds a new Ethernet network connection |

| Item | Description |
|------------------------|---|
| remove enet-connection | Remove the last created Ethernet network connection from an existing server profile. |
| Syntax | remove enet-connection <ProfileName> |
| Parameter | |
| ProfileName (required) | The name of the profile from which the Ethernet connection is removed |
| Example | |
| | ->remove enet-connection MyProfile Removes the last created Ethernet network connection from a profile |

| Item | Description |
|---------------------------|---|
| set enet-connection | Modify an Ethernet connection of a server profile. |
| Syntax | set enet-connection <ProfileName> <Port> [Network=<NetworkName>] [McastFilter=<McastFilterName>] [McastFilterSet=<McastFilterSetName> [PXE=<enabled disabled UseBios>] [pxeBootOrder=<Auto IPv4Only IPv6Only IPv4ThenIPv6 IPv6ThenIPv4>] [SpeedType=<Auto Preferred Custom Disabled>] [Speed=<speed>] |
| Parameters | |
| ProfileName (required) | The name of the server profile that contains the connection to modify |
| Port (required) | The port number of the connection being modified |
| Properties | |
| Network (optional) | The name of the Ethernet network to associate with the connection. This applies to Ethernet network connections only. A blank string makes the Ethernet connection unassigned. |
| McastFilter (optional) | The name of the Multicast Filter to associate with the connection if the Multicast Filter name has not been specified. |
| McastFilterSet (optional) | The name of the Multicast Filterset to associate with the connection if the Multicast Filterset name has not been specified. |

| Item | Description |
|---|---|
| PXE (optional) | Enables or disables PXE on a connection. Valid values are "enabled", "disabled", and "UseBios". This applies to Ethernet network connections only. PXE can be enabled on one connection per profile. |
| pxeBootOrder (optional) | Modifies the PXE IP boot order. The default setting is 'Auto'. Valid values are: <ul style="list-style-type: none"> • Auto • IPv4Only • IPv6Only • IPv4ThenIPv6 • IPv6ThenIPv4 |
| SpeedType (optional) | The requested operational speed for the server port. Valid values include "Auto", "Preferred", "Custom", and "Disabled". The default value is "Preferred". If the speed type is "Auto", the maximum port speed is determined by the maximum configured speed for the network. If the speed type is "Preferred", the speed of the network is the same as the preferred speed of the network to which the connection is associated. If no preferred speed is configured for a network, it defaults to "Auto". If the speed type is "Custom", you can configure a speed from 100Mb to MAX configured speed for the network in 100Mb increments. If the speed type is "Disabled", bandwidth is not allocated and the server port status is "Administratively Disabled". |
| Speed (required if the SpeedType is Custom) | The user-defined speed for the server port. Valid values include 100Mb to MAX configured speed for the network in 100Mb increments. |
| Examples | |
| | ->set enet-connection MyProfile 2 Network=NewNetworkName Changes the associated network of an Ethernet connection |
| | ->set enet-connection RedProfile 1 Network="" Sets a network connection to "Unassigned" |
| | ->set enet-connection GreenProfile 3 PXE=disabled Disables PXE on an Ethernet connection |
| | ->set enet-connection MyProfile 1 SpeedType=Preferred Modifies the Ethernet network connection to set the speed to "Preferred" |
| | ->set enet-connection MyProfile 1 SpeedType=Custom Speed=2000 Modifies the Ethernet network connection to set the speed to 2Gb |
| | ->set enet-connection RedProfile 1 McastFilter="MyFilter" Sets a Multicast Filter |

| Item | Description |
|-------------------------|--|
| show enet-connection | Display the Ethernet connections associated with the server profiles. |
| Syntax | show enet-connection [<ConnectionID>] |
| Parameter | |
| ConnectionID (optional) | The ID of an existing Ethernet connection. The ID format is <ProfileName:Port>. Use <ProfileName:*> to display all profile Ethernet connections. Use "*" to display all connections in the domain. |
| Examples | |

| Item | Description |
|------|--|
| | ->show enet-connection * Displays all Ethernet connections in the domain |
| | ->show enet-connection Profile1:* Displays all Ethernet connections of a profile named Profile1 |
| | ->show enet-connection Profile1:1 Displays a specific Ethernet connection of a profile named Profile1 |

enet-vlan

Manage Ethernet VLAN configuration settings.

Supported actions: help, set, show

| Item | Description |
|---|---|
| set enet-vlan | Modify general Ethernet VLAN configuration settings. |
| Syntax | set enet-vlan [-quiet][SharedServerVlanId=<true false>] [PrefSpeedType=<Auto Custom>] [PrefSpeed=<speed>] [MaxSpeedType=<Unrestricted Custom>] [MaxSpeed=<speed>] [VlanCapacity=<Legacy Expanded>] |
| Option | |
| quiet | This option suppresses the user confirmation prompt and is typically used in automated scripting scenarios. |
| Properties | |
| SharedServerVlanId (optional) | Enables or disables the option to force server ports connected to multiple VC Ethernet networks to use the same VLAN mappings as those used by corresponding shared uplink sets. Valid values are "true" and "false". Setting the value to "true" restricts the server network connections to be selected from a single shared uplink, and the VLAN ID cannot be modified. Setting the value to "false" enables you to select any VC Ethernet network for the server Ethernet connections, and VLAN ID mappings can be modified to ensure uniqueness. |
| PrefSpeedType (optional) | The default connection speed for any Ethernet connection using multiple networks. Valid values are "Auto" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Auto". |
| PrefSpeed (required if PrefSpeedType is Custom) | The default connection speed for any Ethernet connection using multiple networks. Valid values range from 100Mb to 20Gb in 100Mb increments. The 20Gb maximum speed is dependent on 20Gb NICs and the HP VC FlexFabric-20/40 F8 Module being present in the domain. |
| MaxSpeedType (optional) | The maximum connection speed for any Ethernet connection using multiple networks. Valid values are "Unrestricted" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Unrestricted". |
| MaxSpeed (required if MaxSpeedType is Custom) | The maximum connection speed for any Ethernet connection using multiple networks. Valid values range from 100Mb to 20Gb in 100Mb increments. The 20Gb maximum speed is dependent on 20Gb NICs and the HP VC FlexFabric-20/40 F8 Module being present in the domain. |
| VlanCapacity (optional) | The VLAN capacity mode. Valid values are "Legacy" and "Expanded". The default value is "Legacy". "Legacy" mode allows up to 320 VLANs per module and 28 VLANs per server connection. "Expanded" mode allows up to 8192 VLANs per domain and 162 VLANs per physical server port. |

| Item | Description |
|-----------------|--|
| Examples | |
| | ->set enet-vlan SharedServerVlanId=true Enables SharedServerVlanId |
| | ->set enet-vlan PrefSpeedType=Custom PrefSpeed=500 MaxSpeedType=Custom MaxSpeed=2500 Sets the preferred connection speed for all connections using multiple networks to 500Mb, and the maximum connection speed to 2.5Gb |
| | ->set enet-vlan VlanCapacity=Expanded Sets the VLAN capacity mode to Expanded to allow for larger network configurations |

| Item | Description |
|----------------|---|
| show enet-vlan | Display general Ethernet VLAN configuration settings. |
| Syntax | show enet-vlan |
| Example | |
| | ->show enet-vlan Displays Ethernet VLAN configuration settings |

external-manager

Manage external manager settings and information.

Supported actions: help, remove, set, show

| Item | Description |
|--|---|
| remove external-manager | Remove an existing external manager (VCEM) and regain local management profile control of the domain. When releasing the profile control, you must specify values for each MacType, WwnType, and ServerIdType. IMPORTANT: You must set the external manager enabled to "false" using the set external-manager command before using the remove external-manager command. |
| Syntax | remove external-manager [-quiet] [UserName=<username>] [MacType=<Factory-Default User-Defined>] [MacStart=<MAC address>] [MacEnd=<MAC address>] [WwnType=<Factory-Default User-Defined>] [WwnStart=<WWN address>] [WwnEnd=<WWN address>] [ServerIdType=<Factory-Default User-Defined>] [ServerIdStart=<ServerId address>] [ServerIdEnd=<ServerId address>] |
| Option | |
| quiet | This option suppresses user confirmation prompts and is useful when scripting operations. |
| Properties | |
| UserName (optional) | A valid external manager user name. The user name can be identified using the show external-manager command. |
| MacType (optional) | The type of MAC address source to use for assignment. Valid values include "Factory-Default" and "User-Defined". |
| MacStart (required if the MacType is User-Defined) | The starting MAC address in a custom user-defined range. This property is valid only if the MacType is set to "User-Defined". |

| Item | Description |
|--|--|
| MacEnd (required if the MacType is User-Defined) | The ending MAC address in a custom user-defined range. This property is valid only if the MacType is set to "User-Defined". |
| WwnType (optional) | The type of WWN address source to use for assignment. Valid values include "Factory-Default" and "User-Defined". |
| WwnStart (required if the WwnType is User-Defined) | The starting WWN address in a custom user-defined range |
| WwnEnd (required if the WwnType is User-Defined) | The ending WWN address in a custom user-defined range |
| ServerIdType (optional) | The type of the virtual serial number source. When server profiles are created, the virtual serial numbers and UUID values are allocated from the specified pool source. Valid values include "Factory-Default" and "User-Defined". |
| ServerIdStart (required if Type is User-Defined) | The starting serial number in a user-defined range. This property is only valid for user-defined serial number types. |
| ServerIdEnd (required if Type is User-Defined) | The ending serial number in a user-defined range. This property is only valid for user-defined serial number types. |
| Examples | |
| | <pre>->show external-manager ->set external-manager UserName=A17005068 Enabled=false (where A17005068 is the username reported by the previous command) ->remove external-manager username=A17005068 macType=User-Defined MacStart=00-17-A4-77-00-00 MacEnd=00-17-A4-77-03-FF wwnType=User-Defined WwnStart=50:06:0B:00:00:C2:62:00 WwnEnd=50:06:0B:00:00:C2:65:FF serverIdType=User-Defined serverIdStart=VCX0000000 serverIdEnd=VCX00000ZZ Displays the username, disables the external manager, and then removes the external manager and releases the profile control</pre> |
| | <pre>->remove external-manager UserName=A17005068 Removes only the external management control of the VC Manager</pre> |
| | <pre>->remove external-manager macType=Factory-Default wnnType=Factory-Default serverIdType=Factory-Default Releases only the profile control</pre> |
| | <pre>->remove external-manager username=A1010345 macType=Factory-Default wwnType=Factory-Default serverIdType=Factory-Default Removes the external manager and releases the profile control</pre> |

| Item | Description |
|----------------------|--|
| set external-manager | Enable or disable the control of an existing external manager over the Virtual Connect domain. |
| Syntax | set external-manager [-quiet] UserName=<username> Enabled=<true false> |
| Option | |
| quiet | Suppresses user confirmation prompts and is useful when scripting operations |
| Properties | |
| UserName (required) | A valid external manager user name. The user name can be identified using the show external-manager command. |
| Enabled (required) | Enables or disables the external manager. Valid values include "true" and "false". |
| Examples | |

| Item | Description |
|------|--|
| | ->set external-manager UserName=A17005068 Enabled=false Disables the external manager |
| | ->set external-manager UserName=A17005068 Enabled=true Enables the external manager |

| Item | Description |
|-----------------------|---|
| show external-manager | Display the information of an existing external manager. |
| Syntax | show external-manager |
| Example | |
| | ->show external-manager Displays the information of an existing external manager |

fabric

Manage Fibre Channel SAN fabrics.

Supported actions: add, help, remove, set, show

| Item | Description |
|-------------------|---|
| add fabric | Add a new fabric to the domain. If the QoS type for the domain is set to "CustomNoFcoe", then the fabric cannot include FCoE ports. If it does, the message "cannot add fabric when QoS configuration type is CustomNoFcoe" appears. For more information about setting the QoS type, see "qos (on page 97)." |
| Syntax | add fabric <Name> Bay=<BayNum> Ports=<PortList> [Type=<FabricAttach DirectAttach>] [Speed=<Auto 2Gb 4Gb 8Gb>] [LinkDist=<Auto Manual>] [PrefSpeedType=<Auto Custom>] [PrefSpeed=<100Mb-8Gb in 100Mb steps>] [MaxSpeedType=<UnRestricted Custom>] [MaxSpeed=<100Mb-8Gb in 100Mb steps>] |
| Parameter | |
| Name (required) | A unique name is required when new fabric is added to the domain. |
| Properties | |
| Bay (required) | The specific interconnect bay number with which the fabric is associated. |
| Ports (required) | A list of one or more logical FC ports to be added to the fabric. Each port is specified in the format "<port1>,<port2>,...", where "port" is the interconnect module port number to be added to the fabric, for example "1, 2, 3, 4" (affects all modules within a bay group). <ul style="list-style-type: none"> For HP VC FlexFabric 10Gb/24-port Modules, port numbers 1, 2, 3, and 4 correspond to ports X1, X2, X3, and X4, respectively. For HP VC FlexFabric-20/40 F8 Modules, port numbers 1, 2, 3, 4, 5, 6, 7, and 8 correspond to ports X1, X2, X3, X4, X5, X6, X7, and X8, respectively. Ports X1 through X4 support Ethernet and Fibre Channel traffic. Port pairs X5/X6 and X7/X8 carry a single type of network traffic, either Ethernet or Fibre Channel. |
| Type (optional) | The fabric type. "FabricAttach" is a SAN fabric. A "DirectAttach" fabric is directly connected to a supported storage device. A "DirectAttach" fabric is only allowed for a FlexFabric module. The default type is "FabricAttach". |

| Item | Description |
|---|--|
| Speed (optional) | <p>The port speed for the uplink ports in the fabric. Values include "Auto", "2Gb", "4Gb", and "8Gb". The default port speed is "Auto".</p> <p>Speed restrictions:</p> <ul style="list-style-type: none"> For the HP VC 4Gb FC Module, if the value is 8Gb, VCM translates the value to "Auto", allowing the module to connect to the SAN switch at optimal speed. For the HP VC 8Gb 24-Port FC Module, HP VC 8Gb 20-Port FC Module, HP VC FlexFabric 10Gb/24-port Module, and HP VC FlexFabric 20/40 F8 module, values include "Auto", "2Gb", "4Gb", and "8Gb". |
| LinkDist (optional) | <p>The login re-distribution scheme to use for load balancing. Values include "Auto" and "Manual". The default login re-distribution is "Manual" for a "FabricAttach" fabric.</p> <p>Login re-distribution is not supported for "DirectAttach" fabrics.</p> <p>The HP VC 4Gb FC Module, HP VC 8Gb 20-Port FC Module, and HP VC 8Gb 24-Port Module support only manual login redistribution. The HP VC FlexFabric 10Gb/24-port Module and HP VC FlexFabric 20/40 F8 Module support both auto and manual login redistribution.</p> |
| PrefSpeedType (optional) | Preferred connection speed for any FCoE connection attached to this fabric. Values are "Auto" and "Custom". "Custom" allows configuration of the preferred speed. The default value is "Auto" and can be configured only if the fabric has uplink ports from the FlexFabric interconnect module. |
| PrefSpeed (required if PrefSpeedType is "Custom") | The preferred connection speed for any FCoE connection attached to this fabric. Values range from 100Mb to 8Gb in 100Mb increments. This property can be configured only if the fabric has uplink ports from the FlexFabric interconnect module. |
| MaxSpeedType (optional) | The maximum connection speed for any FCoE connection attached to this fabric. Values are "Unrestricted" and "Custom". "Custom" allows the user to configure the speed. The default value is "Unrestricted". This property can be configured only if the fabric has uplink ports from the FlexFabric interconnect module. |
| MaxSpeed (required if MaxSpeedType is "Custom") | The maximum connection speed for any FCoE connection attached to this fabric. Values range from 100Mb to 8Gb in 100Mb increments. This property can be configured only if the fabric has uplink ports from the FlexFabric interconnect module. |
| Examples | |
| | <pre>->add fabric MyFabric1 Bay=3 Ports=1,2</pre> <p>Adds a new FabricAttach fabric, using default values</p> |
| | <pre>->add fabric MyFabric5 Bay=3 Ports=1,2 Type=DirectAttach</pre> <p>Adds a new DirectAttach fabric</p> |
| | <pre>->add fabric MyFabric2 Bay=3 Ports=1 Speed=2Gb</pre> <p>Adds a new fabric with speed set to 2Gb</p> |
| | <pre>->add fabric MyFabric3 Bay=3 Ports=1,2,3,4 LinkDist=Auto</pre> <p>Adds a new fabric with automatic login re-distribution</p> |
| | <pre>->add fabric MyFabric4 Bay=3 Ports=1,2</pre> <p>Adds a new fabric with two logical ports</p> |
| | <pre>->add fabric MyFabric4 Bay=3 Ports=1,2 PrefSpeedType=Custom PrefSpeed=4000 MaxSpeedType=Custom MaxSpeed=8000</pre> <p>Adds a new fabric with a preferred connection speed of 4Gb and maximum connection speed of 8Gb</p> |

| Item | Description |
|------------------|--|
| remove fabric | Remove an existing fabric from the domain. |
| Syntax | remove fabric <Name *> |
| Parameter | |
| Name (required) | The name of a specific fabric. Use "*" to remove all existing fabrics. |

| Item | Description |
|-----------------|--|
| Examples | |
| | ->remove fabric VFabric_1 Removes VC FC SAN fabric VFabric_1 |
| | ->remove fabric * Removes all VC FC SAN fabrics from the domain |

| Item | Description |
|--------------------------|--|
| set fabric | Modify properties of an existing fabric or force load balancing of a fabric if login re-distribution is configured. |
| Syntax | set fabric <Name> [-LoadBalance] [Name=<NewName>] [Ports=<PortList>] [Speed=<Auto 2Gb 4Gb 8Gb>] [LinkDist=<Auto Manual>] [PrefSpeedType=<Auto Custom>] [PrefSpeed=<100Mb-8Gb in 100Mb steps>] [MaxSpeedType=<UnRestricted Custom>] [MaxSpeed=<100Mb-8Gb in 100Mb steps>] |
| Parameter | |
| Name (required) | A unique name for the fabric |
| Option | |
| LoadBalance | Performs load balancing on a fabric configured for manual login re-distribution. This option is not supported for DirectAttach fabrics. |
| Properties | |
| Name (optional) | The new name of the fabric |
| Speed (optional) | The port speed for the uplink ports in the fabric. Values include "Auto", "2Gb", "4Gb", and "8Gb". The default port speed is "Auto". Speed restrictions: <ul style="list-style-type: none"> For the HP VC 4Gb FC Module, if the value 8Gb is chosen, VCM translates the value to "Auto", which allows the module to connect to the SAN switch at optimal speed. For the HP VC 8Gb 24-Port FC Module, HP VC 8Gb 20-Port FC Module, HP VC FlexFabric 10Gb/24-port Module, HP VC FlexFabric 20/40 F8 Module, valid speed values include "Auto", "2Gb", "4Gb", and "8Gb". |
| LinkDist (optional) | Specifies the login re-distribution scheme for load balancing. Values include "Auto" and "Manual". The default login re-distribution is "Manual" for a "FabricAttach" fabric. Login re-distribution is not supported for "DirectAttach" fabrics. The HP VC 4Gb FC Module, HP VC 8Gb 20-Port FC Module, and HP VC 8Gb 24-Port FC Module support only manual login re-distribution. The HP VC FlexFabric 10Gb/24-port Module and HP VC FlexFabric 20/40 F8 Module support both auto and manual login re-distribution. |
| Ports (optional) | A list of one or more logical FC ports to be added to the fabric. Specify each port in the format "<port1>,<port2>,...", where port is the interconnect module port being modified in the fabric (affects all modules within a bay group). <ul style="list-style-type: none"> For HP VC FlexFabric 10Gb/24-port Modules, port numbers 1, 2, 3, and 4 correspond to ports X1, X2, X3, and X4, respectively. For HP VC FlexFabric-20/40 F8 Modules, port numbers 1, 2, 3, 4, 5, 6, 7, and 8 correspond to ports X1, X2, X3, X4, X5, X6, X7, and X8, respectively. Ports X1 through X4 support Ethernet and Fibre Channel traffic. Port pairs X5/X6 and X7/X8 carry a single type of network traffic, either Ethernet or Fibre Channel. |
| PrefSpeedType (optional) | Preferred connection speed for any FCoE connection attached to this fabric. Values are "Auto" and "Custom". "Custom" allows the user to configure the speed. The default value is "Auto". This property is configured only if the fabric has uplink ports from the FlexFabric interconnect module. |

| Item | Description |
|--|--|
| PrefSpeed (required if PrefSpeedType is "Custom") | The preferred connection speed for any FCoE connection attached to this fabric. Values range from 100Mb to 8Gb in 100Mb increments. This property is configured only if the fabric has uplink ports from the FlexFabric interconnect module. |
| MaxSpeedType (optional) | The maximum connection speed for any FCoE connection attached to this fabric. Values are 'Unrestricted' and 'Custom'. 'Custom' allows the user to configure the speed. The default value is 'Unrestricted'. This property is configured only if the fabric has uplink ports from the FlexFabric interconnect module. |
| MaxSpeed (required if MaxSpeedType is "Custom") | The maximum connection speed for any FCoE connection attached to this fabric. Values range from 100Mb to 8Gb in 100Mb increments. This property can be configured only if the fabric has uplink ports from FlexFabric interconnect module. |
| Examples | |
| | ->set fabric MyFabric1 Name=MyNewName1 Changes the name of an existing fabric |
| | ->set fabric MyFabric2 Speed=2Gb LinkDist=Auto Modifies the port speed and login re-distribution |
| | ->set fabric MyFabric3 Ports=1,2,3,4 Modifies the fabric ports contained in the fabric |
| | ->set fabric MyFabric5 -loadBalance Performs load balancing on a fabric with manual login re-distribution |
| | ->set fabric MyFabric4 PrefSpeedType=Custom PrefSpeed=4000 MaxSpeedType=Custom MaxSpeed=8000 Modifies the fabric to preferred connection speed of 4Gb and maximum connection speed of 8Gb |

| Item | Description |
|------------------|--|
| show fabric | Display all fabric information. |
| Syntax | show fabric [<FabricName> *] |
| Parameter | |
| Name (optional) | Name of an existing fabric. Use "*" to display a detailed output of all fabrics in the VC domain. If not specified, a summary output of all fabrics appears. |
| Examples | |
| | ->show fabric Displays a summary of all FC SAN fabrics |
| | ->show fabric * Displays detailed information for all FC SAN fabrics |
| | ->show fabric SAN_5 Displays detailed information for a specific FC SAN fabric |

fc-connection

Manage Fibre Channel SAN connections.

Supported actions: add, help, remove, set, show

| Item | Description |
|-------------------|---|
| add fc-connection | Add a new FC SAN connection to an existing server profile. For more information, see "General requirements for adding FC or FCoE connections (on page 197)." |
| Syntax | add fc-connection <ProfileName> [Fabric=<FabricName>] [Speed=<Auto 1Gb 2Gb 4Gb 8Gb Disabled>] |

| Item | Description |
|---|--|
| | [AddressType=<Factory-Default User-Defined Pool-Specified>] [PortWWN=<WWN address>] [NodeWWN=<WWN address>] |
| Parameter | |
| ProfileName (required) | The name of an existing profile to which the new connection is added |
| Properties | |
| Fabric (optional) | The name of an existing fabric to associate with the connection. If the fabric name is not specified, the connection is marked as "Unassigned" and associated with a specific bay. |
| Speed (optional) | The port speed of the connection port. Values include "Auto", "1Gb", "2Gb", "4Gb", "8Gb", and "Disabled". If not specified, the default port speed is set to "Auto". Speed restrictions: For the HP VC 4Gb FC Module, supported speed values include "Auto", "1Gb", "2Gb", "4Gb", and "Disabled". If the value is set to 8Gb, the speed is auto-negotiated by VC. |
| AddressType (optional) | The source of WWN address assignments used during the creation of the new connection. If not specified, it defaults to the domain default. If "User-Defined" or "Pool-Specified" is specified, then both a Port WWN and Node WWN must also be specified. Values include "Factory-Default", "User-Defined", or "Pool-Specified". To use the "Pool-Specified" option, the domain WWN pool must be defined as VC-defined or user-defined and the listed addresses must be available in the current pool. |
| PortWWN (required if AddressType is User-Defined or Pool-Specified) | The user-defined Port WWN address to use for the connection. This property is required if the AddressType specified is "User-Defined" or "Pool-Specified". The PortWWN must be an unused WWN address. |
| NodeWWN (required if AddressType is User-Defined or Pool-Specified) | The user-defined Node WWN address to use for the connection. This property is required if the AddressType specified is "User-Defined" or "Pool-Specified". The NodeWWN must be an unused WWN address. |
| Examples | |
| | ->add fc-connection MyNewProfile Fabric=SAN_5 Adds a new FC SAN connection to a profile |
| | ->add fc-connection MyNewProfile Fabric=SomeFabric Speed=4Gb Adds a new FC SAN connection and configures the port speed |
| | ->add fc-connection MyNewProfile Adds a new FC SAN connection and uses the next available fabric |
| | ->add fc-connection MyNewProfile AddressType=Factory-Default Adds a new FC SAN connection and uses factory-default addresses |
| | ->add fc-connection MyNewProfile AddressType=User-Defined PortWWN=50:06:0B:00:00:C2:62:00 NodeWWN=50:06:0B:00:00:c2:62:01 Adds a new FC SAN connection and provides user-defined WWN addresses |
| | ->add fc-connection MyNewProfile AddressType=Pool-Specified PortWWN=50:06:0B:00:00:C2:62:00 NodeWWN=50:06:0B:00:00:c2:62:01 Adds a new FC SAN connection and specified an address from the VC-defined or user-defined pool |

| Item | Description |
|------------------------|---|
| remove fc-connection | Remove the last FC connection from an existing server profile. |
| Syntax | remove fc-connection <ProfileName> |
| Parameter | |
| ProfileName (required) | Name of the profile from which to remove the FC connection |
| Example | |
| | ->remove fc-connection MyProfile Removes an FC connection from a profile |

| Item | Description |
|--|--|
| set fc-connection | Modify an existing FC SAN connection. |
| Syntax | set fc-connection <ProfileName> <Port> [Fabric=<FabricName>] [Speed=<Auto 1Gb 2Gb 4Gb 8Gb Disabled>] [BootPriority=<priority>] [BootPort=<portName>] [BootLun=<LUN>] |
| Parameters | |
| ProfileName (required) | The name of the server profile containing the connection to modify |
| Port (required) | The port number of the connection being modified |
| Properties | |
| Fabric (optional) | The name of the FC SAN fabric associated with the connection. Associate the specified fabric with the same bay as the FC connection. A blank string makes the FC connection unassigned. |
| Speed (optional) | The port speed of the FC SAN connection. Values include "Auto", "8Gb", "4Gb", "2Gb", "1Gb", and "Disabled". Speed restrictions: For the HP VC 4Gb FC Module, supported speed values include "Auto", "1Gb", "2Gb", "4Gb", and "Disabled". If the value is set to 8Gb, the speed is auto-negotiated by VC. |
| BootPriority (optional) | Controls whether the FC HBA port is enabled for SAN boot and affects the BIOS boot order. Values include "BIOS", "Primary", "Secondary", and "Disabled". |
| BootPort (Required if the Boot Priority is either Primary or Secondary, otherwise optional) | The target WWPN of the controller interface on the Fibre Channel storage target. The port name is a 64-bit identifier in the format NN:NN:NN:NN:NN:NN:NN:NN, where N is a hexadecimal number. |
| BootLun (Required if the Boot Priority is either Primary or Secondary, otherwise optional) | The LUN of the volume used for SAN boot. Values include integers from 0 to 255 or 16 hex digits (HP-UX only). |
| Examples | |
| | ->set fc-connection MyProfile 1 Fabric=SAN_5 Changes the fabric of an FC SAN fabric connection |
| | ->set fc-connection RedProfile 2 Fabric="" Sets an FC SAN fabric connection to "Unassigned" |
| | ->set fc-connection BlueProfile 1 Fabric=SAN_7 Changes the FC SAN fabric of an FC SAN connection |

| Item | Description |
|------|---|
| | ->set fc-connection BlueProfile 1 Speed=4Gb Changes the port speed of an FC SAN connection |
| | ->set fc-connection BlueProfile 1 BootPriority=Primary BootPort=50:06:0B:00:00:C2:62:00 BootLun=5 Changes the SAN boot priority and sets additional boot parameters |

| Item | Description |
|-------------------------|--|
| show fc-connection | Display the FC SAN connections associated with the server profiles. |
| Syntax | show fc-connection [<ConnectionID>] |
| Parameter | |
| ConnectionID (optional) | The ID of an existing FC SAN connection. The ID format is <ProfileName:Port>. Use <ProfileName:*> to display all FC SAN connections of a profile. Use "*" to display all FC SAN connections in the domain. |
| Examples | |
| | ->show fc-connection Displays all FC SAN connections in the domain |
| | ->show fc-connection Profile1:* Displays all FC SAN connections of a profile named Profile1 |
| | ->show fc-connection Profile1:1 Displays a specific FC SAN connection of a profile named Profile1 |

fcoe-connection

Manage FCoE connections.

Supported actions: add, help, remove, set, show

| Item | Description |
|------------------------|---|
| add fcoe-connection | Add a new FCoE connection to an existing server profile. For more information, see "General requirements for adding FC or FCoE connections (on page 197)." If the QoS type for the domain is set to "CustomNoFcoe", a "cannot add fabric when QoS configuration type is CustomNoFcoe" error message appears. For more information about setting the QoS type, see "qos (on page 97)." |
| Syntax | add fcoe-connection <ProfileName> [Fabric=<FabricName> FcoeNetwork=<FcoeNetName>] [SpeedType=<1Gb 2Gb 4Gb 8Gb Auto Custom Preferred Disabled>] [CustomSpeed=<100Mb-8Gb 20Gb>] [WWNAddressType=<Factory-Default User-Defined Pool-Specified>] [PortWWN=<WWN address>] [NodeWWN=<WWN address>] [MACAddressType=<Factory-Default User-Defined Pool-Specified>] [EthernetMac=<MAC Address>] |
| Parameter | |
| ProfileName (required) | The name of an existing profile to which the new connection is added |
| Properties | |
| Fabric (optional) | The name of an existing fabric created on an FCoE module to associate with the connection. If the fabric name is not specified, the connection is marked as "Unassigned" and associated with a specific bay. |
| FcoeNetwork (optional) | The name of an existing FCoE network to associate with the connection. You cannot specify both Fabric and FcoeNetwork properties. If neither property |

| Item | Description |
|--|--|
| | is specified, then the connection is marked as "Unassigned" and is associated with a specific bay. |
| SpeedType (optional) | <p>The requested operation speed for the server port. Valid values are "1Gb", "2Gb", "4Gb", "8Gb", "Auto", "Custom", "Preferred", and "Disabled". The default value is "Preferred". "Auto" does not apply to fabrics, and "1Gb" to "8Gb" does not apply to FCoE networks.</p> <p>If the SpeedType is "Custom", you can configure a speed from 100Mb to MAX configured speed for the network in 100Mb increments.</p> <p>If the speed type is "Preferred", the speed of the FCoE connection is the same as the preferred speed of the fabric or FCoE network to which the connection is associated. If no preferred speed is configured for a fabric or FCoE network, Virtual Connect determines the speed.</p> |
| CustomSpeed (required if SpeedType is Custom) | <p>The user-defined speed for the server port. Valid values include 100Mb to 20Gb, or 100Mb to 8Gb for FCoE connections in a SAN fabric, configured in 100Mb increments.</p> <p>The 20Gb maximum speed is dependent on 20Gb NICs and the HP VC FlexFabric-20/40 F8 Module being present in the domain.</p> |
| WWNAddressType (optional) | <p>The source of WWN address assignments to be used during the creation of the new connection. If not specified, the default is the domain default. If "User-Defined" is specified, both a Port WWN and Node WWN must also be specified. Valid values are "Factory-Default", "User-Defined", or "Pool-Specified".</p> <p>To use the "Pool-Specified" option, the domain WWN pool must be defined as VC-defined or user-defined and the listed addresses must be available in the current pool.</p> |
| PortWWN (required if WWNAddressType is User-Defined or Pool-Specified) | The user-defined Port WWN address to use for the connection. The PortWWN must be an unused WWN address. |
| NodeWWN (required if WWNAddressType is User-Defined or Pool-Specified) | The user-defined Node WWN address to use for the connection. The NodeWWN must be an unused WWN address. |
| MACAddressType (optional) | <p>The source of MAC address assignments to be used during the creation of the new connection. If not specified, the default is the domain default. If "User-Defined" is specified, EthernetMAC must also be specified. Valid values are "Factory-Default", "User-Defined", or "Pool-Specified".</p> |
| EthernetMAC (required if MACAddressType is User-Defined or Pool-Specified) | The user-defined or pool-specified Ethernet MAC address to use for the connection |
| Examples | |
| | <pre>->add fcoe-connection MyNewProfile Fabric=SAN_5</pre> <p>Adds a new FCoE SAN fabric connection to a profile</p> |
| | <pre>->add fcoe-connection MyNewProfile FcoeNetwork=FCOE_NET_1</pre> <p>Adds a new FCoE network connection to a profile</p> |
| | <pre>->add fcoe-connection MyNewProfile Fabric=SomeFabric SpeedType=4Gb</pre> <p>Adds a new FCoE connection and configures the port speed</p> |
| | <pre>->add fcoe-connection MyNewProfile</pre> <p>Adds a new FCoE connection and leaves it unassigned</p> |
| | <pre>->add fc-connection MyNewProfile Fabric=MyFabric SpeedType=Custom CustomSpeed=5000</pre> <p>Adds a new FCoE connection and sets a custom speed of 5Gb</p> |

| Item | Description |
|------|---|
| | ->add fcoe-connection MyNewProfile WWNAddressType=Factory-Default Adds a new FCoE connection and uses factory-default WWN addresses |
| | ->add fcoe-connection MyNewProfile WWNAddressType=User-Defined PortWWN=50:06:0B:00:00:C2:62:00 NodeWWN=50:06:0B:00:00:C2:62:01 Adds a new FCoE connection and provides user-defined WWN addresses |
| | ->add fcoe-connection MyNewProfile WWNAddressType=Pool-Specified PortWWN=50:06:0B:00:00:C2:62:00 NodeWWN=50:06:0B:00:00:C2:62:01 Adds a new FCoE connection and provides WWN addresses from the VC-defined or user-defined pool |
| | ->add fcoe-connection MyNewProfile MACAddressType=Factory-Default Adds a new FCoE connection and uses factory-default MAC addresses |
| | ->add fcoe-connection MyNewProfile MACAddressType=User-Defined EthernetMAC=00-17-A4-77-00-00 Adds a new FCoE connection and provides a user-defined MAC address |
| | ->add fcoe-connection MyNewProfile MACAddressType=Pool-Specified EthernetMAC=00-17-A4-77-00-00 Adds a new FCoE connection and provides a MAC address from the VC-defined or user-defined pool |
| | ->add fcoe-connection MyProfile Fabric=MyFabric SpeedType=Preferred Adds a new FCoE connection and sets the speed type to "Preferred" |
| | ->add fcoe-connection MyProfile Fabric=MyFabric SpeedType=Preferred Adds a new FCoE connection and set the speed type to "Preferred" |

| Item | Description |
|------------------------|--|
| remove fcoe-connection | Remove the last FCoE connection from an existing server profile. |
| Syntax | remove fcoe-connection <ProfileName> |
| Parameter | |
| ProfileName (required) | The name of an existing profile from which the last FCoE connection is being removed |
| Example | |
| | ->remove fcoe-connection MyProfile Removes an FCoE connection from a profile |

| Item | Description |
|---------------------|--|
| set fcoe-connection | Modify an existing FCoE connection. |
| Syntax | set fcoe-connection <ConnectionID> [Fabric=<FabricName> FcoeNetwork=<FcoeNetName>] [SpeedType=<1Gb 2Gb 4Gb 8Gb Auto Custom Preferred Disabled>] [CustomSpeed=<100Mb-8Gb 20Gb>] [BootPriority=<priority>] [BootPort=<portName>] [BootLun=<LUN>] |
| Parameters | |
| ConnectionID | The ID of an existing FCoE connection. The format of the ID must be |

| Item | Description |
|---|--|
| (required) | <ProfileName:Port>. |
| Properties | |
| Fabric (optional) | The name of the fabric to associate with the connection. The fabric being specified should be associated with the same bay as the FCoE connection. |
| FcoeNetwork (optional) | The name of the FCoE network to associate with the connection. You cannot specify both Fabric and FcoeNetwork properties. |
| SpeedType (optional) | <p>The requested operational speed for the server. Valid values include "1Gb", "2Gb", "4Gb", "8Gb", "Auto", "Custom", "Preferred", and "Disabled". "Auto" does not apply to fabric and "1Gb" to "8Gb" do not apply to FCoE networks.</p> <p>If the SpeedType is "Custom", you can configure a speed from 100Mb to MAX configured speed for the network in 100Mb increments.</p> <p>If the speed type is "Preferred", the speed of the FCoE connection is the same as the preferred speed of the fabric or FCoE network to which the connection is associated. If no preferred speed is configured for a fabric or FCoE network, VC determines the speed.</p> |
| CustomSpeed (required if the SpeedType is "Custom") | <p>The user-defined speed for the server port. Valid values include 100Mb to 20Gb, or 100Mb to 8Gb for FCoE connections in a SAN fabric, configured in 100Mb increments.</p> <p>The 20Gb maximum speed is dependent on 20Gb NICs and the HP VC FlexFabric-20/40 F8 Module being present in the domain.</p> |
| BootPriority (optional) | Controls whether the FCoE HBA port is enabled for SAN boot and affects the BIOS boot order. Valid values include "BIOS", "Primary", "Secondary", and "Disabled". |
| BootPort (required if the Boot Priority is either "Primary" or "Secondary") | The target WWPN of the controller interface on the Fibre Channel storage target. The port name is a 64-bit identifier in the format NN:NN:NN:NN:NN:NN:NN:NN, where N is a hexadecimal number. |
| BootLun (required if the Boot Priority is either "Primary" or "Secondary") | The LUN of the volume used for SAN boot. Valid values include an integer from 0 to 255 or 16 hex digits (HP-UX only). |
| Examples | |
| | <pre>->set fcoe-connection MyProfile:1 Fabric=SAN_5</pre> <p>Changes the fabric of an FCoE SAN fabric connection</p> |
| | <pre>->set fcoe-connection RedProfile:2 Fabric=""</pre> <p>Sets a FCoE SAN fabric connection to "Unassigned"</p> |
| | <pre>->set fcoe-connection MyProfile:1 FcoeNet=FCOE_NET_1</pre> <p>Changes the FCoE network of an FCoE network connection</p> |
| | <pre>->set fcoe-connection MyProfile:1 SpeedType=Custom CustomSpeed=5000</pre> <p>Modifies the FCoE connection and sets a custom speed of 5Gb</p> |
| | <pre>->set fcoe-connection BlueProfile:1 BootPriority=Primary BootPort=50:06:0B:00:00:C2:62:00 BootLun=5</pre> <p>Changes the SAN boot priority and sets additional boot parameters</p> |

| Item | Description |
|------|--|
| | ->set fcoe-connection MyProfile:1 SpeedType=Preferred Modifies the FCoE connection and set the speed type "Preferred" |

| Item | Description |
|----------------------------|--|
| show fcoe-connection | Display the FCoE connections associated with the server profiles. |
| Syntax | show fcoe-connection [<ConnectionID>] |
| Parameter | |
| ConnectionID (optional) | The ID of an existing FCoE connection. The ID format is <ProfileName:Port>. Use <ProfileName:*> to display all FCoE connections of a profile. Use "*" to display all FCoE connections in the domain. |
| Examples | |
| | ->show fcoe-connection Displays all FCoE connections in the domain |
| | ->show fcoe-connection Profile1:* Displays all FCoE connections of a profile named Profile1 |
| | ->show fcoe-connection Profile1:1 Displays a specific FCoE connection of a profile named Profile1 |

firmware

Display the Virtual Connect interconnect module firmware version.

Support actions: help, show

| | |
|-----------------|--|
| show firmware | Display the firmware information for all interconnect modules in the domain. |
| Syntax | show firmware |
| Examples | |
| | ->show firmware Displays a summary listing of all firmware |
| | ->show firmware * Displays a detailed listing of all firmware |

To update firmware, use the HP BladeSystem c-Class Virtual Connect Support Utility. For more information on installing the firmware, see the HP BladeSystem c-Class Virtual Connect Support Utility documentation on the HP website (<http://www.hp.com/go/vc/manuals>).

igmp-group

Display interconnect module IGMP Group table information.

Supported actions: help, show

| Item | Description |
|------------------------|---|
| show igmp-group | Display interconnect module IGMP Group table information for the specified module. |
| Syntax | show igmp-group <ModuleID> |
| Parameter | |
| ModuleID (required) | The ID of the module for which to display the IGMP Group table. The ID is in the format of <EnclosureID>:<BayNumber>. |

| Item | Description |
|----------------|---|
| Example | |
| | ->show igmp-group enc0:1 Displays the IGMP Group information for the module in bay 1 of enclosure enc0 |

igmp



IMPORTANT: Users with server role permissions cannot modify IGMP settings when the VC domain is under VCEM control.

Manage Ethernet IGMP Snooping settings.

Supported actions: help, set, show

| Item | Description |
|-----------------------|--|
| set igmp | Modify Ethernet IGMP Snooping settings. |
| Syntax | set igmp [Enabled=<true false>] [Timeout=<interval>] [NoFlood=<true false>] |
| Properties | |
| Enabled (optional) | Enables or disables IGMP Snooping. Valid values are "true" and "false". |
| Timeout (optional) | The idle timeout interval (in seconds) for IGMP Snooping. Valid values include integers from 1-3600. The default IGMP idle timeout is 260 seconds. |
| NoFlood (optional) | Allow or prevent the flooding of unregistered multicast packets. Valid values are "true" and "false". This parameter can be "true" only when IGMP Snooping is enabled, otherwise flooding always occurs. |
| Examples | |
| | ->set igmp Enabled=true Enables IGMP Snooping |
| | ->set igmp Enabled=true Timeout=30 Enables IGMP Snooping and sets the idle timeout |
| | ->set igmp Enabled=true NoFlood=true Enables IGMP snooping and prevents the flooding of unregistered multicast packets |

| Item | Description |
|----------------|--|
| show igmp | Display Ethernet IGMP Snooping settings. |
| Syntax | show igmp |
| Example | |
| | ->show igmp Displays IGMP Snooping settings |

interconnect-mac-table

Display interconnect module MAC table information.

Supported actions: help, show

| Item | Description |
|-----------------------------|---|
| show interconnect-mac-table | Display interconnect module MAC table information for the specified module. |
| Syntax | show interconnect-mac-table <ModuleID> [FilterBy] |

| Item | Description |
|---------------------|--|
| Parameter | |
| ModuleID (required) | The ID of the module for which to display the MAC table. The ID is in the format of <EnclosureID>:<BayNumber>. |
| Option | |
| FilterBy (optional) | The MAC table output can be filtered by property. The output filter syntax used is Property=Value. |
| Examples | |
| | ->show interconnect-mac-table enc0:1 Displays the module MAC table for the module in bay 1 of enclosure enc0 |
| | ->show interconnect-mac-table enc0:1 Port=d6 Displays the module MAC table for the module in bay 1 of enclosure enc0 filtered to show only addresses on port d6 |
| | ->show interconnect-mac-table enc0:1 "MAC Address"=00:26:55:58:89:9d Displays the module MAC table for the module in bay 1 of enclosure enc0 filtered on a single MAC address |

interconnect

Manage I/O interconnect modules.

Supported actions: help, set, show

| Item | Description |
|-------------------|--|
| set interconnect | Modify the interconnect module host name setting. |
| Syntax | set interconnect [-quiet] [<EnclosureID>:<BayNumber>] [<Hostname=new_hostname>] |
| Option | |
| quiet | Suppresses user confirmation prompts. This option is useful when scripting operations. |
| Properties | |
| EnclosureID | The ID of the enclosure |
| BayNumber | The Virtual Connect IO bay number |
| Hostname | A string of characters that cannot be longer than 63 characters and must begin with an uppercase or lowercase alphabetic character. If the hostname parameter is set to "DEFAULT", the host name is set to the default VC host name. Host names beginning with "VCE" or "VC2040F8" are reserved. |
| Examples | |
| | ->set interconnect enc0:1 Hostname="DevelopmentNetworks" Sets the host name of interconnect bay 1 in enclosure enc0 to DevelopmentNetworks |
| | ->set interconnect enc0:2 Hostname="DEFAULT" Resets the host name of interconnect bay 2 in enclosure enc0 to the factory default |

| Item | Description |
|-------------------|---|
| show interconnect | Display all interconnect modules in the domain. |
| Syntax | show interconnect [<ModuleID> *] [-fip_snooping] [FilterBy] |
| Parameter | |

| Item | Description |
|---------------------|--|
| ModuleID (optional) | The ID of the interconnect module. Use "*" to display a detailed view of all modules in the VC domain. If not specified, a summary output of all modules appears. |
| FilterBy | Filter the output of the show command by the specified attribute. The option is specified in the format <columnID>=<value>. For example, to display FIP snooping info associated with UplinkSet up1, the option would be specified as UplinkSet=up1. There can be more than one Filter option specified for a single command, such as 'show interconnect enc0:1 -fip_snooping UplinkSet=up1 LAG=18'. |
| Option | |
| fip_snooping | Display FIP snooping information for the specified interconnect module. |
| Examples | |
| | ->show interconnect Displays a summary of all interconnect modules |
| | ->show interconnect * Displays detailed information for all interconnect modules |
| | ->show interconnect *:5 Displays detailed information for all enclosures with interconnect modules in interconnect bay number 5 |
| | ->show interconnect enc0:* Displays interconnect modules in all bays of a specific enclosure |
| | ->show interconnect enc0:3 Displays detailed information on a specific interconnect module in interconnect bay 3 of the primary enclosure |
| | ->show interconnect enc0:3 -fip_snooping Displays FIP snooping information on a specific interconnect module in interconnect bay 3 of the primary enclosure |

iscsi-boot-param

Manage iSCSI boot parameters within a domain.

NOTE: The iscsi-boot-param command does not currently support IPv6 addresses.

Supported actions: help, remove, set, show

| Item | Description |
|----------------------------|---|
| remove iscsi-boot-param | Remove all iSCSI boot parameters configured on the specified iSCSI connection. |
| Syntax | remove iscsi-boot-param <ConnectionID> |
| Parameter | |
| ConnectionID (required) | The ID of an existing iSCSI connection. The ID format is <ProfileName:Port>. To retrieve the port number of the iSCSI connection, use the show profile <ProfileName> command. |
| Example | |
| | ->remove iscsi-boot-param MyProfile1:1 Removes boot parameters configured on connection 1 of MyProfile1 |

| Item | Description |
|--|--|
| set iscsi-boot-param | Configure the basic iSCSI boot parameters on the specified iSCSI connection. |
| Syntax | <pre>set iscsi-boot-param <ConnectionID> [-maskSecret] [-maskMutualSecret] [BootOrder=<Primary Secondary Disabled USE-BIOS>] [LUN=<Logical Unit number>] [InitiatorName=<Initiator name>] [InitiatorIP=<IP address>] [Mask=<Netmask>] [Gateway=<Gateway>] [VlanID=<Vlan Id>] [TargetName=<Target Name>] [TargetIP=<Primary Target IP>] [TargetPort=<Primary Target Port>] [TargetIP2=<Alternate Target IP>] [TargetPort2=<Alternate Target Port >] [Authentication=<None CHAP CHAPM>] [Username=<username>] [Secret=<secret password>] [MutualUsername=<username>] [MutualSecret=<Mutual secret password>] [iSCSIBootParamDHCP=<Enabled Disabled>] [NetworkParamDHCP=<Enabled Disabled>] [DHCPVendorID=<VendorID>]</pre> |
| Parameter | |
| ConnectionID (required) | The ID of an existing iSCSI connection. The ID format is <ProfileName:Port>. To retrieve the port number of the iSCSI connection, use the show profile <ProfileName> command. |
| Options | |
| maskSecret (optional) | Enables you to interactively specify the CHAP secret password as a masked string at the command prompt. |
| maskMutualSecret (optional) | Enables you to interactively specify the mutual CHAP secret password as a masked string at the prompt. |
| Properties | |
| BootOrder (optional) | Enables or disables iSCSI boot. Values for enabling iSCSI boot include "Primary", "Secondary", or "USE-BIOS". The default value is "Disabled". |
| LUN (optional) | The LUN of the target, which identifies the volume to be accessed. Values for standard LUNs are 0 to 255 decimal values. Values for extended LUNs are 13- to 16-character hexadecimal values. The default value is 0. |
| InitiatorName (required if iSCSIBootParamDHCP is "Disabled") | The name used for the iSCSI initiator on the booting system. The initiator name length can be a maximum of 223 characters. If the initiator name string contains non-alphanumeric characters, it must be enclosed in quotation marks. |
| InitiatorIP (required if NetworkParamDHCP is "Disabled") | The IP address used by the iSCSI initiator. This value is in dotted decimal format. |
| Mask (required if NetworkParamDHCP is "Disabled") | The IP network mask used by the iSCSI initiator. This value is in dotted decimal format. |
| Gateway (optional) | The default IP route used by the iSCSI initiator. This value is in dotted decimal format. |
| VlanID (optional) | The VLAN number that the iSCSI initiator uses for all sent and received packets. Values range from 1 to 4094. |
| TargetName (required if iSCSIBootParamDHCP is "Disabled") | The name of the target from which to boot. The target name length is a maximum of 223 characters. If the name string contains non-alphanumeric characters, it must be enclosed in quotation marks. |
| TargetIP (required if iSCSIBootParamDHCP is "Disabled") | The primary IP address of the iSCSI target. |

| Item | Description |
|---|--|
| "Disabled") | |
| TargetPort (optional) | The TCP port associated with the primary target IP address. The default value is 3260. |
| TargetIP2 (optional) | The alternate target IP address to use if the primary target IP is unavailable. |
| TargetPort2 (required if TargetIP2 is specified) | The TCP port associated with the alternate target IP address. The default value is 3260. |
| Authentication (optional) | The initiator and target must agree on an authentication method, or the iSCSI initiator cannot log in to the target. Supported values include "None", "CHAP", and "CHAPM". The default value is "None". |
| Username (required if authentication type is CHAP or CHAPM) | The user name for authentication. The user name length is a maximum of 223 characters. If the name contains non-alphanumeric characters, it must be enclosed in quotation marks. |
| Secret (required if authentication type is CHAP or CHAPM) | The secret password for CHAP and CHAPM authentication. It is specified as a string or a long hex value (starting with 0x). This value must be at least 96 bits (12 bytes, 24 hex digits) and at most 128 bits (16 bytes, 32 hex digits) long. The CHAP secret password can be entered as clear text in the command or as a masked string at the prompt. |
| MutualUsername (required if authentication type is CHAPM) | The mutual user name for CHAPM authentication. The user name length is a maximum of 223 characters. If the name contains non-alphanumeric characters, it must be enclosed in double quotation marks. |
| MutualSecret (required if authentication type is CHAPM) | The mutual secret password for CHAPM authentication. The password should be specified as a string or a long hex value (starting with 0x). This value must be at least 96 bits (12 bytes, 24 hex digits) and at most 128 bits (16 bytes, 32 hex digits) long. The mutual secret password can be entered as clear text in the command or as a masked string at the prompt. |
| ISCSIBootParamDHCP (optional) | Enables the iSCSI option ROM to retrieve the iSCSI boot parameters from DHCP or through static configuration. Values are "Enabled" and "Disabled". The default value is "Disabled", which enables static configuration. |
| NetworkParamDHCP (optional) | Enables the iSCSI option ROM to retrieve the TCP/IP parameters from DHCP or through static configuration. Values are "Enabled" and "Disabled". The default value is "Disabled", which disables DHCP and enables static configuration. |
| DHCPVendorID (required if ISCSIBootParamDHCP is "Enabled") | The string used to match the value in the Vendor Class ID field in the DHCP offer packet when retrieving iSCSI boot parameters. |
| Examples | |

| Item | Description |
|------|--|
| | <pre>->set iscsi-boot-param MyProfile1:1 BootOrder=Primary Lun=100 InitiatorName="iqn.2009-09.com.someorg.iSCSI-Initiator" InitiatorIp=192.128.3.1 Mask=255.255.0.0 TargetName="iqn.2009-09.com.someorg.iSCSI-Target" TargetIp=192.128.3.2 TargetPort=40000 Authentication=CHAP Username=SomeUserName Secret=SomePassword123</pre> <p>Configures basic boot attributes on an iSCSI connection of profile MyProfile1</p> |
| | <pre>->set iscsi-boot-param MyProfile1:1 BootOrder=Primary ISCSIBootParamDHCP=Enabled NetworkParamDHCP=Enabled DHCPVendorID=SomeVendorIDValue</pre> <p>Configures iSCSI Boot attributes to be retrieved from DHCP</p> |
| | <pre>->set iscsi-boot-param MyProfile1:1 -maskSecret -maskMutualSecret Authentication=CHAPM Username=SomeUserName MutualUsername=SomeMutualUsername ISCSIBootParamDHCP=Enabled NetworkParamDHCP=Enabled DHCPVendorID=SomeVendorIDValue</pre> <p>Configures CHAP secret and CHAPM secret values as a masked string</p> |

| Item | Description |
|----------------------------|--|
| show iscsi-boot-param | Display the basic iSCSI boot parameters configured on the specified iSCSI connection. |
| Syntax | show iscsi-boot-param [<ConnectionID>] |
| Parameter | |
| ConnectionID (optional) | The ID of an existing iSCSI connection. The ID format is <ProfileName:Port>. Use show profile <ProfileName> or show iscsi-connection <profileName:*> to display the port number of the iSCSI connection. |
| Examples | |
| | <pre>->show iscsi-boot-param MyProfile1:1</pre> <p>Displays boot parameters configured on connection 1 of MyProfile1</p> |
| | <pre>->show iscsi-boot-param MyProfile1:*</pre> <p>Displays boot parameters configured on all connections of MyProfile1</p> |
| | <pre>->show iscsi-boot-param *</pre> <p>Displays boot parameters configured on all profiles in the domain</p> |

iscsi-connection

Manage iSCSI connections.

Supported actions: add, help, remove, set, show

| Item | Description |
|----------------------|---|
| add iscsi-connection | Add a new iSCSI connection to an existing server VC profile. This command can be executed only if the current VC domain is managing one or more Flex-10 modules. |
| Syntax | <pre>add iscsi-connection <ProfileName> [Network=<NetworkName>] [AddressType=<Factory-Default User-Defined Pool-Specified>] [iScsiMAC=<MAC Address>] [SpeedType=<Auto Preferred Custom Disabled>] [Speed=<speed>]</pre> |
| Parameter | |

| Item | Description |
|--|--|
| ProfileName (required) | The name of an existing profile to which the new connection is being added |
| Properties | |
| Network (optional) | The name of an existing network to associate with the connection. If the network name is not specified or is unassigned, it can be assigned later. |
| AddressType (optional) | <p>The source of MAC address assignments to be used during the creation of the new connection. If not specified, the default is the domain default. If "User-Defined" is specified, the iSCSI MAC address must be specified. Valid values include "Factory-Default", "User-Defined", or "Pool-Specified".</p> <p>IMPORTANT: "User-Defined" addresses within the domain address pool range are permanently depleted from the pool and can only be re-used as "User-Defined". Deleting the profile does not return the address to the pool. Deleting the domain is the only way to return "User-Defined" addresses to the pool.</p> <p>To use the "Pool-Specified" option, the domain MAC pool must be defined as VC-defined or user-defined, and the listed addresses must be available in the current pool.</p> |
| iScsiMAC (required if AddressType is User-Defined or Pool-Specified) | The user-defined iSCSI MAC address to use for the connection |
| SpeedType (optional) | <p>The requested operational speed for the server port. Valid values include "Auto", "Preferred", "Custom", and "Disabled". The default value is "Preferred".</p> <p>If the speed type is "Auto", the maximum port speed is allocated but is constrained by the maximum configured speed for the network.</p> <p>If the speed type is "Preferred", the speed of the network is the same as the preferred speed of the network to which the connection is associated. If no preferred speed is configured for a network, the speed type defaults to "Auto".</p> <p>If the speed type is "Custom", you can configure a speed (using the Speed property) from 100Mb to the MAX configured speed for the network in 100Mb increments.</p> <p>If the speed type is "Disabled", bandwidth is not allocated, and the server port status is "Administratively Disabled".</p> |
| Speed (required if the SpeedType is Custom) | The user-defined speed for the server port. Valid values include from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| Examples | |
| | <pre>->add iscsi-connection MyNewProfile Network=SomeNetwork</pre> <p>Adds a new iSCSI connection to the profile</p> |
| | <pre>->add iscsi-connection MyNewProfile</pre> <p>Adds a new iSCSI connection and leaves it unassigned</p> |
| | <pre>->add iscsi-connection MyNewProfile AddressType=Factory-Default</pre> <p>Adds a new iSCSI network connection and uses factory-default addresses</p> |
| | <pre>->add iscsi-connection MyNewProfile AddressType=User-Defined iScsiMAC=00-17-A4-77-00-00</pre> <p>Adds a new iSCSI network connection and provides a user-defined MAC address</p> |
| | <pre>->add iscsi-connection MyNewProfile AddressType=Pool-Specified iScsiMAC=00-17-A4-77-00-00</pre> <p>Adds a new iSCSI network connection and provides a MAC address from the VC-defined or user-defined pool</p> |

| Item | Description |
|------|--|
| | ->add iscsi-connection MyProfile Network=MyNetwork SpeedType=Preferred Adds a new iSCSI network connection and sets the speed to Preferred |
| | ->add iscsi-connection MyProfile Network=MyNetwork SpeedType=Custom Speed=2000 Adds a new iSCSI network connection and sets the speed to 2Gb |

| Item | Description |
|----------------------------|---|
| remove iscsi-connection | Remove the last iSCSI connection from the server VC profile. If no connections exist, an error message appears. |
| Syntax | remove iscsi-connection <ProfileName> |
| Parameter | |
| ProfileName (required) | The name of an existing profile from which the connection is being removed |
| Example | |
| | ->remove iscsi-connection MyProfile Removes the last added iSCSI connection from the profile |

| Item | Description |
|---|--|
| set iscsi-connection | Modify the properties of a specified iSCSI connection. |
| Syntax | set iscsi-connection <ConnectionID> [Network=<Network Name>] [SpeedType=<Auto Preferred Custom Disabled>] [Speed=<speed>] |
| Parameters | |
| ConnectionID (required) | The ID of an existing iSCSI connection. The ID format is <ProfileName:Port>. |
| Properties | |
| Network (optional) | The name of an existing network to associate with the connection. If the network name is not specified or is unassigned, it can be assigned later. |
| SpeedType (optional) | The requested operational speed for the server port. Valid values include "Auto", "Preferred", "Custom", and "Disabled". The default value is "Preferred". If the speed type is "Auto", the maximum port speed is allocated, constrained by the maximum configured speed for the network. If the speed type is "Preferred", the speed of the network is the same as the preferred speed of the network to which the connection is associated. If no preferred speed is configured for a network, it defaults to "Auto". If the speed type is "Custom", you can configure a speed (using the Speed property) from 100Mb to the MAX configured speed for the network in 100Mb increments. If the speed type is "Disabled", bandwidth is not allocated and the server port status is "Administratively Disabled". |
| Speed (required if the SpeedType is Custom) | The user-defined speed for the server port. Valid values include from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| Examples | |
| | ->set iscsi-connection MyNewProfile:1 Network=SomeNetwork Changes the network to a different one |
| | ->set iscsi-connection MyNewProfile:1 Network="" Unassigns the network from the connection |

| Item | Description |
|------|--|
| | ->set iscsi-connection MyProfile:1 Network=MyNetwork SpeedType=Preferred Modifies the speed to Preferred |
| | ->set iscsi-connection MyProfile:1 SpeedType=Custom Speed=2000 Modifies the iSCSI connection and sets the speed to 2Gb |

| Item | Description |
|----------------------------|---|
| show iscsi-connection | Display the iSCSI connections associated with the server profiles. |
| Syntax | show iscsi-connection [<ConnectionID>] |
| Parameter | |
| ConnectionID (optional) | The ID of an existing iSCSI connection. The ID format is <ProfileName:Port>. Use <ProfileName:*> to display all iSCSI connections of a profile. Use "*" to display all iSCSI connections in the domain. |
| Examples | |
| | ->show iscsi-connection Displays all iSCSI connections in the domain |
| | ->show iscsi-connection Profile1:* Displays all iSCSI connections of a profile named Profile1 |
| | ->show iscsi-connection Profile1:1 Displays a specific iSCSI connection of a profile named Profile1 |

lacp-timer

Manage the domain default LACP timer.

Supported actions: help, set, show

| Item | Description |
|--------------------|--|
| set lacp-timer | Set the domain default LACP timer. |
| Syntax | set lacp-timer default=<Short Long> |
| Properties | |
| Default (required) | Specifies whether the domain default LACP timer setting is short (one second) or long (30 seconds) |
| Examples | |
| | ->set lacp-timer default=Short Sets the domain default LACP timer to the short setting (one second) |
| | ->set lacp-timer default=Long Sets the domain default LACP timer to the long setting (30 seconds) |

| Item | Description |
|-----------------|---|
| show lacp-timer | Display the domain default LACP timer setting. |
| Syntax | show lacp-timer |
| Example | |
| | ->show lacp-timer Displays the current domain default LACP timer |

ldap-certificate

View and upload LDAP certificates from a remote FTP server.

Supported actions: help, load, remove, show

| Item | Description |
|-----------------------|--|
| load ldap-certificate | Download an LDAP certificate from a remote server using FTP or SFTP and apply it to the VC domain. |
| Syntax | load ldap-certificate Address=<ftp://user:password@IPAddress/filename> -or- load ldap-certificate Address=<ftp://user:password@ipaddress> Filename=<name> |
| Properties | |
| Address (required) | A valid IP address or host name of the server, including user name, password, and name of the certificate file on the server. Place brackets around the IPv6 address in the FTP URL. If the domain is in FIPS mode, SFTP must be used. |
| Filename (required) | The name of the LDAP certificate file on the server. The filename can also be given separately. The file path given will be treated as relative to the login directory for the user on the FTP server. The user should ensure that the permissions are appropriate for the transfer to succeed. |
| Examples | |
| | ->load ldap-certificate Address=ftp://user:password@192.168.10.12/new-ldap.crt Downloads LDAP certification from the remote FTP server |
| | ->load ldap-certificate Address=ftp://user:password@192.168.10.12 filename=/new-ldap.crt Downloads LDAP certification from the remote FTP server |
| | ->load ldap-certificate address=ftp://user:password@[2001:1::1]/new-ldap.crt Downloads LDAP certification from the remote FTP server using an IPv6 address |
| | ->load ldap-certificate address=ftp://user:password@[2001:1::1] filename=/new-ldap.crt Downloads LDAP certification from the remote FTP server using an IPv6 address |

| Item | Description |
|----------------------------|--|
| remove ldap-certificate | Remove an existing LDAP certificate. |
| Syntax | remove ldap-certificate <SerialNumber *> |
| Parameter | |
| SerialNumber (required) | The serial number of an existing LDAP certificate. Use "*" to remove all configured LDAP certificates. |
| Examples | |
| | ->remove ldap-certificate B4:02:C0:29:B5:E5:B4:81 Removes an existing LDAP certificate by serial number |
| | ->remove ldap-certificate * Removes all LDAP certificates |

| Item | Description |
|-------------------------|--|
| show ldap-certificate | Display LDAP certificate information. |
| Syntax | show ldap-certificate [<SerialNumber> *] |
| Parameter | |
| SerialNumber (optional) | The serial number of an existing LDAP certificate in a colon format. Use "*" to display detailed output of all the LDAP certificates in the VC domain. If an LDAP certificate is not specified, a summary output of all the LDAP certificates appears. |
| Examples | |
| | ->show ldap-certificate Displays a summary of all LDAP certificates |
| | ->show ldap-certificate * Displays detailed information for all LDAP certificates |
| | ->show ldap-certificate B4:02:C0:29:B5:E5:B4:81 Displays detailed information for a specific LDAP certificate |

ldap-group

Manage Virtual Connect directory groups.

Supported actions: add, help, remove, set, show

| Item | Description |
|------------------------|--|
| add ldap-group | Add a new directory group to the directory services configuration. |
| Syntax | add ldap-group <GroupName> [Description=<string>] [Roles=domain,server,network,storage] |
| Parameters | |
| GroupName (required) | The name of the LDAP directory group being added |
| Properties | |
| Description (optional) | An informational description for the new group being added |
| Roles (optional) | A set of one or more privileges for the group. Valid values are any combination of "domain", "server", "network", and "storage". Separate multiple values with commas. |
| Example | |
| | ->add ldap-group MyNewGroup Description="Test Group" Roles=domain,server Adds a new directory group |

| Item | Description |
|----------------------|---|
| remove ldap-group | Remove an existing directory group. |
| Syntax | remove ldap-group <GroupName *> |
| Parameter | |
| GroupName (required) | The name of an existing directory group to be removed. Use "*" to remove all LDAP groups. |
| Examples | |

| Item | Description |
|------|--|
| | ->remove ldap-group MyGroup Removes a specified directory group |
| | ->remove ldap-group * Removes all directory groups |

| Item | Description |
|------------------------|--|
| set ldap-group | Modify the properties of an existing directory group. |
| Syntax | set ldap-group <GroupName> [Description=<description>] [Roles=<roles>] |
| Parameter | |
| GroupName (required) | The name of an existing group to modify |
| Properties | |
| Description (optional) | A user-friendly description for the group |
| Roles (optional) | A set of one or more privileges for the group. Valid values are any combination of "domain", "server", "network", and "storage". Separate multiple values with commas. |
| Example | |
| | ->set ldap-group MyGroup Description="Test Group" Roles=domain,server,network Modifies a directory group description and privileges |

| Item | Description |
|----------------------|--|
| show ldap-group | Display the existing directory groups. |
| Syntax | show ldap-group [<GroupName> *] |
| Parameter | |
| GroupName (optional) | The name of an existing LDAP group in the domain. Use "*" to display detailed information for all LDAP groups. If no value is specified, a summary of all groups displays. |
| Examples | |
| | ->show ldap-group Displays a summary of all LDAP groups |
| | ->show ldap-group MyGroup Displays detailed information for a specific LDAP group |
| | ->show ldap-group * Displays detailed information for all LDAP groups |

ldap

Manage VC directory server authentication settings.

Supported actions: help, set, show

| Item | Description |
|---------------|--|
| set ldap | Modify and test the VC LDAP directory server authentication settings. |
| Syntax | set ldap [-test] [Enabled=<true false>] [LocalUsers=<enabled disabled>] [NtAccountMapping=<enabled disabled>] [ServerAddress=<IPAddress DNSname>] [SslPort=<portNum>] |

| Item | Description |
|-----------------------------|--|
| | [SearchContext1=<string>] [SearchContext2=<string>] [SearchContext2=<string>] |
| Option | |
| Test (optional) | Tests the LDAP configuration without applying changes. |
| Properties | |
| Enabled (optional) | Enables or disables LDAP authentication. Values include "true" and "false". |
| LocalUsers (optional) | Enables or disables local user authentication. Values include "Enabled" and "Disabled". WARNING: Disabling local users without correctly configuring LDAP authentication first might result in not being able to log on. Enabling and disabling local user authentication requires you to be logged in as an LDAP user. This property cannot be modified if you are logged in as a local user. |
| NtAccountMapping (optional) | Enables or disables Microsoft Windows NT account mapping. This capability enables you to enter "domain\username". Values include "Enabled" and "Disabled". |
| SearchContext1 (optional) | First searchable path used to locate the user when authenticating using directory services |
| SearchContext2 (optional) | Second searchable path used to locate the user when authenticating using directory services |
| SearchContext3 (optional) | Third searchable path used to locate the user when authenticating using directory services |
| ServerAddress (optional) | The IPv4 address or host name of the LDAP server used for authentication. |
| SslPort (optional) | The port to use for LDAP communication. Values include a valid port number between 1 and 65535. The default port number is 636. |
| Examples | |
| | ->set ldap -test Enabled=true ServerAddress=192.168.0.27 Tests the directory service changes without applying them |
| | ->set ldap -test Enabled=true ServerAddress=2001::34 Uses an IPv6 address for the server to test the directory service changes without applying them |
| | ->set ldap Enabled=true ServerAddress=192.168.0.124 SslPort=636 SearchContext1="ou=users,dc=company,dc=com" Enables directory services authentication for users |
| | ->set ldap Enabled=true ServerAddress=2001::50 SslPort=636 SearchContext1="ou=users,dc=company,dc=com" Enables directory services authentication for users using an IPv6 address |

| Item | Description |
|----------------|--|
| show ldap | Display the VC LDAP authentication settings. |
| Syntax | show ldap |
| Example | |
| | ->show ldap Displays LDAP information |

link-dist-interval

Manage the FC login re-distribution interval.

Supported actions: help, set, show

| Item | Description |
|---------------------------|---|
| set link-dist-interval | Set the FC login re-distribution interval for uplinks that are part of a fabric configured for Automatic login re-distribution. |
| Syntax | set link-dist-interval Interval=<1-1800> |
| Property | |
| Interval (required) | FC login re-distribution interval for uplinks (in seconds). Valid values include positive integers in the range 1 to 1800. The default is 30 seconds. |
| Example | |
| | ->set link-dist-interval interval=10 Sets the FC login re-distribution interval to 10 seconds |

| Item | Description |
|----------------------------|--|
| show link-dist-interval | Display the FC login re-distribution interval for uplinks that are part of a fabric configured for Automatic login redistribution. |
| Syntax | show link-dist-interval |
| Example | |
| | ->show link-dist-interval Displays the FC login re-distribution interval |

lldp

Configure and display LLDP information received on a specified port.

Supported actions: set, show, help

| Item | Description |
|---------------------------|--|
| set lldp | Sets LLDP configuration for lldp on external uplink ports. |
| Syntax | show lldp enhancedTlv=<true false> |
| Parameter | |
| enhancedTlv (required) | Configures the TLV structure. Valid values are 'true' and 'false'. Modifying this parameter impacts any service that queries this information for network topology information. Configuring to true enables the enhanced TLV format: <ul style="list-style-type: none">• System Name (<hostname><serial_number>BAY:<bay_number>)• Chassis ID (ENC:<enclosure_name>:SERIAL NO:<enclosure_serial_number>)• Port Description (<op_speed>/<connector_type>) Configuring to false enables the default format: <ul style="list-style-type: none">• System Name (<hostname>)• Chassis ID (<switch_mac_address>)• Port Description (IF-MIB::ifDesc value), for example (HP VC FlexFabric 10Gb/24-Port Module 4.10 X1) |
| Example | |
| | ->set lldp enhancedTlv=true Modifies the LLDP enhanced TLV configuration setting for LLDP on external uplink |

| Item | Description |
|------|-------------|
| | ports. |

| Item | Description |
|------------------------|--|
| <code>show lldp</code> | Display LLDP information received on the specified port. |
| Syntax | <code>show lldp <PortID></code> |
| Parameter | |
| PortID (required) | The port ID of the port for which to display LLDP information. PortID is composed of <EnclosureID>:<BayNumber>:<PortLabel>. A listing of the possible uplink PortIDs can be obtained by entering the <code>show uplinkport</code> command. Module downlink PortLabels range from d1 through d16, depending on the enclosure configuration. |
| Example | |
| | -> <code>show lldp enc0:1:X1</code> Displays LLDP information received on port X1 of the module in bay1 of enclosure enc0 |
| | -> <code>show lldp enc0:1:Q1.1</code> Displays LLDP information received on QSFP+ port Q1.1 of the module in bay 1 of enclosure enc0 |
| | -> <code>show lldp</code> Displays the LLDP enhanced TLV setting of the domain. |

local-users

Modify the local user authentication settings for the VC domain.

Supported actions: help, set, show

| Item | Description |
|--|---|
| <code>set local-users</code> | Modify the local user authentication settings for the VC domain. |
| Syntax | <code>set local-users [Enabled=<true false>] [PrimaryRemoteAuthenticationMethod=<none ldap radius tacacs>]</code> |
| Properties | |
| Enabled (optional) | Enables or disables local user authentication for the VC domain. Valid values are "true" and "false". The default value is "true". Disabling or enabling local user authentication requires you to be logged in as an LDAP, RADIUS or TACACS user with domain privileges. This property cannot be modified if you are logged in as a local user. Disabling local user authentication without specifying the PrimaryRemoteAuthenticationMethod is not allowed. |
| PrimaryRemote Authentication Method (optional) | The primary authentication mechanism that triggers the re-enablement of local user authentication (if it was disabled), in case the remote authentication servers are found to be unavailable during login by a remote VCM user. Valid values include "none", "ldap", "radius", and "tacacs". The default value is "none". |
| Example | |
| | -> <code>set local-users Enabled=false PrimaryRemoteAuthenticationMethod=tacacs</code> Disables local user authentication |

| Item | Description |
|------------------|---|
| show local-users | Display local user authentication settings for the VC domain. |
| Syntax | show local-users |
| Example | |
| | ->show local-users Displays local user authentication settings |

log-target

Manage remote log destination settings.

Supported actions: add, help, remove, set, show, test

| Item | Description |
|------------------------|---|
| add log-target | Add a new remote log destination. |
| Syntax | add log-target <Destination=IPAddress DNS> [Severity=<Critical Error Warning Info>] [Transport=<TCP UDP>] [Port=<1-65535>] [Security=<None STunnel>] [Format=<RFC3164 ISO8601>] [State=<Enabled Disabled>] |
| Properties | |
| Destination (required) | The IP address or the DNS name of the remote log destination. |
| Severity (optional) | The severity of the log messages that should be sent to the specified destination. Values include "Critical", "Error", "Warning", and "Info". The default value is "Info". |
| Transport (optional) | The transport protocol to be used for sending the log messages to the destination. Values include "TCP" and "UDP". The default value is "UDP". When the domain is in FIPS mode, TCP is the transport protocol. |
| Port (optional) | The port to be used on the destination to send the log messages. Values include 1 to 65536. The default value is 514. |
| Security (optional) | Secure transmission of the log messages. Values include "None" and "STunnel". The default value is "None", and no encryption is used during transmission. The "STunnel" option can be used only if the transport protocol is set to "TCP". When the domain is in FIPS mode, STunnel is the encryption for the connection. |
| Format (optional) | The timestamp format for the log messages. Values include "RFC3164" (Nov 26 13:15:55) and "ISO8601" (1997-07-16T19:20:30+01:00). The default value is "RFC3164". |
| State (optional) | Enables or disables the remote log destination. Values include "Enabled" and "Disabled". The default value is "Disabled". |
| Example | |
| | ->add log-target Destination=192.168.2.1 Port=600 Format=ISO8601 State=Enabled Adds log-target 192.168.2.1 |
| | ->add log-target Destination=2001::34 Port=600 Format=ISO8601 State=Enabled Adds log target destination using the IPv6 address of 2001::34 |

| Item | Description |
|-------------------|--|
| remove log-target | Remove an existing remote logging destination. |

| Item | Description |
|------------------|--|
| Syntax | remove log-target <ID> |
| Parameter | |
| ID (required) | The index of the remote log destination to delete |
| Example | |
| | ->remove log-target 3 Removes log-target index number 3 |

| Item | Description |
|------------------------|--|
| set log-target | Modify the properties of an existing remote log destination. |
| Syntax | set log-target <ID> [Destination=<IPAddress DNS>] [Severity=<Critical Error Warning Info>] [Transport=<TCP UDP>] [Port=<1-65535>] [Security=<None STunnel>] [Format=<RFC3164 ISO8601>] [State=<Enabled Disabled>] |
| Parameter | |
| ID (required) | The index of the remote log destination to modify |
| Properties | |
| Destination (optional) | The IP address or the DNS name of the previously configured remote log destination |
| Severity (optional) | Severity of the log messages that should be sent to the specified destination. Values include "Critical", "Error", "Warning", and "Info". The default value is "Info". |
| Transport (optional) | The transport protocol to be used for sending the log messages to the destination. Values include "TCP" and "UDP". The default value is "UDP". |
| Port (optional) | The port to be used on the destination to send the log messages. Values include 1 to 65536. The default value is 514. |
| Security (optional) | Secure transmission of the log messages. Values include "None" and "STunnel". The Default value is "None", and no encryption is used during transmission. The "STunnel" option can be used only if the transport protocol is set to "TCP". |
| Format (optional) | The timestamp format for the log messages. Values include "RFC3164" (Nov 26 13:15:55) and "ISO8601" (1997-07-16T19:20:30+01:00). The default value is "RFC3164". |
| State (optional) | Enables or disables the remote log destination. Values include "Enabled" and "Disabled". The default value is "Disabled". |
| Examples | |
| | ->set log-target 1 Severity=Error Transport=TCP Security=STunnel Modifies log-target index number 1 |
| | ->set log-target 1 Destination=192.168.3.1 Modifies log-target at index 1 to use a new IP address |
| | ->set log-target 1 Destination=2001:0db8:85a3:0000:0000:8a2e:0370:7334 Modifies log-target at index 1 to use a new IPv6 address |

| Item | Description |
|------------------|--|
| show log-target | Display the remote log destination settings. |
| Syntax | show log-target [<ID *>] |
| Parameter | |
| ID (optional) | The index of the remote log destination to view. Use "*" to display detailed |

| Item | Description |
|----------------|--|
| | information for all remote log destinations. |
| Example | |
| | ->show log-target Displays all log destination settings |

| Item | Description |
|-----------------|---|
| test log-target | Send a test message to all enabled remote log destinations. |
| Syntax | test log-target |
| Example | |
| | ->test log-target Sends a test message all log-targets |

loop-protect

The loop-protect command is deprecated in 4.00. HP recommends using the port-protect command. For information about port-protect settings, see "port-protect (on page 87)."

Manage loop protection settings.

Supported actions: help, reset, set, show

| Item | Description |
|--------------------|--|
| reset loop-protect | Reset and restart loop detection for all server ports in a "loop-detected" error condition. |
| Syntax | reset loop-protect |
| Example | |
| | ->reset loop-protect Resets and restarts loop detection for all server ports in a "loop-detected" error condition |

| Item | Description |
|--------------------|---|
| set loop-protect | Configure the loop protection settings. |
| Syntax | set loop-protect [-quiet] Enabled=<true false> |
| Option | |
| quiet (optional) | Suppresses user confirmation prompts |
| Properties | |
| Enabled (required) | Enables or disables network loop detection and protection. Valid values include "true" and "false". |
| Example | |
| | ->set loop-protect Enabled=true Enables loop protection |

| Item | Description |
|-------------------|--|
| show loop-protect | Display the loop protection configuration and all Ethernet ports currently disabled due to protection enforcement. |
| Syntax | show loop-protect |
| Example | |

| Item | Description |
|------|---|
| | ->show loop-protect Displays the current loop protection configuration and all Ethernet ports currently disabled due to protection enforcement |

mac-cache

Manage Ethernet MAC cache failover settings.

Supported actions: help, set, show

| Item | Description |
|--------------------|---|
| set mac-cache | Modify Ethernet MAC cache failover settings. |
| Syntax | set mac-cache [Enabled=<true false>] [Refresh=<interval>] |
| Properties | |
| Enabled (optional) | Enables or disables MAC cache failover. Valid values include "true" and "false". |
| Refresh (optional) | The refresh interval for the MAC Cache (in seconds). Valid values include integers from 1 to 30. The default refresh interval is 5 seconds. |
| Examples | |
| | ->set mac-cache Enabled=true Enables MAC cache failover |
| | ->set mac-cache Enabled=true Refresh=10 Enables MAC cache failover and sets the refresh interval |

| Item | Description |
|----------------|---|
| show mac-cache | Display Ethernet MAC cache failover settings. |
| Syntax | show mac-cache |
| Example | |
| | ->show mac-cache Displays Ethernet MAC cache failover settings |

mcast-filter-rule

Manage new Multicast Filter rules for a Multicast filter.

Supported actions: add, help, remove

| Item | Description |
|------------------------|--|
| add mcast-filter-rule | Create a new Multicast Filter rule for a Multicast filter. |
| Syntax | add mcast-filter-rule McastFilter=<FilterName> Networks=<IP Address>/<mask>[, <IP Address>/<mask>] |
| Properties | |
| McastFilter (required) | The name of an existing Multicast Filter to which the Multicast Filter rules belong |
| Network (required) | Multicast IP Addresses in the form of IP Address/Netmask Bits. The IP Address must be unique and should be the starting address of an IP subnet. |
| Examples | |
| | add mcast-filter-rule McastFilter=MyNewfilter Networks=224.12.0.0/16,224.20.23.4/32, |

| Item | Description |
|------|--|
| | 224.11.11.3/32 Creates a new Multicast Filter rule for a Multicast Filter |

| Item | Description |
|--------------------------|--|
| remove mcast-filter-rule | Remove a Multicast Filter rule from a Multicast filter. |
| Syntax | remove mcast-filter-rule McastFilter=<FilterName> [Network=<IP Address> *] |
| Properties | |
| McastFilter (required) | The name of an existing Multicast Filter to which the Multicast Filter rule belongs |
| Network (required) | Network IP Addresses in the form of IP Address/Netmask Bits. The IP Address must be a unique mcast address and should be the starting address of an IP subnet. A Network named "*" removes all the filter rules. |
| Examples | |
| | ->remove mcast-filter-rule McastFilter=Filter1 Network=224.0.0.1/32 Removes a Multicast Filter rule from an existing filter |
| | ->remove mcast-filter-rule McastFilter=MyFilter Network=* Removes all Multicast Filter rules from a Multicast Filter |

mcast-filter-set

Manage Multicast Filtersets.

Supported actions: add, help, remove, set, show

| Item | Description |
|----------------------------------|--|
| add mcast-filter-set | Create a Multicast Filterset. |
| Syntax | add mcast-filter-set <McastFilterSetName> [Labels=<Label1>[<Label2>, ...] [Color=<red green blue orange purple>] |
| Parameter | |
| McastFilterSetName (required) | Unique name of the Multicast Filterset to create |
| Properties | |
| Labels (optional) | Labels assigned to this Multicast Filterset. Labels are used in the GUI to help manage large numbers of filters. Labels can be assigned in the CLI, but are only used in the GUI. A maximum of 16 labels can be assigned. |
| Color (optional) | Color assigned to this Multicast Filterset. Color is used in the GUI to help manage large numbers of filters. A color can be assigned in the CLI, but is only used in the GUI. Allowed colors are red, green, blue, purple, or orange. |
| Examples | |
| | ->add mcast-filter-set MyMcastFilterSet Creates a new Multicast Filterset and adds it to the domain |
| | ->add mcast-filter-set Filterset1 Labels="label1, label2" Creates a new Multicast Filterset with labels label1 and label2 |
| | ->add mcast-filter Filterset1 Color=red |

| Item | Description |
|------|--|
| | Creates a new Multicast Filterset with color red |

| Item | Description |
|----------------------------------|--|
| remove mcast-filter-set | Remove a Multicast Filterset. |
| Syntax | remove mcast-filter-set McastFilterSetName> * |
| Parameter | |
| McastFilterSetName (required) | The name of an existing Multicast Filterset in the domain. A Multicast Filterset name of "*" removes all the Filtersets. |
| Examples | |
| | ->remove mcast-filter-set FilterSet1 Removes a Multicast Filterset |
| | ->remove mcast-filter-set * Removes all Multicast Filtersets |

| Item | Description |
|----------------------------------|--|
| set mcast-filter-set | Modify the Multicast Filterset. |
| Syntax | set mcast-filter-set <McastFilterSetName> [Name=<newName>] [Labels=<Label1>[<Label2>, ...] [Color=<red green blue orange purple>] |
| Parameter | |
| McastFilterSetName (required) | The unique name of the Multicast Filterset to modify |
| Properties | |
| Name (optional) | The new name of the Multicast Filterset |
| Labels (optional) | Labels assigned to this Multicast Filterset. Labels are used in the GUI to help manage large numbers of filter sets. Labels can be assigned in the CLI, but are only used in the GUI. A maximum of 16 labels can be assigned |
| Color (optional) | Color assigned to this Multicast Filterset. Color is used in the GUI to help manage large numbers of filter sets. A color can be assigned in the CLI, but is only used in the GUI. Allowed colors are red, green, blue, purple, or orange. |
| Examples | |
| | ->set mcast-filter-set Blue Name=Red Changes the name of an existing Multicast Filterset from "Blue" to "Red" |
| | ->set mcast-filter-set FilterSet1 Labels="label1, label2" Adds labels to a Multicast Filterset |
| | ->set mcast-filter-set FilterSet1 Labels= Removes all labels from a filter |
| | ->set mcast-filter-set FilterSet1 Color=red Sets the Network color to red |

| Item | Description |
|-----------------------|---|
| show mcast-filter-set | Display Multicast Filterset information. |
| Syntax | show mcast-filter-set [McastFilterSetName> *] |
| Parameter | |

| Item | Description |
|-------------------------------|---|
| McastFilterSetName (required) | The name of an existing Multicast Filterset in the domain. A Multicast Filterset named "*" removes all the filters. |
| Examples | |
| | ->show mcast-filter-set Displays a summary listing of all Multicast Filtersets |
| | ->show mcast-filter-set * Displays detailed information for all networks |
| | ->show mcast-filter-set MyNetwork Displays detailed information for a specific network |

mcast-filter

Monitor and manage multicast group membership for hosts subscribing to IGMP multicast traffic.

Supported actions: help, add, remove, set, show

| Item | Description |
|----------------------------|--|
| add mcast-filter | Add a Multicast Filter. |
| Syntax | add mcast-filter <McastFilterName> [Labels=<Label1>[<Label2>, ...] [Color=<red green blue orange purple>] |
| Parameter | |
| McastFilterName (required) | The unique name of the Multicast Filter to create. The name can be 1-64 characters long with alphanumeric characters and "_" (underscore), or "-" (dash). |
| Properties | |
| Labels (optional) | Labels assigned to the multicast filter. Labels are used in the GUI to help manage large numbers of filters. Labels can be assigned in the CLI, but are only used in the GUI. A maximum of 16 labels can be assigned. |
| Color (optional) | Color assigned to the multicast filter. Color is used in the GUI to help manage large numbers of filters. A color can be assigned in the CLI, but is only used in the GUI. Allowed colors are red, green, blue, purple, or orange. |
| Examples | |
| | ->add mcast-filter MyMcastFilter Creates a new Multicast Filter and adds it to the domain |
| | ->add mcast-filter Filter1 Labels="label1, label2" Creates a new Multicast Filter with labels label1 and label2 |
| | ->add mcast-filter Filter1 Color=red Creates a new Multicast Filter with color red |

| Item | Description |
|----------------------------|---|
| remove mcast-filter | Remove a Multicast Filter. |
| Syntax | remove mcast-filter <McastFilterName> * |
| Parameter | |
| McastFilterName (required) | The name of an existing Multicast Filter in the domain. A Multicast Filter named '*' removes all the filters. |
| Example | |

| Item | Description |
|------|---|
| | ->remove mcast-filter Filter1 Removes a Multicast Filter |
| | ->remove mcast-filter * Removes all Multicast Filters |

| Item | Description |
|----------------------------|---|
| set mcast-filter | Modify the Multicast Filter. |
| Syntax | set mcast-filter <McastFilterName> [Name=<NewName>] [Labels=<Label1><Label2>, ...] [Color=<red green blue orange purple>] |
| Parameter | |
| McastFilterName (required) | The name of an existing Multicast Filter to modify |
| Properties | |
| Labels (optional) | Labels assigned to this multicast filter. Labels are used in the GUI to help manage large numbers of filters. Labels can be assigned in the CLI, but are only used in the GUI. A maximum of 16 labels can be assigned. |
| Color (optional) | Color assigned to this multicast filter. Color is used in the GUI to help manage large numbers of filters. A color can be assigned in the CLI, but is only used in the GUI. Allowed colors are red, green, blue, purple, or orange. |
| Name (optional) | The new name of the Multicast filter |
| Examples | |
| | ->set mcast-filter Blue Name=Red Changes the name of an existing Multicast Filter from "Blue" to "Red" |
| | ->set mcast-filter Filter1 Labels="label1, label2" Adds labels to a multicast filter |
| | ->set mcast-filter Filter1 Labels= Removes all labels from a filter |
| | ->set mcast-filter Filter1 Color=red Sets the network color to red |

| Item | Description |
|----------------------------|---|
| show mcast-filter | Display information about the Multicast Filter. |
| Syntax | show mcast-filter <McastFilterName> * |
| Parameter | |
| McastFilterName (optional) | Name of a Multicast Filter existing in the VC domain. "*" displays a detailed view of all the Multicast filters. The default behavior displays a summary output of all Multicast filters. |
| Examples | |
| | ->show mcast-filter Display a summary listing of all Multicast Filters |
| | ->show mcast-filter * Show detailed information for all Multicast Filters |
| | ->show mcast-filter Filter1 Show detailed information for a specific Multicast Filter |

mfs-filter

Manage Multicast Filters in Multicast Filtersets.

Supported actions: help, add, remove

| Item | Description |
|------------------------|---|
| add mfs-filter | Add a Multicast Filter to a Multicast Filterset. |
| Syntax | add mfs-filter FilterSet=<McastFilterSetName> McastFilter=<Name1>[, <Name2>, ...] |
| Properties | |
| FilterSet (required) | The name of an existing Multicast Filterset in the domain |
| McastFilter (required) | The Multicast Filters to be added to the specified Multicast Filterset. This property is a list of existing Multicast Filter names separated by commas. |
| Examples | |
| | ->add mfs-filter FilterSet=mfs1 McastFilter=filter1 Adds a Multicast Filter "filter1" to Filterset "mfs1" |
| | ->add mfs-filter FilterSet=mySet McastFilter=MF1,MF2 Adds Multicast Filters "MF1" and "MF2" to Multicast Filterset "mySet" |

| Item | Description |
|------------------------|---|
| remove mfs-filter | Remove a Multicast Filter from a Multicast Filterset. |
| Syntax | remove mfs-filter FilterSet=<McastFilterSetName> McastFilter=<Name1>[, <Name2>, ...] |
| Properties | |
| FilterSet (required) | The name of an existing Multicast Filterset in the domain. |
| McastFilter (required) | The Multicast Filters to be removed from the specified Multicast Filterset. This property is a list of existing Multicast Filter names separated by commas. |
| Example | |
| | ->remove mfs-filter FilterSet=myFS McastFilter=MF1,MF2 Removes Multicast Filters "MF1" and "MF2" from Multicast Filterset "myFS" |

nag-network

Manage networks associated to network access groups.

Supported actions: add, help, remove, show

| Item | Description |
|---|---|
| add nag-network | Add one or more networks to a network access group. Any network access groups previously configured for the network remain. |
| Syntax | add nag-network Nag=<nagName> Network=<NetName1>[, <NetName2>, ...] <NagNetworkID> |
| Parameter | |
| Nag (required if NagNetworkID is not specified) | The name of an existing network access group |
| Network (required if NagNetwork ID | The name of the networks to be added as members to the network access group, |

| Item | Description |
|-------------------|---|
| is not specified) | separated by commas. Do not use spaces unless they are enclosed in quotation marks. |
| NagNetworkID | The Nag name and Network of interest. The format is <NagName:NetworkName>. If this is specified then the Nag= and Network= parameters are not provided. |
| Examples | |
| | ->add nag-network Nag=DatabaseNetGroup Network=Net1,Net2,Net3 Adds networks Net1, Net2, and Net3 to the DatabaseNetGroup network access group |
| | ->add nag-network nag1:network1 Adds network network1 to the nag1 network access group |

| Item | Description |
|--|---|
| remove nag-network | Removes a network from a network access group. |
| Syntax | remove nag-network <NagNetworkID> Nag=<nagName> Network=<NetName1>[,<NetName2>,...] |
| Parameter | |
| NagNetworkID (required if Nag= Network= is not specified) | The ID of an existing network to network access group association. The ID format is <NagName:NetworkName>. The NagName must be specified if it is the only network access group of which the network is a member. |
| Nag (required if NagNetworkID is not specified) | The name of an existing network access group |
| Network (required if NagNetworkID is not specified) | The name of the network members to be removed from the network access group, separated by commas. Do not use spaces unless enclosed in quotation marks. |
| Examples | |
| | ->remove nag-network DatabaseNetGroup:Net1 -or- ->remove nag-network Nag=DatabaseNetGroup Network=Net1 Removes a specified network from a specified network access group |
| | ->remove nag-network Nag=DatabaseNetGroup Network=Net1,Net2 Removes specified networks from a specified network access group |

| Item | Description |
|----------------------------|---|
| show nag-network | Display the network to network access group association information. |
| Syntax | show nag-network [<NagNetworkID> *] |
| Parameter | |
| NagNetworkID (optional) | The ID of an existing network to network access group association. The ID format is <NagName:NetworkName>. Use "*" to display detailed information for all network to network access group associations in the domain. If not specified, a summary of all network to network access group associations appears. |
| Examples | |
| | ->show nag-network Displays a summary of all network to network access group associations in the domain |
| | ->show nag-network * Displays detailed information for all network to network access group associations in the domain |
| | ->show nag-network DatabaseNetGroup:Net1 Displays detailed information about the association between a specified network access group and a specified network |

name-server

Display a snapshot of all hosts and direct attached storage devices for the specified FlexFabric module.

Supported actions: help, show

| Item | Description |
|------------------------|--|
| show name-server | Display a snapshot of all hosts and direct attached storage devices for the specified FlexFabric module. |
| Syntax | show name-server <ModuleID> |
| Parameter | |
| ModuleID (required) | The ID of the module for which to display the name server information. The module must be a FlexFabric module. The ID is in the format of <EnclosureID>:<BayNumber>. |
| Example | |
| | ->show name-server enc0:1 Displays the name server information for the module in bay 1 of enclosure enc0 |

network-access-group

Manage network access groups.

Supported actions: add, help, remove, set, show

| Item | Description |
|--------------------------|---|
| add network-access-group | Create a new network access group. After the network access group is created, it can be added to a network. The maximum supported number of network access groups is 128. |
| Syntax | add network-access-group <Name> |
| Parameter | |
| Name (required) | The unique name of the new network access group to create. Valid characters include alphanumeric, "_", "-", and ".". The maximum length of the name is 64 characters. |
| Example | |
| | ->add network-access-group DatabaseNetGroup Creates a new network access group, and then adds it to the domain |

| Item | Description |
|-----------------------------|---|
| remove network-access-group | Remove a network access group from the domain. To remove a network access group, it cannot be in use by any server profiles. A network access group cannot be deleted if it is the only one to which a network belongs. The Default network access group cannot be deleted. |
| Syntax | remove network-access-group <Name *> |
| Parameter | |
| Name (required) | The name of an existing network access group in the domain. Use "*" to remove all removable network access groups. |
| Examples | |
| | ->remove network-access-group DatabaseNetGroup Removes a specified network access group |
| | ->remove network-access-group * Removes all removable network access groups |

| Item | Description |
|--------------------------|---|
| set network-access-group | Modify an existing network access group. |
| Syntax | set network-access-group <Name> Name=<NewName> |
| Parameter | |
| Name (required) | The name of an existing network access group to modify |
| Property | |
| Name (required) | The new name of the network access group |
| Example | |
| | ->set network-access-group NetGroup1 Name=NetGroup2 Changes the name of an existing network access group from NetGroup1 to NetGroup2 |

| Item | Description |
|---------------------------|--|
| show network-access-group | Display all network access groups in the domain. |
| Syntax | show network-access-group [<Name> *] |
| Parameter | |
| Name (optional) | The name of an existing network access group in the VC domain. Use "*" to display a detailed view of all the network access groups. If not specified, a summary view of all network access groups appears. |
| Examples | |
| | ->show network-access-group Displays a summary of all network access groups |
| | ->show network-access-group * Displays detailed information for all network access groups |
| | ->show network-access-group DatabaseNetGroup Displays detailed information for a specific network access group |

network-range

Manage multiple networks in a shared uplink set.

Supported actions: add, help, remove, set

| Item | Description |
|----------------------|--|
| add network-range | Create multiple networks in a shared uplink set. |
| Syntax | add network-range [-quiet] UplinkSet=<UplinkSetName> [NamePrefix=<prefix>] [NameSuffix=<suffix>] VLANIds=<VLAN range list> [State=<enabled disabled>] [PrefSpeedType=<auto custom>] [PrefSpeed=<100Mb-20Gb in 100Mb steps>] [MaxSpeedType=<unrestricted custom>] [MaxSpeed=<100Mb-20Gb in 100Mb steps>] [Nags=<Name1>[<Name2>, ...] [SmartLink=<enabled disabled>] [Labels=<Label1>[<Label2>, ...] [Color=<red green blue orange purple>] |
| Options | |
| quiet | This option suppresses user confirmation prompts. This option is useful when scripting operations. |
| Properties | |
| UplinkSet (required) | The name of an existing shared uplink port set to use with the new |

| Item | Description |
|---|---|
| | networks |
| VLANIds (required) | A comma separated list of VLAN ranges. The VLAN IDs must not overlap or already be used in the uplink port set. The VLAN IDS are combined with the NamePrefix and NameSuffix properties (if any) to create the name for the networks. |
| NamePrefix (optional) | The string to prefix before the VLAN ID when naming the new networks. If omitted, no string is used to prefix the VLAN ID. |
| NameSuffix (optional) | The string to add after the VLAN ID when naming the new networks. If omitted, no string is added after the VLAN ID. |
| State (optional) | Enables or disables the networks. Valid values are "Enabled" and "Disabled". The default value is "Enabled". |
| PrefSpeedType (optional) | The default connection speed for any Ethernet connection attached to these networks. Valid values include "Auto" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Auto". |
| PrefSpeed (required if PrefSpeedType is "Custom") | The connection speed for any Ethernet connection attached to these networks. Valid values range from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| MaxSpeedType (Optional) | The maximum connection speed for any Ethernet connection attached to these networks. Valid values include "Unrestricted" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Unrestricted". |
| MaxSpeed (required if MaxSpeedType is "Custom") | The maximum connection speed for any Ethernet connection attached to these networks. Valid values range from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| Nags (optional) | The network access groups to which the networks belong, separated by commas. Do not use spaces unless they are enclosed in quotation marks. If no network access groups are specified, the domain default network access group (Default) is used. |
| SmartLink (optional) | Enables or disables the SmartLink capability for the networks. Valid values include "Enabled" and "Disabled". |
| Labels (optional) | Labels assigned to these networks. Labels are used in the GUI to help with management of large numbers of networks. Labels can be assigned in the CLI, but are only used in the GUI. A maximum of 16 labels can be assigned. |
| Color (optional) | Color assigned to these networks. Color is used in the GUI to help manage large numbers of networks. A color can be assigned in the CLI, but is only used in the GUI. Red, green, blue, purple, or orange are allowed. |
| Examples | |
| | <pre>->add network-range UplinkSet=Alpha NamePrefix=Network NameSuffix=_A VLANIDs=1-100 Creates 100 networks in an existing uplink set</pre> |
| | <pre>->add network-range UplinkSet=Alpha NamePrefix=Network NameSuffix=_A VLANIDs=101-110,115-119,130,4094,700-703 Creates non-contiguous networks in an existing uplink set</pre> |
| Item | Description |
| remove network-range | Remove multiple networks from a shared uplink set. |
| Syntax | <pre>remove network-range [-quiet] UplinkSet=<UplinkSetName> VLANIds=<VLAN range list></pre> |

| Item | Description |
|----------------------|--|
| Options | |
| quiet | Suppresses user confirmation prompts during network range removal. This option is used mainly in automated scripting scenarios. |
| Properties | |
| UplinkSet (required) | The name of the shared uplink set from which the networks are being removed |
| VLANIds (required) | The list of VLAN IDs (comma separated list of VLAN ID ranges) to be deleted from the shared uplink set. For this command, the shared uplink set and list of VLAN IDs identify the networks to be deleted, not the network names. |
| Example | |
| | <pre>->remove network-range UplinkSet=Alpha VLANIDs=1-10,15,21-30</pre> Removes networks from an existing uplink set |

| Item | Description |
|---|--|
| set network-range | Change the configuration of multiple networks in a shared uplink set. |
| Syntax | <pre>set network-range [-quiet] UplinkSet=<UplinkSetName> VLANIds=<VLAN range list> [State=<enabled disabled>] [PrefSpeedType=<auto custom>] [PrefSpeed=<100Mb-20Gb in 100Mb steps>] [MaxSpeedType=<unrestricted custom>] [MaxSpeed=<100Mb-20Gb in 100Mb steps>] [Nags=<Name1>[<Name2>,...] [SmartLink=<enabled disabled>] [Labels=<Label1>[<Label2>,...] [Color=<red green blue orange purple>]</pre> |
| Options | |
| quiet | This option suppresses user confirmation prompts and is useful when scripting operations. |
| Properties | |
| UplinkSet (required) | The name of an existing shared uplink port set to use with the networks |
| VLANIds (required) | A comma separated list of VLAN ranges that identify the networks in the shared uplink port set being modified |
| State (optional) | Enables or disables the networks. Valid values are "Enabled" and "Disabled". The default value is "Enabled". |
| PrefSpeedType (optional) | The default connection speed for any Ethernet connection attached to these networks. Valid values include "Auto" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Auto". |
| PrefSpeed (required if PrefSpeedType is "Custom") | The connection speed for any Ethernet connection attached to these networks. Valid values range from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| MaxSpeedType (Optional) | The maximum connection speed for any Ethernet connection attached to these networks. Valid values include "Unrestricted" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Unrestricted". |
| MaxSpeed (required if MaxSpeedType is "Custom") | The maximum connection speed for any Ethernet connection attached to these networks. Valid values range from 100Mb to the MAX configured speed for the network in 100Mb increments. |

| Item | Description |
|----------------------|--|
| Nags (optional) | The network access groups to which the networks belong, separated by commas. Do not use spaces unless they are enclosed in quotation marks. If nags is not specified, the network access groups are not changed. |
| SmartLink (optional) | Enables or disables the SmartLink capability for the networks. Valid values include "Enabled" and "Disabled". |
| Labels (optional) | Labels assigned to these networks. Labels are used in the GUI to help with management of large numbers of networks. Labels can be assigned in the CLI, but are only used in the GUI. A maximum of 16 labels can be assigned. |
| Color (optional) | Color assigned to these networks. Color is used in the GUI to manage large numbers of networks. A color can be assigned in the CLI, but is only used in the GUI. Red, green, blue, purple, or orange are allowed. |
| Example | |
| | <pre>->set network-range UplinkSet=Alpha VLANIDs=1-10,21-30 SmartLink=Enabled</pre> Changes the SmartLink setting for multiple networks |

network

Manage Virtual Connect Ethernet networks.

Supported actions: add, help, remove, set, show

| Item | Description |
|------------------------|--|
| add network | <p>Create a new Ethernet or FCoE network. An FCoE network is associated to an uplink port set. After the network is created, uplink ports can be added if the network is not using a shared uplink set.</p> <p>The SmartLink property is no longer supported during the creation of the network. If specified, it is ignored. To configure the SmartLink attribute, use the <code>set network</code> command.</p> <p>If the QoS type is set to "CustomNoFcoe", a "cannot add fabric when QoS configuration type is CustomNoFCoE" error message appears. For more information about setting the QoS type, see "qos (on page 97)."</p> |
| Syntax | <pre>add network <NetworkName> [-quiet][-fcoe] [Nags=<nagName>[,<nagName2>,...]] [UplinkSet=<UplinkSetName> VlanID=<VlanID>] [State=<Enabled Disabled>] [NativeVLAN=<Enabled Disabled>] [Private=<Enabled Disabled>] [ConnectionMode=<Auto Failover>] [VlanTunnel=<Enabled Disabled>] [PrefSpeedType=<Auto Custom>] [PrefSpeed=<100Mb-20Gb in 100Mb increments>] [MaxSpeedType=<UnRestricted Custom>] [MaxSpeed=<100Mb-20Gb in 100Mb increments>] [LacpTimer=<Domain-Default Short Long>] [Labels=<Label1>[<Label2>,...]] [Color=<red green blue orange purple>]</pre> |
| Parameter | |
| NetworkName (required) | The unique name of the new network to create. Valid characters include alphanumeric, "_", and ".". The maximum length of the name is 64 characters. |
| Options | |
| Quiet | Suppresses user confirmation prompts during network creation and modification. This option is used mainly in automated scripting scenarios. |
| fcoe | Specifies an FCoE network. 32 FCoE networks can be added per uplink set. |

| Item | Description |
|---|--|
| Properties | |
| Nags (optional) | The names of the existing network access groups of which this network is a member, separated by commas. Do not use spaces unless they are enclosed in quotation marks. If no network access groups are specified, the domain default network access group (Default) is used. This property is not allowed for an FCoE network. |
| UplinkSet (optional) | The name of an existing shared uplink set to use with this network. If this property is specified, a valid VLAN ID must also be provided. The limit is 32 networks per shared uplink set. This property is required for an FCoE network. |
| VlanID (optional) | The VLAN ID associated with the network (used with the shared uplink set only). The VLAN ID is a valid number between 1 and 4094. This property is required for an FCoE network. |
| State (optional) | Enables or disables the network. Valid values are "Enabled" and "Disabled". The default value is "Enabled". |
| NativeVLAN (optional) | Enables or disables the network to act as a native VLAN. Valid values are "Enabled" and "Disabled". The default value is "Disabled". This property can be specified only if the network is a shared Ethernet network. |
| Private (optional) | Enables or disables the network to act as a private network. Valid values are "Enabled" and "Disabled". The default value is "Disabled". This property is not allowed for an FCoE network. |
| ConnectionMode (optional) | Specifies the connection type that is formed when multiple ports are added to the network. Valid values include "Auto" and "Failover". The default value is "Auto". |
| VlanTunnel (optional) | Enables or disables VLAN tag tunneling. If enabled, VLAN tags are passed through the domain without any modification. If disabled, all tagged frames are discarded. This property is not allowed for an FCoE network. If multiple networks are configured on any server port, this option cannot be modified. |
| PrefSpeedType (optional) | The default connection speed for any Ethernet connection attached to this network. Valid values include "Auto" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Auto". |
| PrefSpeed (required if PrefSpeedType is "Custom") | The connection speed for any Ethernet connection attached to this network. Valid values range from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| MaxSpeedType (Optional) | The maximum connection speed for any Ethernet connection attached to this network. Valid values include "Unrestricted" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Unrestricted". |
| MaxSpeed (required if MaxSpeedType is "Custom") | The maximum connection speed for any Ethernet connection attached to this network. Valid values range from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| LacpTimer (optional) | Specifies the network LACP timer. Valid values are "Domain-Default", "Short", and "Long". This property can be specified only if the network is not a network associated with a Shared Uplink Set, or the ConnectionMode property value is "Auto". The default value is "Short". |
| Labels (optional) | Labels assigned to this network. Labels are used in the GUI to help manage large numbers of networks. Labels can be assigned in the CLI, but are only used in the GUI. A maximum of 16 labels can be assigned. |
| Color (optional) | Color assigned to this network. Color is used in the GUI to help manage large numbers of networks. A color can be assigned in the CLI, but is only used in the GUI. Red, green, blue, purple, or orange are allowed. |
| Examples | |
| | ->add network MyNewNetwork Creates a new network, and then adds it to the domain as a member of the Default |

| Item | Description |
|------|--|
| | network access group |
| | ->add network Network1 nags=DatabaseNetGroup,AccessNetGroup Creates a network named Network1 and assigns it to network access groups DatabaseNetGroup and AccessNetGroup |
| | ->add network MyNewNetwork2 UplinkSet=MyUplinkSet VlanID=145 Creates a new network and uses a shared uplink port set |
| | ->add network FcoeNetwork -fcoe UplinkSet=MyUplinkSet VlanID=100 Creates a new FCoE network |
| | ->add network Network1 Private=Enabled Configures a private network when adding a new network |
| | ->add network Network1 UplinkSet=Uplinkset1 VLANID=100 NativeVLAN=Enabled Creates a new network with a shared uplinkset and tags it as Native VLAN |
| | ->add network Network1 ConnectionMode=Failover Creates a new network and sets the connection mode as failover |
| | ->add network Network1 VlanTunnel=Enabled Creates a new network and enables VLAN tunneling |
| | ->add network Network1 PrefSpeedType=Custom PrefSpeed=4000 MaxSpeedType=Custom MaxSpeed=6000 Creates a new network with a preferred connection speed of 4Gb and a maximum connection speed of 6Gb |
| | ->add network Network1 ConnectionMode=Auto LacpTimer=Domain-Default Creates a new network using the domain default LACP timer |
| | ->add network Network1 Labels="label1, label2" Creates a new network with labels label1 and label2 |
| | ->add network Network1 Color=red Creates a new network with the color red |

| Item | Description |
|------------------------|--|
| remove network | Remove a network from the domain. To remove a network, it cannot be in use by any server profiles. |
| Syntax | remove network <NetworkName *> |
| Parameter | |
| NetworkName (required) | The name of an existing network in the domain. Use "*" to remove all networks. |
| Examples | |
| | ->remove network MyNetwork Removes a specified network |
| | ->remove network * Removes all networks |

| Item | Description |
|---------------|--|
| set network | Modify an existing Ethernet or FCoE network. |
| Syntax | set network <NetworkName> [-quiet] [State=<Enabled Disabled>] [SmartLink=<Enabled Disabled>] [NativeVLAN=<Enabled Disabled>] [Private=<Enabled Disabled>] [Nags=<nagName>[,<nagName2>,...]] [Name=<NewName>] [VlanId=<New VlanId>] [ConnectionMode=<Auto Failover>] [VlanTunnel=<Enabled Disabled>] [PrefSpeedType=<Auto Custom>] [PrefSpeed=<100Mb-20Gb in 100Mb increments>] [MaxSpeedType=<UnRestricted Custom>] [MaxSpeed=<100Mb-20Gb in |

| Item | Description |
|--|---|
| | 100Mb increments>] [LacpTimer=<Domain-Default Short Long>] [Labels=<Label1> [<Label2>, ...] [Color=<red green blue orange purple>] |
| Parameter | |
| NetworkName (required) | The name of an existing network to modify |
| Option | |
| Quiet (optional) | Suppresses user confirmation prompts during network creation and modification. This option is used mainly in automated scripting scenarios. |
| Properties | |
| Name (optional) | The new name of the network |
| State (optional) | Enables or disables the network. Valid values are "Enabled" and "Disabled". |
| SmartLink (optional) | Enables or disables the SmartLink capability for a network. Valid values include "Enabled" and "Disabled". This property is not allowed for an FCoE network. SmartLink cannot be modified unless one or more ports are added to the network. |
| NativeVLAN (optional) | Enables or disables the network to act as a native VLAN. Valid values are "Enabled" and "Disabled". The default value is "Disabled". This property can be configured only if it is applied to a shared Ethernet network. |
| Private (optional) | Enables or disables the network to act as a private network. Valid values are "Enabled" and "Disabled". The default value is "Disabled". This property is not allowed for an FCoE network. |
| Nags (optional) | Modifies the network access groups of which this network is a member. The specified network access groups replace the original network access groups. If no network access groups are specified, the network access groups are not changed. |
| VlanID (optional) | Modifies the VLAN ID of the network if it belongs to a shared uplink set that has not been configured |
| ConnectionMode (optional) | Specifies the connection type that is formed when multiple ports are added to the network. Valid values include "Auto" and "Failover". The default value is "Auto". This property is not allowed for an FCoE network. |
| VlanTunnel (optional) | Enables or disables VLAN tag tunneling. Valid values are "Enabled" and "Disabled". If enabled, VLAN tags are passed through the domain without any modification. If disabled, all tagged frames are discarded. This property is not allowed for an FCoE network. If multiple networks are configured on any server port, this option cannot be modified. |
| PrefSpeedType (Optional) | The default connection speed for any Ethernet connection attached to this network. Valid values include "Auto" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Auto". |
| PrefSpeed (Required if PrefSpeedType is "Custom") | The connection speed for any Ethernet connection attached to this network. Valid values range from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| MaxSpeedType (Optional) | The maximum connection speed for any Ethernet connection attached to this network. Valid values include "Unrestricted" and "Custom". "Custom" enables you to configure the preferred speed. The default value is "Unrestricted". |
| MaxSpeed (required if MaxSpeedType is "Custom") | The maximum connection speed for any Ethernet connection attached to this network. Valid values range from 100Mb to the MAX configured speed for the network in 100Mb increments. |
| LacpTimer (optional) | Specifies the network LACP timer. Valid values are "Domain-Default", "Short", and "Long". This property can be specified only if the network is not a network associated with a Shared Uplink Set, or the ConnectionMode property value is "Auto". The default |

| Item | Description |
|-------------------|---|
| | value is "Short". |
| Nags (optional) | The Network Access Group(s) the network belongs to. The default is Default Network Access Group, a list of Network Access Group names separated by comma. The Network Access Groups should be in quotation marks if there are spaces in the list. This property is not allowed for an FCoE network. |
| Labels (optional) | Labels assigned to the network. Labels are used in the GUI to help manage large numbers of networks. Labels can be assigned in the CLI, but are only used in the GUI. A maximum of 16 labels can be assigned. To remove all labels from a network, specify Labels= |
| Color (optional) | Color assigned to this network. Color is used in the GUI to help manage large numbers of networks. A color can be assigned in the CLI, but is only used in the GUI. Red, green, blue, purple, or orange are allowed. To remove the color from a network, specify Color= |
| Examples | |
| | ->set network MyNetwork State=Disabled Disables an existing network named MyNetwork |
| | ->set network Blue Name=Red Changes the name of an existing network from Blue to Red |
| | ->set network GreenNetwork SmartLink=Enabled Enables the SmartLink feature on the specified network |
| | ->set network network1 NativeVLAN=Disabled Disables the network native VLAN tagging |
| | ->set network network1 Private=Disabled Disables the private network property |
| | ->set network Network1 Private=Enabled Enables a private network |
| | ->set network Network1 Nags=NetworkGroup2,NetworkGroup3 Changes the network access groups for Network1 to network access groups NetworkGroup2 and NetworkGroup3 (previous network access groups are removed) |
| | ->set network Network1 VlanId=150 Changes the VLAN ID of a network associated with a shared uplink set |
| | ->set network Network1 VlanTunnel=Enabled Enables VLAN tunneling on the network |
| | ->set network Network1 PrefSpeedType=Custom PrefSpeed=4000 MaxSpeedType=Custom MaxSpeed=6000 Modifies the network to a preferred connection speed of 4Gb and a maximum connection speed of 6Gb |
| | ->set network Network1 ConnectionMode=Auto LacpTimer=Domain-Default Modifies the network to use the domain default LACP timer |
| | ->set network Network1 Labels="label1, label2" Adds labels to a network |
| | ->set network Network1 Labels= Removes all labels from a network |
| | ->set network Network1 Color=red Sets the network color to red |
| Item | Description |
| show network | Display all Ethernet networks in the domain. Configured values for ConnectionMode and VlanTunnel display for UNSHARED networks only. Configured values for NativeVLAN, UplinkSet, and VlanID display for SHARED |

| Item | Description |
|------------------------|--|
| | networks only. |
| Syntax | show network [<NetworkName> *] |
| Parameter | |
| NetworkName (optional) | The name of an existing network (Ethernet or FCoE) in the VC domain. Use "*" to display a detailed view of all the networks. If not specified, a summary view of the networks appears. |
| Examples | |
| | ->show network Displays a summary of all networks |
| | ->show network * Displays detailed information for all networks |
| | ->show network MyNetwork Displays detailed information for a specific network |

port-monitor

Manage port monitor configuration.

Supported actions: help, add, remove, set, show

| Item | Description |
|-------------------------|--|
| add port monitor | Add a new network analyzer port and other ports to be monitored. |
| Syntax | add port-monitor [AnalyzerPort=<PortID>] [Speed=<Auto 10Mb 100Mb 1Gb 10Gb 40Gb Disabled>] [Duplex=<Auto Half Full>] [MonitorPort=<PortID>] [Direction=<ToServer FromServer Both>] |
| Properties | |
| AnalyzerPort (optional) | The uplink port that is used for monitoring network traffic. Only one port can be configured as the analyzer port. After a port is allocated to port monitoring, it is not available for use in VC networks and shared uplink sets. The format of the network analyzer port is <EnclosureID>:<InterconnectBay>:<PortNumber>. For QSFP+ ports, the <PortNumber> format is Q<x>.<y>. If the EnclosureID is not specified, the default enclosure is the local enclosure where the domain resides. |
| Speed (optional) | The port speed for the network analyzer port. Valid values include "Auto", "10Mb", "100Mb", "1Gb", "10Gb", "40Gb", and "Disabled". The default value is "Auto". If there is no connector present on the analyzer port, only "Auto" and "Disabled" can be configured as the port speed. Speed restrictions apply. |
| Duplex (optional) | The duplex mode of the network analyzer port. Valid values include "Auto", "Half", and "Full". The default value is "Auto". |
| MonitorPort (optional) | The server port to be monitored. The format of the monitored port is <EnclosureID>:<DeviceBay>:<PortNumber>. If the enclosure ID is not specified, the default enclosure is the local enclosure. The ID for the monitor port can be referenced from the ID column in the output of the show server-port command. |
| Direction (optional) | The direction of network traffic on the port being monitored. Valid values include "ToServer", "FromServer", and "Both". |

| Item | Description |
|----------------|--|
| Example | |
| | ->add port-monitor AnalyzerPort=enc0:1:4 Speed=1Gb Duplex=full MonitorPort=enc0:5:4 Direction=FromServer Adds a new network analyzer port and a server port to be monitored |
| | ->add port-monitor AnalyzerPort=enc0:1:Q1.1 Speed=Auto Duplex=full Adds a new QSFP+ network analyzer port |
| | ->add port-monitor AnalyzerPort=enc0:1:Q1.1 Speed=40Gb Duplex=full Adds a QSFP+ network analyzer uplink port with a speed of 40Gb |

| Item | Description |
|---------------------|--|
| remove port-monitor | Remove ports from a port monitor configuration. Removing the network analyzer port automatically disables port monitoring. |
| Syntax | remove port-monitor AnalyzerPort=<PortID *> MonitorPort=<PortID *> |
| Properties | |
| AnalyzerPort | The network analyzer port to be removed. Use "*" to remove all network analyzer ports from the configuration. |
| MonitorPort | The monitor port to be removed. Use "*" to remove all monitor ports from the port monitor configuration. |
| Examples | |
| | ->remove port-monitor AnalyzerPort=enc0:3:1 Removes the network analyzer port from the configuration |
| | ->remove port-monitor AnalyzerPort=enc0:1:Q2.1 Removes the QSFP+ network analyzer port from the configuration |
| | ->remove port-monitor AnalyzerPort=* Removes all network analyzer ports from the configuration |
| | ->remove port-monitor monitorPort=enc0:1:1 Removes a specific server port from the monitored port list |
| | ->remove port-monitor monitorPort=* Removes all monitored ports |

| Item | Description |
|-------------------------|---|
| set port-monitor | Modify an existing port monitor configuration. |
| Syntax | set port-monitor [Enabled=<true false>] [AnalyzerPort=<PortID>] [Speed=<Auto 10Mb 100Mb 1Gb 10Gb 40Gb Disabled>] [Duplex=<Auto Half Full>] [MonitorPort=<PortID>] [Direction=<ToServer FromServer Both>] |
| Properties | |
| Enabled (optional) | Enables or disables port monitoring. The network analyzer port must be configured properly before port monitoring can be enabled. |
| AnalyzerPort (optional) | The uplink port used for monitoring network traffic. The format of the network analyzer port is <EnclosureID>:<InterconnectBay>:<PortNumber>. For QSFP+ ports, the <PortNumber> format is Q<x>.<y>. If the enclosure ID is not specified, the default enclosure is the local enclosure. |
| Speed (optional) | The port speed for the network analyzer port. Valid values include "Auto", "10Mb", "100Mb", "1Gb", "10Gb", "40Gb", and "Disabled". The default value is "Auto". |

| Item | Description |
|--|--|
| | If there is no connector present on the analyzer port, only "Auto" and "Disabled" can be configured as the port speed. Speed restrictions apply. |
| Duplex (optional) | The port duplex mode of the network analyzer port. Valid values include "Auto", "Half", and "Full". The default value is "Auto". |
| MonitorPort (required if the Direction property is being modified) | The server port to be monitored. The format of the monitored port is <EnclosureID>:<DeviceBay>:<PortNumber>. If the EnclosureID is not specified, the default enclosure is the local enclosure where the domain resides. |
| Direction (optional) | The direction of network traffic on the port being monitored. Valid values include "ToServer", "FromServer", and "Both". |
| Examples | |
| | ->set port-monitor AnalyzerPort=enc0:3:1 Speed=1Gb Duplex=half Modifies network analyzer uplink port properties |
| | ->set port-monitor MonitorPort=enc0:1:6 Direction=ToServer Modifies a monitored server port |
| | ->set port-monitor Enabled=true Enables port monitoring |
| | ->set port-monitor Enabled=false Disables port monitoring |
| | ->set port-monitor AnalyzerPort=enc0:1:Q1.1 Speed=Auto Duplex=full Modifies network analyzer uplink port properties for a QSFP+ uplink port |
| | ->set port-monitor AnalyzerPort=enc0:1:Q1.1 Speed=40Gb Duplex=full Modifies network analyzer uplink port properties for a QSFP+ uplink port to a speed of 40Gb |

| Item | Description |
|-------------------|--|
| show port-monitor | Display the Virtual Connect port monitor configuration. |
| Syntax | show port-monitor |
| Example | |
| | ->show port-monitor Displays the port monitor configuration |

port-protect

Monitor the server downlink ports for the pause flood condition or network loop condition and take protective action by disabling the port.

For information about port-protect settings, see "Configuring network loop protection settings (on page 192)."

Supported actions: help, reset, set, show

| Item | Description |
|--------------------|---|
| reset port-protect | Reset and restart all ports that are currently disabled due to the protection action. |
| Syntax | reset port-protect |
| Example | |
| | ->reset port-protect |

| Item | Description |
|------|--|
| | Resets the port-protection state on all ports currently disabled due to the port protection action |

| Item | Description |
|------------------------|--|
| set port-protect | Modify the domain wide configuration for port protection against the following denial of service conditions: <ul style="list-style-type: none"> • Network loop protection for server downlink ports • Pause flood protection for downlink physical ports |
| Syntax | set port-protect [-quiet] [networkLoop=<Enabled Disabled>] [pauseFlood=<Enabled Disabled>] |
| Option | |
| quiet (optional) | Suppresses user confirmation prompts. This option is useful when scripting operations. |
| Properties | |
| networkLoop (required) | Enables/disables downlink network loop detection and protection. Valid values are "Enabled" and "Disabled". |
| pauseFlood (required) | Enables/disables pause flood detection and protection. Valid values are "Enabled" and "Disabled". |
| Example | |
| | ->set port-protect networkLoop=Enabled PauseFlood=Enabled Sets the global option to enable the loop protection and pause flood protection |

| Item | Description |
|-------------------|--|
| show port-protect | Display the loop protection and pause flood protection. |
| Syntax | show port-protect |
| Example | |
| | ->show port-protect Displays the loop protection and pause flood protection |

profile

Manage server profiles.

NOTE: For information on nPartitions and assigning a VC profile to an nPar, see the *HP Virtual Connect for c-Class BladeSystem User Guide* on the HP website (<http://www.hp.com/go/vc/manuals>).

Supported actions: add, assign, copy, help, load, remove, save, set, show, unassign

| Item | Description |
|---------------|--|
| add profile | Create a new server profile. After the profile is created, configure the profile using the "set" subcommand and add additional network, fabric, and FCoE connections. The server profile can be assigned to a device bay using the "assign" subcommand. Profiles are created without FCoE connections if the QoS type is set to "CustomNoFcoe". For more information about setting the QoS type, see "qos (on page 97)." |
| Syntax | add profile <ProfileName> [-NoDefaultEnetConn] [-NoDefaultFcConn] [-NoDefaultFcoeConn] [Nag=<nagName>] |

| Item | Description |
|---|--|
| | [HideUnusedFlexNICs=<true false>] [SNTYPE=<Factory-Default User-Defined Pool-Specified>] [SerialNumber=<serialnumber>] [UUID=<uuid>] [bootMode=<Auto Legacy UEFI>] |
| Parameter | |
| ProfileName | The unique name of the new server profile to create |
| Options | |
| NoDefaultEnetConn | Do not add default Ethernet network connections when creating the server profile. |
| NoDefaultFcConn | Do not add default FC SAN connections when creating the server profile. |
| NoDefaultFcoeConn | Do not add default FCoE SAN connections when creating the server profile. |
| Properties | |
| Nag (optional) | Network access group for the profile. The default is the domain default network access group. |
| HideUnusedFlexNICs (optional) | When set to "false," all physical functions of the FlexNICs are enumerated in the operating system as network interfaces. This includes FlexNICs not mapped to profile connections. Enumerating unmapped network interfaces might consume shared resources, even though the interfaces are unused. The default is "true." |
| SNTYPE (optional) | The source of the serial number assignment used during the profile creation. If not specified, the serial number is assigned according to the VC default domain settings. Values include "Factory-Default", "User-Defined", and "Pool-Specified". To use the "Pool-Specified" option, the domain level pool must be set to VC-Defined or User-Defined. Any "Pool-Specified" serial number must come from the currently selected VC-defined or user-defined serial number pool. |
| SerialNumber (required if the SNTYPE is User-Defined or Pool-Specified) | A custom user-defined serial number associated with the server profile. When the profile is assigned to a device bay containing a server, the server inherits the virtual serial number. The user-defined serial number must start with the pattern VCX01. |
| UUID (optional) | A unique 128-bit identifier for the virtual server ID. The format is xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx, where x is any alphanumeric character. If no UUID is specified, one is auto-generated. The UUID can be specified only if the SNTYPE is "User-Defined". |
| bootMode (optional) | Configures the boot mode. The default value is 'Auto'. Valid values are: <ul style="list-style-type: none"> • Auto—Default boot option • Legacy—Legacy BIOS • UEFI—Unified Extensible Firmware Interface Verify the server supports UEFI before configuring the boot mode. |
| Examples | |
| | ->add profile MyNewProfile Creates a new profile and adds it to the domain, using default connections and VC default serial numbers |
| | ->add profile MyNewProfile2 -NoDefaultEnetConn Creates a new profile without adding default Ethernet connections |
| | ->add profile MyNewProfile2 -NoDefaultFcConn Creates a new profile without adding default FC connections |
| | ->add profile MyNewProfile2 -NoDefaultFcoeConn Creates a new profile without adding default FCoE connections |
| | ->add profile MyNewProfile2 -NoDefaultEnetConn -NoDefaultFcConn Creates a new profile without adding default Ethernet and FC connections |
| | ->add profile MyNewProfile2 -NoDefaultEnetConn -NoDefaultFcConn -NoDefaultFcoeConn |

| Item | Description |
|------|---|
| | Creates a new profile without adding default Ethernet, FC, and FCoE connections |
| | ->add profile MyNewProfile2 Nag=DatabaseNetGroup Creates a new profile and associates it with the DatabaseNetGroup network access group |
| | ->add profile MyNewProfile2 HideUnusedFlexNICs=true Does not enumerate FlexNICs not assigned to a profile as network interfaces in the operating system |
| | ->add profile MyNewProfile SNTYPE=User-Defined SerialNumber=VCX0113121 Creates a new profile and specifies a custom virtual serial number |
| | ->add profile MyNewProfile SNTYPE=Pool-Specified SerialNumber=VCX0113121 Creates a new profile and specifies an address from the VC-defined or user-defined pool |
| | ->add profile MyNewProfile SNTYPE=Factory-Default Creates a new profile and uses the factory assigned serial number |
| | ->add profile MyNewProfile SNTYPE=User-Defined SerialNumber=VCX0113121 UUID=15713c60-fcf2-11dc-a656-0002a5d5c51b Creates a new profile and specifies a custom virtual serial number and UUID |

| Item | Description |
|------------------------|---|
| assign profile | Assign a server profile to a device bay. |
| Syntax | assign profile <ProfileName> <DeviceBay> [-PowerOn] |
| Parameters | |
| ProfileName (required) | The unique name of the server profile |
| DeviceBay (required) | The device bay to assign the profile. Format: <EnclosureID>:<DeviceBayNumber>. If EnclosureID is not specified, the default is the local enclosure. To assign a profile to a multi-blade server, <DeviceBay> must be the monarch bay. |
| Option | |
| PowerOn | Powers on the server after the profile is assigned |
| Examples | |
| | ->assign profile MyProfile1 enc0:1 Assigns a profile to device bay 1 of the primary enclosure |
| | ->assign profile MyProfile1 enc0:5 Assigns a profile to a multi-blade server in bays 5-8 of the primary enclosure |

| Item | Description |
|------------------------------|---|
| copy profile | Copy an existing profile configuration to another profile. The copied profile (destination profile) is left unassigned. |
| Syntax | copy profile <src_profile_name> <dest_profile_name> |
| Parameter | |
| src_profile_name (required) | The name of the profile from which the configuration is being copied |
| dest_profile_name (required) | The name of the profile to which the configuration is being copied |
| Example | |
| | ->copy profile_server1 profile_server_new Copies the configuration from profile_server1 to profile_server_new |

| Item | Description |
|------------------------|--|
| load profile | Load a saved EFI data object from a remote ftp server on the network. The EFI data object is loaded into an existing server profile. The server profile must not be assigned to a server bay and it must not have an EFI data object present. |
| Syntax | load profile <ProfileName> address=<ftp://user:password@ipaddress/filename> -or- load profile <ProfileName> address=<ftp://user:password@ipaddress> filename=<name> |
| Parameter | |
| ProfileName (required) | An existing and unassigned profile with no EFI data |
| Properties | |
| address (required) | A valid IPv4 or IPv6 address or host name of the FTP or SFTP server, including user name and password. When the domain is in FIPS mode, SFTP must be used. |
| filename (required) | The name of the file on the FTP or SFTP server where EFI data is loaded. The filename can be mentioned separately. The file path given is treated as relative to the login directory for the user on the FTP server. The user should ensure that the permissions are appropriate for the transfer to succeed. |
| Examples | |
| | ->load profile Profile_1 address=ftp://user:password@192.168.10.12/new-profile-data Loads a saved profile EFI data object file from a remote server |
| | ->load profile Profile_1 address=ftp://user:password@192.168.10.12 filename=/new-profile-data Loads a saved profile EFI data object file from a remote server |
| | ->load profile Profile1 address=ftp://user:password@[2001::1]/new-profile-data Loads a saved profile EFI data object file from a remote server using an IPv6 address |
| | ->load profile Profile1 address=ftp://user:password@[2001::1] filename=/new-profile-data Loads a saved profile EFI data object file from a remote server using an IPv6 address |

| Item | Description |
|------------------------|--|
| remove profile | Remove one or more server profiles from the domain. |
| Syntax | remove profile <ProfileName *> |
| Parameter | |
| ProfileName (required) | The name of an existing profile in the VC domain. Use "*" to remove all existing profiles. |
| Examples | |
| | ->remove profile MyProfile Removes a server profile by name |
| | ->remove profile * Removes all server profiles |

| Item | Description |
|--------------|--|
| save profile | Save an EFI data object from an existing server profile. The server profile must not |

| Item | Description |
|------------------------|--|
| | be assigned to a server bay. |
| Syntax | <pre>save profile <ProfileName> address=<ftp://user:password@ipaddress/filename> -or- save profile <ProfileName> address=<ftp://user:password@ipaddress> filename=<name></pre> |
| Parameter | |
| ProfileName (required) | An existing and unassigned profile in the domain |
| Properties | |
| address (required) | A valid IP address, with username, password, and the name of the EFI data file that will be stored on the FTP or SFTP server. When the domain is in FIPS mode, SFTP must be used. |
| filename (required) | The name of the EFI data file that will be stored on the FTP or SFTP server. The filename can be mentioned separately. The file path is treated as relative to the login directory for the user on the FTP server. The user should ensure that the permissions are appropriate for the transfer to succeed. |
| Examples | |
| | <pre>->save profile Profile_1 address=ftp://user:password@192.168.10.12/new-profile-data</pre> Transfers a profile EFI data object file to a remote server |
| | <pre>->save profile Profile_1 address=ftp://user:password@192.168.10.12 filename=/new-profile-data</pre> Transfers a profile EFI data object file to a remote server |
| | <pre>->save profile Profile1 address=ftp://user:password@[2001::1]/new-profile-data</pre> Transfers a profile EFI data object file to a remote server using an IPv6 address |
| | <pre>->save profile Profile1 address=ftp://user:password@[2001::1] filename=/new-profile-data</pre> Transfers a profile EFI data object file to a remote server using an IPv6 address |

| Item | Description |
|-------------------------------|---|
| set profile | Modify properties of an existing server profile. |
| Syntax | <pre>set profile <ProfileName> [Name=<NewName>] [EFIState=absent] [HideUnusedFlexNICs=<true false>] [Nag=<nagName>] [bootMode=<Auto Legacy UEFI>]</pre> |
| Parameter | |
| ProfileName (required) | The current name of the profile to modify |
| Properties | |
| Name (required) | The new name of the server profile |
| EFIState (required) | Specifies the presence or absence of EFI state information |
| HideUnusedFlexNICs (optional) | <p>When set to "false," the operating system enumerates all physical functions of the FlexNICs as network interfaces, including FlexNICs not mapped to profile connections. Enumerating unmapped network interfaces might consume shared resources, even though the interfaces are unused.</p> <p>When set to "true," the operating system does not enumerate physical functions of FlexNICs not mapped to profile connections as network interfaces. This might change the order of network interfaces in the operating system and require manual adjustments to NIC teaming or other network configurations in the operating system</p> |

| Item | Description |
|---------------------|--|
| | to restore network connectivity. Changing this option requires you to power off the server. |
| Nag (optional) | The new network access group for the server profile. If not specified, the profile's network access group is not changed. |
| bootMode (optional) | Configures the boot mode. Valid values are: <ul style="list-style-type: none"> • Auto—Default boot option • Legacy—Legacy BIOS • UEFI—Unified Extensible Firmware Interface Verify the server supports UEFI before configuring the boot mode. |
| Examples | |
| | ->set profile MyProfile Name=MyNewProfileName Changes the name of a server profile |
| | ->set profile Profile1 EFIState=absent Removes EFI partition block information from a profile |
| | ->set profile Profile1 HideUnusedFlexNICs=true Does not enumerate FlexNICs not assigned to a profile as network interfaces in the operating system |
| | ->set profile Profile1 Nag=NetGroup1 Changes the profile's network access group to NetGroup1 |

| Item | Description |
|------------------------|---|
| show profile | Display all server profiles that exist in the domain and a summary of the associated Ethernet, iSCSI, FC, and FCoE connections. To view detailed information for the connections, use the show enet-connection, show iscsi-connection, show fc-connection, or show fcoe-connection commands. |
| Syntax | show profile [<ProfileName> *] |
| Parameter | |
| ProfileName (optional) | The name of an existing profile in the VC domain. Use "*" to display all existing profiles. If not specified, a summary of all profiles appears. |
| Examples | |
| | ->show profile Displays a summary of all server profiles |
| | ->show profile * Displays detailed information for all profiles |
| | ->show profile MyProfile Displays detailed information for a specific profile |

| Item | Description |
|------------------------|---|
| unassign profile | Unassign a server profile from a device bay. |
| Syntax | unassign profile <ProfileName> |
| Parameter | |
| ProfileName (required) | The name of a server profile currently assigned to a device bay |
| Example | ->unassign profile MyProfile1 Unassigns a server profile from a device bay |

qos-class

Manage the class of the active QoS configuration.

Supported actions: help, set, show

| Item | Description |
|------------------------|---|
| set qos-class | Modify a class of the active QoS configuration |
| Syntax | set qos-class <ClassName> [Name=NewClassName] [Enabled=<True False>] [RealTime=<True False>] [Share=<1-99>] [MaxShare=<1-100>] [EgressDOT1P=<1,2,3,4,5,6,7>] |
| Parameter | |
| ClassName (required) | The name of an existing traffic class |
| Properties | |
| Name (optional) | The new name of the class. The name can be 1-64 characters in length, with alphanumeric and "_", ".", "-". The names of the system classes, Best_Effort, and FCoE_Lossless cannot be modified. |
| Enabled (optional) | Enables or disables the class. Valid values are "True" and "False". If the class becomes disabled, the share is given to the Best_Effort class. An enabled class cannot be disabled if it is currently used by an active classification map. A system class cannot be disabled. |
| RealTime (optional) | Sets the class to be real time. Valid values are "True" and "False". A real time class gets strict priority queuing and no latency. Only one real time class is allowed. The RealTime property of a system class cannot be modified. |
| Share (optional) | Minimum guaranteed bandwidth percentage the traffic class gets. Valid values are 1-99. This value cannot be modified for system classes. The FCoE_Lossless class gets its share from the profile connection configuration. The total share of all enabled classes, excluding the FCoE_Lossless class, is 100. When the share of an enabled class is modified, the share of the Best_Effort class is adjusted to maintain 100% among all enabled classes. An error is returned if the share modification causes the Best_Effort class to have no share. The Share and MaxShare properties of the real time class are set to the same value. When the Share value is modified, the MaxShare is updated automatically, and vice versa. The maximum Share and MaxShare value for a real time class is 50. |
| MaxShare (optional) | The maximum share the traffic class can use when other traffic classes are not using their shares. The valid values are 1-100. This value cannot be modified for a system class, except for the Best_Effort class. The MaxShare value should be greater than or equal to the Share value. |
| EgressDOT1P (optional) | Traffic classified in a particular class egresses with the specified DOT1P priority marking on the VLAN tag. Valid values are 1-7. The EgressDOT1P value must be unique among the enabled classes. System classes have predefined egress DOT1P priority values: 3 for the FCoE_Lossless class and 0 for the Best_Effort class. This value cannot be modified for system classes. |
| Examples | |
| | ->set qos-class Blue Name=Green Renames a class |
| | ->set qos-class Green Enabled=false Disables a class |
| | ->set qos-class Green Enabled=true Share=5 MaxShare=5 RealTime=true Modifies a class to be a real time class |

| Item | Description |
|---------------------|---|
| show qos-class | Display the QoS traffic classes of the active QoS configuration |
| Syntax | show qos-class [<Name> *] [FilterBy] |
| Parameters | |
| Name (optional) | The existing QoS class name. Detailed information of the specified traffic class is displayed. If "*" is specified, then detailed information of all QoS classes is displayed. If the name is not specified, a summary of all classes is displayed. |
| FilterBy (optional) | Filters the output of the show command by the specified attribute in the format <columnID>=<value>. |
| Examples | |
| | ->show qos-class RealTimeClass Displays a specific QoS class |
| | ->show qos-class Displays a summary of all QoS classes |
| | ->show qos-class * Displays detailed information for all QoS classes |
| | ->show qos-class "Real Time"=True Displays all Real Time classes using the FilterBy parameter |

qos-classifier

Manage the traffic classifier for the active QoS configuration.

Supported actions: help, set, show

| Item | Description |
|------------------------|--|
| set qos-classifier | Modify traffic classifier(s) for the active QoS configuration. The classifier is configured on uplink or downlink ports and is used for prioritizing the ingress traffic. The classification is supported for Ethernet and iSCSI traffic. There is no traffic classification for FCoE traffic. |
| Syntax | set qos-classifier <PortType> Classifiers=<classifiers> |
| Parameter | |
| PortType (required) | Type of port to which the classifiers are assigned. Valid values are "Uplinks", "Downlinks", and "All". "Uplinks" represents all uplink ports in the VC domain. "Downlinks" represents all downlink ports in the VC domain. "All" represents all ports in the VC domain. |
| Property | |
| Classifiers (required) | Classification mechanism. Valid values are any combination of "DOT1P" and "DSCP". If the classifier is "DOT1P", then the DOT1P Priority value from the user VLAN tag is used for classification. The DOT1P Priority value is the 3-bit Priority Code Point field defined in IEEE 802.1Q. If the classifier is "DSCP", then the 6-bit Differentiated Services Code Point (DSCP) field in the IP header is used for classification. If the classifiers are "DSCP" and "DOT1P", the IP traffic is classified by the DSCP value in the IP header and the non-IP traffic is classified by the DOT1P Priority value. |
| Examples | |
| | ->set qos-classifier Uplinks classifiers=DOT1P,DSCP Configures uplink ports to use "DSCP" and "DOT1P" to prioritize the ingress traffic |
| | ->set qos-classifier All classifiers=DOT1P Configures all ports to use "DOT1P" to classify the ingress traffic |

| Item | Description |
|----------------------------------|---|
| <code>show qos-classifier</code> | Display the QoS classifier configuration of the active QoS configuration |
| Syntax | <code>show qos-classifier [<PortType> *]</code> |
| Parameter | |
| PortType (optional) | The type of port to which the classifiers are assigned. Valid values are "Uplinks" and "Downlinks". If the port type is not specified, then classifiers for all port types are displayed. |
| Examples | |
| | ->show qos-classifier Displays the classifier settings for both uplink and downlink ports |
| | ->show qos-classifier Uplinks Displays the classifier settings for uplink ports |
| | ->show qos-classifier Downlinks Displays the classifier settings for downlink ports |

qos-map

Manage the traffic classification maps of the active QoS configuration.

Supported actions: help, set, show

| Item | Description |
|--------------------------|--|
| <code>set qos-map</code> | Modify the traffic classification maps of the active QoS configuration |
| Syntax | <code>set qos-map <Type> Class=<traffic class> Values=<DSCP or DOT1P value range list></code> |
| Parameter | |
| Type (required) | The classifier type for the map. Valid values are "DOT1P" and "DSCP". |
| Properties | |
| Class (required) | The destination traffic class name. Values are mapped to the pre-defined classes. A map is active if the map is currently in use for traffic classification. All traffic classes in an active map must be enabled. A value in a map can be mapped to one class only. An inactive map can have both enabled and disabled classes. |
| Values (required) | The list of DOT1P priority values or DSCP values for the map. The format is a comma separated list of single values or hyphen-separated ranges. For a DOT1P map, the supported DOT1P priority values are 0-7. The value 3 is unique. Ingress non-FCoE traffic with a value of 3 is mapped to a user configured traffic class. FCoE traffic (typically tagged with a DOT1P value of 3) is always mapped to the FCoE_Lossless class, regardless of the map values. For a DSCP map, the supported DSCP values are: AF11(DSCP 10), AF12(DSCP 12), AF13(DSCP 14), AF21(DSCP 18), AF22(DSCP 20), AF23(DSCP 22), AF31(DSCP 26), AF32(DSCP 28), AF33(DSCP 30), AF41(DSCP 34), AF42(DSCP 36), AF43(DSCP 38), EF(DSCP 46), CS0(DSCP 0), CS1(DSCP 8), CS2 (DSCP 16), CS3(DSCP 24), CS4(DSCP 32), CS5(DSCP 40), CS6(DSCP 48), and CS7(DSCP 56). The range assumes this order. Unsupported DSCP values are mapped to the Best_Effort class. You cannot map a value to the FCoE_Lossless class. If a supported value is not specified in the value list, the previous mapping values stored in the map are used. |
| Examples | |
| | ->set qos-map DOT1P Class=Interactive Values=2,4-6 Modifies the DOT1P mapping |

| Item | Description |
|------|--|
| | ->set qos-map DSCP Class=Backup Values=CS0,AF11-AF22,AF33 Modifies the DSCP mapping for CS0, AF11, AF12, AF13, AF21, AF22, AF33 |

| Item | Description |
|------------------|---|
| show qos-map | Display the traffic classification maps of the active QoS configuration |
| Syntax | show qos-map [<Type> *] |
| Parameter | |
| Type (optional) | Type of map. Valid values are "DOT1P" and "DSCP". If the type is not specified, all maps are displayed. |
| Examples | |
| | ->show qos-map DSCP Displays DSCP mapping |
| | ->show qos-map DOT1P Displays DOT1P mapping |
| | ->show qos-map Displays all classification mappings |

qos

Manage the quality of service configurations.

Supported actions: help, reset, set, show

| Item | Description |
|--|---|
| reset qos | Reset the currently active and saved QoS configuration to the default configuration. You are prompted for confirmation unless you specify the <code>quiet</code> option. |
| Syntax | reset qos [-active <Type> *] [-quiet] |
| Parameter | |
| Type (required if Active is not specified) | Resets the classes, maps, and classifiers for the specified QoS configuration type. The supported types are "Passthrough", "CustomWithFCoE", or "CustomNoFCoE". If '*' is specified, then all three QoS configurations are reset to the factory default settings, and the QoS configuration type is set to "Passthrough". |
| Options | |
| Active | Resets the classes, maps, and classifiers of the active QoS configuration. The active QoS configuration is the configuration selected using the <code>set qos</code> command. This option cannot be used in conjunction with the <code>Type</code> parameter. |
| quiet | Suppresses user confirmation prompts |
| Examples | |
| | ->reset qos -active Resets the active QoS configuration type to the factory default settings but does not change the saved configuration types |
| | ->reset qos CustomWithFCoE Resets the specified QoS configuration type to the factory default settings but does not change the saved configuration types |
| | ->reset qos * Resets the active QoS configuration type to "Passthrough", and resets all the saved configuration types to the factory default settings. You are prompted to confirm the operation. |
| | ->reset qos * -quiet Resets the active QoS configuration type to "Passthrough", and resets all the saved |

| Item | Description |
|------|---|
| | configuration types to the factory default settings |

| Item | Description |
|------------------|--|
| set qos | Sets the specified QoS configuration as the active configuration. After the active QoS configuration is set, use the following commands to configure the configuration: qos-class, qos-map, and qos-classifier. |
| Syntax | set qos <Type> |
| Parameter | |
| Type (required) | <p>The QoS configuration type. Valid values are "Passthrough", "CustomWithFCoE", and "CustomNoFCoE". The default value is "Passthrough". If the Type is "Passthrough", then QoS is not enabled. The DOT1P priority, DSCP, and other markings are passed through VC, but not used for traffic classification or bandwidth management for the Ethernet traffic. A non-FCoE packet with DOT1P priority 3 is changed to 0, because priority 3 is reserved for FCoE packets.</p> <p>If the Type is "CustomWithFCoE" or "CustomNoFCoE", then this command changes the active QoS configuration as specified. For "CustomWithFCoE", eight traffic classes are configured, including four pre-defined classes and four user classes. The pre-defined classes are Best_Effort, Medium, Real_Time, and FCoE_Lossless, which are enabled by default. Best_Effort and FCoE_Lossless classes are system classes and cannot be disabled.</p> <p>For CustomNoFCoE, eight traffic classes are configured, including three pre-defined classes and five user classes. The pre-defined classes are Best_Effort, Medium, and Real_Time, which are enabled by default. The Best_Effort class cannot be disabled. For CustomNoFCoE, the FCoE_Lossless class is not included. If an FCoE fabric, an FCoE network, or a profile with fcoe-connection exists, you cannot change to the CustomNoFCoE configuration.</p> |
| Examples | |
| | ->set qos Passthrough Disables QoS |
| | ->set qos CustomWithFcoe Changes the QoS configuration to be customized with FCoE |
| | ->set qos CustomNoFCoE Changes the QoS configuration to be customized without FCoE |

| Item | Description |
|-------------------|---|
| show qos | Displays the quality of service configurations. |
| Syntax | show qos [<Type> * -active] |
| Parameter | |
| Type (optional) | <p>The QoS configuration type. Valid values are "Passthrough", "CustomWithFCoE", and "CustomNoFCoE". If no Parameter is specified, a summary listing of all configuration types is displayed. If Type is specified, detailed information for the specified QoS configuration is displayed, including type, traffic classes, traffic classifiers, and traffic classification maps, displayed if applicable. If '*' is specified, detailed information for all QoS configurations is displayed.</p> |
| Option | |
| Active (optional) | Displays detailed information for the active QoS configuration. The active QoS configuration is the configuration selected using the set qos command. |
| Examples | |
| | ->show qos Displays a summary list of all QoS configuration types |

| Item | Description |
|------|--|
| | ->show qos CustomWithFCoE Displays detailed information for the specified QoS configuration |
| | ->show qos -active Displays detailed information for the active QoS configuration |
| | ->show qos * Displays detailed information for all QoS configurations |

radius-group

Manage Virtual Connect RADIUS groups.

Supported actions: add, help, remove, set, show

| Item | Description |
|------------------------|---|
| add radius-group | Add a RADIUS group. |
| Syntax | add radius-group <GroupName> [Description=<string>] [Roles=<roles>] |
| Parameters | |
| GroupName (required) | The name of the RADIUS group being added. The name can consist of alphanumeric characters, hyphens (-), underscores (_) and periods (.). The maximum length of the name is 255 characters. |
| Properties | |
| Description (optional) | An informational description for the new group being added. The description can consist of 0 to 20 alphanumeric characters, dash (-), underscore (_), or period (.), backslash (\) and single-quote ('). |
| Roles (optional) | A set of one or more privileges for the group. Valid values are any combination of "domain", "server", "network", and "storage". Separate multiple values with commas. If privileges are not specified, then the group has no privileges and can only view information. If "*" is specified, it indicates all privileges. |
| Example | |
| | ->add radius-group MyNewGroup Description="Test Group" Roles=domain,server Adds a new RADIUS group |

| Item | Description |
|----------------------|--|
| remove radius-group | Remove an existing RADIUS group. |
| Syntax | remove radius-group <GroupName *> |
| Parameter | |
| GroupName (required) | The name of an existing RADIUS group to be removed. Use "*" to remove all RADIUS groups. |
| Examples | |
| | ->remove radius-group MyGroup Removes a specified RADIUS group |
| | ->remove radius-group * Removes all RADIUS groups |

| Item | Description |
|------------------------|--|
| set radius-group | Modify the properties of an existing RADIUS group. |
| Syntax | set radius-group <GroupName> [Description=<description>] [Roles=<roles>] |
| Parameter | |
| GroupName (required) | The name of an existing group to modify |
| Properties | |
| Description (optional) | A user-friendly description for the group |
| Roles (optional) | A set of one or more privileges for the group. Valid values are any combination of "domain", "server", "network", and "storage". Separate multiple values with commas. |
| Example | |
| | ->set radius-group MyGroup Description="Test Group" Roles=domain,server,network Modifies a RADIUS group description and privileges |

| Item | Description |
|----------------------|---|
| show radius-group | Display the existing RADIUS groups. |
| Syntax | show radius-group [<GroupName> *] |
| Parameter | |
| GroupName (optional) | The name of an existing RADIUS group in the domain. Use "*" to display detailed information for all RADIUS groups. If no value is specified, a summary of all groups appears. |
| Examples | |
| | ->show radius-group Displays a summary of all RADIUS groups |
| | ->show radius-group MyGroup Displays detailed information for a specific RADIUS group |
| | ->show radius-group * Displays detailed information for all RADIUS groups |

radius

Manage RADIUS authentication settings.

Supported actions: help, set, show

| Item | Description |
|-------------------|--|
| set radius | Modify and test the Virtual Connect RADIUS authentication settings. |
| Syntax | set radius [-test] [Enabled=<true false>] [ServerAddress=<IP Address DNS Name>] [Port=<portNum>] [ServerKey=<key>] [Timeout=<timeout>] [SecondaryServerAddress=<IP Address DNS Name>] [SecondaryPort=<portNum>] [SecondaryServerKey=<key>] [SecondaryTimeout=<timeout>] |
| Option | |
| Test (optional) | Tests the RADIUS configuration without applying changes |
| Properties | |

| Item | Description |
|-----------------------------------|--|
| Enabled (optional) | Enables or disables RADIUS authentication. Valid values include "true" and "false". |
| ServerAddress (optional) | The IP address or the DNS name of the primary RADIUS server used for authentication |
| Port (optional) | The server UDP port number. Valid values include a valid port number between 1 and 65535. The default port is 1812. |
| ServerKey (optional) | The plain-text string used to encrypt user details exchanged with the primary RADIUS server. It must match the server key configured for this VC on the primary server. RADIUS authentication will not work if the server key is blank or null. |
| Timeout (optional) | The time in seconds that VCM should wait before timing out the request. If the primary server times out and a secondary server is configured, VCM attempts the request on the secondary server. If the secondary server times out, the request fails. The valid range of values is from 1 to 600 seconds. The default timeout is 10 seconds. |
| SecondaryServerAddress (optional) | The IP address or host name of the secondary RADIUS server used for authentication |
| SecondaryPort (optional) | The UDP port to use for RADIUS communication. Valid values include a valid port number between 1 and 65535. The default UDP port number is 1812. |
| SecondaryServerKey (optional) | The plain-text string used to encrypt user details exchanged with the secondary RADIUS server. It must match the server key configured for this VC on the secondary server. The RADIUS authentication will not work if the shared key is blank or null. |
| SecondaryTimeout (optional) | The timeout value in seconds for RADIUS communication with the secondary server |
| Examples | |
| | <pre>->set radius -test Enabled=true ServerAddress=192.168.0.27 ->set radius -test Enabled=true ServerAddress=2001::70</pre> Tests the RADIUS configuration changes without applying them |
| | <pre>->set radius Enabled=true ServerAddress=192.168.0.124 ServerKey=test123 SecondaryServerAddress=radserver.hp.com SecondaryServerKey=test456 ->set radius Enabled=true ServerAddress=2001::40 ServerKey=test123 SecondaryServerAddress=radserver.hp.com SecondaryServerKey=test456</pre> Enables RADIUS authentication for users |

| Item | Description |
|----------------|---|
| show radius | Display the Virtual Connect RADIUS authentication settings. |
| Syntax | show radius |
| Example | |
| | <pre>->show radius</pre> Displays RADIUS information |

role

Manage role-based user authentication.

Supported actions: help, set, show

| Item | Description |
|-----------------------|---|
| set role | Configure the authentication order or permitted operations for a VC role. |
| Syntax | set role <RoleName> Order=<order> Operations=<operations> |
| Parameter | |
| RoleName (required) | The VC privilege/role for which the existing authentication order is to be set. Valid values are "domain", "network", "server", and "storage". |
| Property | |
| Order (optional) | The order of authentication to be set for a given role, specified as one or more authentication methods separated by a comma. The format is <method1,method2,method3>. Valid values are "ldap", "radius", "tacacs", and "local". |
| Operations (optional) | The operation permissions to be set for a given role, specified as one or more role operations separated by a comma. Valid values are "FirmwareUpdate", "SaveConfig", "RestoreConfig", "SupportFiles", "PortMonitoring", "Default" (Factory Default), "*" (All), " (None). Enabling the "FirmwareUpdate" also requires enabling "SaveConfig" and "SupportFiles" so that the VCSU firmware update works properly. |
| Examples | |
| | ->set role network Order=tacacs,radius Sets the order for the network privilege to be TACACS+, followed by RADIUS |
| | ->set role server Order=ldap,radius,tacacs Sets the order for the server privilege to be LDAP, followed by RADIUS, followed by TACACS+ |
| | ->set role network operations=SupportFiles,PortMonitoring Sets the network role operation permissions to "SupportFiles" and "PortMonitoring" |
| | ->set role server operations=* Sets the server role operation permissions to all operations enabled |
| | ->set role server operations= Sets the storage role operation permissions to all operations disabled |
| | ->set role domain operations=Default Sets the domain role operation permissions back to factory default |

| Item | Description |
|---------------------|--|
| show role | Display the current authentication order and operation permissions for a VC role. |
| Syntax | show role [<RoleName> *] |
| Parameter | |
| RoleName (optional) | The name of a VC role for which the existing authentication order is to be displayed. Valid values are "domain", "server", "network", and "storage". Use "*" to display detailed information for all user roles. If not specified, a summary of all roles appears. |
| Examples | |
| | ->show role Displays a summary authentication order of all user roles |
| | ->show role domain Displays the authentication order for the domain user role |
| | ->show role * Displays the authentication order for all user roles |

server-port-map-range

Manage ranges of shared server downlink port mapping configurations.

Supported actions: add, help, remove

| Item | Description |
|---------------------------|---|
| add server-port-map-range | Add a new server port network mapping range, and allow server ports to be shared among multiple VC Ethernet networks. |
| Syntax | add server-port-map-range <ConnectionId> UplinkSet=<Uplink Set Name> VLANIDs=<VLAN ID Range List> [MatchUplinkSet=<true false>] |
| Parameters | |
| ConnectionId (required) | The ID of an existing Ethernet connection associated with a profile and a server port. The format of the ConnectionID is <ProfileName:PortNumber>. |
| Properties | |
| Uplinkset (required) | The name of the shared uplink set to use with the server port mapping |
| VLANIDs (required) | The VLAN IDs to use for the mapping. The format is a comma-separated list of VLAN ID ranges, where a range is either a single VLAN ID or a hyphen-separated pair of VLAN IDs that identify a range of VLAN IDs. Valid VLAN ID values include 1 to 4094. |
| MatchUplinkSet (optional) | Requires that the VLANs used for mappings match the VLAN IDs specified on the identified Uplink Set. If set to false, the command will not set the profile connection associated uplink set attribute (but will use the uplink set VLAN IDs from the uplink set). If there are already server port map entries for the specified profile connection, then either the uplink set must match or the port map entries must not have the associated uplink set attribute specified. The default value of this attribute is "false". |
| Examples | |
| | ->add server-port-map-range MyProfile:1 UplinkSet=MyUplinkSet1 VLanIds=101-124,214 Adds multiple networks to a server-port-map |
| | ->add server-port-map-range MyProfile:2 UplinkSet=MyUplinkSet2 VLanIds=1-20 MatchUplinkSet=true Adds multiple networks to a server-port-map and locks VLANs to an uplink set |

| Item | Description |
|------------------------------|---|
| remove server-port-map-range | Remove one or more server port network mappings. |
| Syntax | remove server-port-map-range <ConnectionId> VLANIDs=<VLAN ID Range List> |
| Parameters | |
| ConnectionId (required) | The ID of an existing Ethernet connection associated with a profile and a server port. The format of the Connection ID is <ProfileName:PortNumber>. |
| VLANIDs (required) | The list of VLAN IDs to be removed from the mapping. The format is a comma-separated list of VLAN ID ranges, where a range is either a single VLAN ID or a hyphen-separated pair of VLAN IDs that identify a range of VLAN IDs. Valid VLAN ID values include 1 to 4094. |
| Example | |
| | ->remove server-port-map-range MyProfile:1 VLanIds=151-170,215 Removes multiple server port network mappings |

server-port-map

Manage shared server downlink port mapping configuration.

Supported actions: add, help, remove, set, show

| Item | Description |
|-------------------------|---|
| add server-port-map | Add a new server port network mapping, and allow server ports to be shared among multiple VC Ethernet networks. |
| Syntax | add server-port-map <ConnectionId> <Network Name> [Uplinkset=<Uplink Set Name>] [VlanID=<Vlan ID>] [Untagged=<true false>] |
| Parameters | |
| ConnectionID (required) | The ID of an existing Ethernet connection associated with a profile and a server port. The format of the ConnectionID is <ProfileName:PortNumber>. |
| Network (required) | The name of a valid network to which the mapping is added. A network can be configured once for every profile connection. Every profile connection can be configured for a maximum of 28 networks in legacy VLAN mode or 162 networks in expanded VLAN mode. |
| Properties | |
| Uplinkset (optional) | The name of the shared uplink set to use with the server port mapping. If the domain setting SharedServerVlanId is set to "true", Uplinkset is a required value. |
| VlanID (optional) | The VLAN ID to use for the mapping. Valid values include 1 to 4094. If the uplink set name is specified, the VlanID property should not be specified, because the server VLAN ID is forced to be same as the VLAN ID used when adding the network to the shared uplink set. |
| Untagged (optional) | Enables or disables the network to handle untagged packets. Only one network in an Ethernet network connection can handle untagged packets. The default value is "false". If a shared uplink set is used, the untagged network is the same as the native network, if present, but any other network can be configured to handle untagged packets. |
| Examples | |
| | ->add server-port-map MyProfile:1 Network1 VlanID=100 Adds a new server port to dedicated network mapping |
| | ->add server-port-map MyProfile:2 RedNetwork Uplinkset=MyUplinkSet1 Adds a new server port to shared network mapping |
| | ->add server-port-map MyProfile:3 GreenNetwork Uplinkset=MyUplinkset1 UnTagged=true Adds a new server port to shared network mapping and enables untagged packet handling |

| Item | Description |
|-------------------------|--|
| remove server-port-map | Remove a server port network mapping. |
| Syntax | remove server-port-map <ConnectionID *> [<Network Name>] |
| Parameters | |
| ConnectionID (required) | The ID of an existing Ethernet connection associated with a profile and a server port. The format of the ConnectionID is <ProfileName:PortNumber>. Use "*" to remove all server-port-map configurations from the domain. |
| Network (optional) | The name of an Ethernet network on which the mapping exists |
| Examples | |

| Item | Description |
|------|---|
| | ->remove server-port-map MyProfile:1 RedNetwork Removes a server port network mapping |
| | ->remove server-port-map MyProfile:1 * Removes all server port network mappings from a profile |
| | ->remove server-port-map * Removes all server port mappings in the domain |

| Item | Description |
|-------------------------|---|
| set server-port-map | Modify an existing server port network mapping. This command cannot be used if the network is associated with a shared uplink set. |
| Syntax | set server-port-map <ConnectionID> <Network Name> [VlanID=<VlanID>] [Untagged=<true false>] |
| Parameters | |
| ConnectionID (required) | The ID of an existing Ethernet connection associated with a profile and a server port. The format of the ConnectionID is <ProfileName:PortNumber>. |
| Network (required) | The name of a valid Ethernet network on which the mapping exists |
| Properties | |
| VlanID (optional) | The new VLAN ID to be used for server port network mapping. Valid values include 1 to 4094. |
| Untagged (optional) | Enables or disables the network to handle untagged packets. Only one network in an Ethernet network connection can handle untagged packets. The default value is "false". If a shared uplink set is used, the untagged network is the same as the native network, if present, but any network can also be configured to handle untagged packets. When changing a network untagged option from "true" to "false", you must specify a VlanID if the global option SharedServerVlanId is set to "false". |
| Examples | |
| | ->set server-port-map MyProfile:1 Network1 VlanId=100 Modifies the VLAN ID of an existing server port network mapping |
| | ->set server-port-map MyProfile:1 Network1 Untagged=true Modifies the existing server port network mapping to handle untagged packets |

| Item | Description |
|-------------------------|--|
| show server-port-map | Display a server port network mapping. |
| Syntax | show server-port-map [<ConnectionID> *] |
| Parameter | |
| ConnectionID (optional) | The ID of an existing Ethernet connection associated with a profile and a server port. The format of the ConnectionID is <ProfileName:PortNumber>. |
| Examples | |
| | ->show server-port-map Displays a summary of all the server port mappings |
| | ->show server-port-map MyProfile:1 Displays the server port mapping for a profile |
| | ->show server-port-map * Displays detailed output of all server port mappings |

server-port

Display the physical server ports.

Supported actions: help, show

| Item | Description |
|-------------------------------|---|
| <code>show server-port</code> | Display physical server port information. If the port is unlinked and no connectivity exists, the cause is displayed. For more information about possible causes, see "Port status conditions (on page 201)." |
| Syntax | <code>show server-port [<PortID>]</code> |
| Parameter | |
| PortID (Optional) | The reference of a port mapping ID. The PortID format is <EnclosureID:IOBay:Port>. The PortID can be referenced from the ID column in the summary. The detailed display shows all FlexNICs that could be associated with a server port. |
| Examples | |
| | <code>->show server-port</code> Displays a summary of all physical server ports |
| | <code>->show server-port *</code> Displays detailed information for all physical server ports |
| | <code>->show server-port enc0:3:d2</code> Displays detailed information for a specific server port |
| | <code>->show server-port enc0:1:d4</code> Displays detailed information for the Device Control Channel |

server

Manage server blades.

Supported actions: help, poweroff, poweron, reboot, show

| Item | Description |
|------------------------------|---|
| <code>poweroff server</code> | Power off one or more physical servers. |
| Syntax | <code>poweroff server <ServerID *> [-Force -ForceOnTimeout] [-timeout=<timeout>]</code> |
| Parameter | |
| ServerID (required) | The ID of a physical server in the domain. The format of the server ID is <EnclosureID:DeviceBay>. If the EnclosureID is not specified, the local enclosure is used by default. Use "*" to power off all servers in the domain. For a multi-blade server, the ServerID must be that of the monarch bay. This is the ID displayed by the <code>show server</code> command. |
| Options | |
| Force | Forces a power off operation without waiting for the operating system to shut down gracefully. Only use this option as a last resort, because it can cause potential data loss on the server. |
| ForceOnTimeout | Attempts a graceful shutdown, but if the server does not shut down within the timeout period (60 seconds by default), the server is forced to power off. |
| Timeout | Specifies the timeout period (in seconds) to wait for the operation to complete (per server). The default timeout is 60 seconds. |
| Examples | |
| | <code>->poweroff server enc0:2</code> Powers off the server in device bay 2 of the local enclosure |
| | <code>->poweroff server enc0:2 -Force</code> Forces the server in device bay 2 of the local enclosure to power off |

| Item | Description |
|------|--|
| | ->poweroff server * Powers off all servers in the domain |
| | ->poweroff server enc0:* Powers off all servers in the local enclosure |
| | ->poweroff server enc0:2 -ForceOnTimeout Attempts a graceful shutdown, but forces a shutdown at the end of the timeout period |
| | ->poweroff server * -Timeout=180 Powers off all servers and specifies a custom timeout of 3 minutes |
| | ->poweroff server enc0:1 Powers off the multi-blade server in bays 1-4 of the local enclosure |

| Item | Description |
|---------------------|--|
| poweron server | Power on one or more physical servers. |
| Syntax | poweron server <ServerID *> [-Timeout=<timeout>] |
| Parameter | |
| ServerID (required) | The ID of a server in the domain. The format of the server ID is <EnclosureID:DeviceBay>. If the EnclosureID is not specified, the local enclosure is used by default. Use "*" to power on all servers in the domain. For a multi-blade server, the ServerID must be that of the monarch bay. This is the ID displayed by the show server command. |
| Option | |
| Timeout | The timeout period (in seconds) to wait for the operation to complete. The default timeout is 60 seconds. |
| Examples | |
| | ->poweron server 2 Powers on the server in bay 2 of the local enclosure |
| | ->poweron server * Powers on all servers in the domain |
| | ->poweron server enc0:* Powers on all servers in the local enclosure |
| | ->poweron server * -Timeout=120 Powers on all servers in the domain and specifies a custom timeout of 2 minutes |
| | ->poweron server enc0:1 Powers on the multi-blade server in bays 1-4 of the local enclosure |

| Item | Description |
|---------------------|--|
| reboot server | Reboot one or more physical servers. |
| Syntax | reboot server <ServerID *> [-Force] [-ForceOnTimeout] [-timeout=<timeout>] |
| Parameter | |
| ServerID (required) | The ID of a server in the domain. The format of the server ID is <EnclosureID:DeviceBay>. If the EnclosureID is not specified, the local enclosure is used by default. Use "*" to reboot all servers in the domain. For a multi-blade server, the ServerID must be that of the monarch bay. This is the ID displayed by the show server command. |
| Options | |
| Force | Forces a reboot operation without waiting for the operating system to shut down gracefully. Only use this option as a last resort, because it can cause potential data loss on the server. |

| Item | Description |
|-----------------|--|
| ForceOnTimeout | Attempts a graceful shutdown, but if the server does not shut down within the timeout period (60 seconds by default), then the server is forced to reboot. |
| Timeout | Specifies the timeout period (in seconds) to wait for the operation to complete (per server). The default timeout is 120 seconds. |
| Examples | |
| | ->reboot server 2 Reboots the server in device bay 2 of the local enclosure |
| | ->reboot server enc0:2 -Force Forces the server in device bay 2 of the local enclosure to reboot |
| | ->reboot server * -ForceOnTimeout -Timeout=180 Attempts a graceful shutdown, but forces a reboot on all servers after a timeout of 2 minutes |
| | ->reboot server * Reboots all servers in the domain |
| | ->reboot server enc0:* Reboots all servers in the local enclosure |
| | ->reboot server enc0:1 Reboots the multi-blade server in bays 1-4 of the local enclosure |

| Item | Description |
|---------------------|---|
| show server | Display all servers in the domain. |
| Syntax | show server <ServerID *> |
| Parameter | |
| ServerID (optional) | The ID of a server in the domain. The format of the server ID is <EnclosureID:Bay>. If the EnclosureID is not specified, the local enclosure is used by default. For a multi-blade server, the ServerID must be that of the monarch bay. This is the ID shown in the summary listing. |
| Examples | |
| | ->show server Displays a summary of all servers |
| | ->show server * Displays detailed information for all servers |
| | ->show server enc1:* Displays detailed information for all servers in a remote enclosure |
| | ->show server enc0:4 Displays detailed information for the server in device bay 4 of the local enclosure |
| | ->show server enc0:5 Displays detailed information for the multi-blade server in bays 5-8 of the local enclosure |

serverid

Manage virtual server ID configuration settings.

Supported actions: help, set, show

| Item | Description |
|--------------|--|
| set serverid | Modify virtual server ID domain settings. The serial number attributes can be changed only in one of the following scenarios: <ul style="list-style-type: none"> The virtual server ID source type is "Factory-Default". The virtual server ID source type is "VC-Defined" or "User-Defined", but no |

| Item | Description |
|--|--|
| | <p>profiles are using server IDs from this source.</p> <ul style="list-style-type: none"> The virtual server ID source type is "User-Defined", and the range is being extended by lowering the start value or increasing the end value. |
| Syntax | set serverid Type=Factory-Default |
| | set serverid Type=VC-Defined [PoolID=<1-64>] |
| | set serverid Type=User-Defined Start=VCX01nnnnn End=VCX01nnnnn |
| Properties | |
| Type (required) | The type of the virtual serial number source. When server profiles are created, the UUID values are not allocated from the pool, the virtual serial number is allocated from the pool; and the virtual UUID is randomly generated. Valid values include "Factory-Defined" (default), "VC-Defined", and "User-Defined". |
| PoolID (optional) | The VC-Defined Pool ID to be used. If not specified, the default Pool ID is 1. This property is only valid for VC-Defined serial number types. |
| Start (required if Type is User-Defined) | The starting serial number in a user-defined range. This property is only valid for User-Defined serial number types. User-Defined serial number ranges should start with the pattern VCX01. |
| End (required if Type is User-Defined) | The ending serial number in a user-defined range. This property is only valid for User-Defined serial number types. User-Defined serial number ranges should start with the pattern VCX01. |
| Examples | |
| | ->set serverid Type=Factory-Default Modifies virtual server ID settings to use factory default serial numbers |
| | ->set serverid Type=VC-Defined PoolId=5 Modifies virtual server ID settings to use VC-defined serial numbers |
| | ->set serverid Type=User-Defined Start=VCX0000001 End=VCX0100010 Modifies virtual server ID settings to use a custom, user-defined serial number range |

| Item | Description |
|----------------|--|
| show serverid | Display virtual server ID configuration properties. |
| Syntax | show serverid |
| Example | |
| | ->show serverid Displays virtual server ID configuration properties |

session

Manage the session timeout value.

Supported actions: help, set, show

| Item | Description |
|--------------------|---|
| set session | Modify the session timeout value. |
| Syntax | set session Timeout=<Number of Minutes> |
| Property | |
| Timeout (required) | Number of minutes from 10 to 1440 to expire idle sessions. Use "0" to disable session timeout (user sessions never expire). The default value is 15 minutes. If the Session Timeout value is lowered, currently inactive sessions can be removed. |

| Item | Description |
|-----------------|--|
| Examples | |
| | ->set session Timeout=20 Sets idle user sessions to expire after 20 minutes of inactivity |
| | ->set session Timeout=0 Disables session timeout (user sessions never expire) |

| Item | Description |
|--------------------|--|
| show session | Display the session properties |
| Syntax | show session timeout |
| Option | |
| Timeout (required) | Displays the session timeout value |
| Example | |
| | ->show session timeout Displays the current session timeout value |

sflow

Configures an existing VC Ethernet network with sFlow.

Supported actions: set, help, show

| Item | Description |
|-------------------|--|
| set sflow | Associate the existing shared or unshared network for sFlow. Disassociate the network assignment for sFlow by passing an empty string. |
| Syntax | set sflow Network=<Network name> |
| Properties | |
| Network | Specifies the name of the existing VC Ethernet network through which the sFlow datagram traffic is sent to the sFlow receivers |
| Examples | |
| | ->set sflow network=Network1 Associates the existing network for sFlow configuration |
| | ->set sflow network= Disassociates the network from sFlow configuration |

| Item | Description |
|----------------|--|
| show sflow | Displays the sFlow network configuration and status. |
| Syntax | show sflow |
| Example | |
| | ->show sflow Displays the sFlow network configuration and status. |

sflow-module

Configure the network interface settings created for sflow.

Supported actions: help, reset, set, show

| Item | Description |
|---------------------|--|
| reset sflow-module | Reset the sflow module. |
| Syntax | reset sflow-module <ModuleID *> |
| Parameter | |
| ModuleID (required) | Specifies the interconnect module whose network interface is being reset. The format is <EnclosureId>:<BayNumber>. The module network configuration cannot be reset if the module ports are being sampled or polled by any of the receivers. |
| Examples | |
| | ->reset sflow-module enc0:1 Resets the module network interface configuration on enc0:1 |
| | ->reset sflow-module * Resets the module network interface configuration on all associated sflow modules |

| Item | Description |
|-----------------------|--|
| set sflow-module | Modify an sflow module. |
| Syntax | set sflow-module <ModuleID> DHCP=<Enabled/Disabled> [IpAddress=<IPAddress> SubnetMask=<mask>[Gateway=<Gateway>]] |
| Parameter | |
| ModuleID (required) | Specifies the interconnect module whose network interface is being configured. The format is <EnclosureId>:<BayNumber>. |
| Properties | |
| DHCP (required) | Specifies if the network interface created for sflow is being configured through DHCP or by a user providing the static IP settings. |
| IpAddress (optional) | Specifies a valid IP address to use for the network interface created for sflow network configuration. This property is required if DHCP is disabled. |
| SubnetMask (optional) | Specifies a valid subnet mask for the network interface created for sflow network configuration. This property is required if DHCP is disabled. |
| Gateway (optional) | Specifies a valid gateway address for the network interface created for sflow. This property is specified if DHCP is disabled. When DHCP is disabled, the user should provide a unique IP address for each module. |
| Example | |
| | ->set sflow-module enc0:1 DHCP=Enabled Enables DHCP on the enc0:1 module |
| | ->set sflow-module enc0:1 DHCP=Disabled IpAddress=10.10.1.11 SubnetMask=255.255.252.0 Gateway=10.10.10.1 Configures the static IP settings on enc0:1 |

| Item | Description |
|---------------------|--|
| show sflow-module | Display the sflow module. |
| Syntax | show sflow-module [<ModuleID *> |
| Parameter | |
| ModuleID (optional) | Specifies the interconnect module whose network interface is being displayed. The format is <EnclosureId>:<BayNumber>. |
| Examples | |

| Item | Description |
|------|---|
| | ->show sflow-module Displays all sflow modules |
| | ->show sflow-module enc0:1 Displays the specified sflow module |

sflow-ports

Configure the ports to be sampled or polled for a receiver.

Supported actions: add, help, remove, set, show

| Item | Description |
|-----------------------------|--|
| add sflow-ports | Add a port to be sampled or polled for a receiver. |
| Syntax | add sflow-ports <ReceiverName>[SamplePorts=<PortID list>[SamplingRates=<SamplingRate list>][Direction=<Ingress Egress Both>]][PollPorts=<Port ID list> [PollingIntervals=<PollingInterval list>]] |
| Parameter | |
| ReceiverName (required) | Specifies the unique name of the receiver. A valid receiver name can have a minimum of one character and maximum of 64 characters. Only alphanumeric characters, -(hyphen), and _(underscore) are allowed. White spaces are not allowed. |
| Properties | |
| SamplePorts (optional) | Specifies a list of enet module ports to be sampled for flow samples. The ports are specified as a comma separated list where each port is in the format <EnclosureID>:<InterconnectBay>[:<PortNumber1[-PortNumberN]>]. |
| SamplingRates (optional) | Specifies the statistical sampling rate of packets on a port. Each sampling rate has a corresponding port in the SamplePorts list. The valid sampling rate can be an integer from 256 to 16777216. The default value is 4096. |
| Direction (optional) | Specifies the direction of the network traffic on the port to be sampled. The valid values are "Ingress", "Egress", or "Both". The default value is "Both". |
| PollPorts (optional) | Specifies a list of enet module ports to be polled for counter samples. The ports are specified as a comma separated list where each port is in the format: <EnclosureID>:<InterconnectBay>[:<PortNumber1[-PortNumberN]>]. |
| PollingIntervals (optional) | Specifies the polling interval which is the maximum number of seconds between successive samples of the counters associated with these ports. Each value in the list of polling interval has a corresponding port in the PollPorts list. The valid polling interval range is from 1 to 65535 seconds. The default value is "10 seconds". Disable polling on a port using the <code>remove sflow-ports</code> command. Configure the module network using the <code>set sflow-module</code> command before adding the module port for sampling or polling to a receiver. |
| Examples | |
| | ->add sflow-ports Alpha SamplePorts=enc0:1:d1,enc0:2,enc0:1:d3-d10 Samplingrates=256,1024,2048 Direction=IngressPollPorts=enc0:1:d2,enc0:1:d3,enc0:1:d4 PollingIntervals=10,1,5 Adds sample and polling ports |

| Item | Description |
|-------------------------|--|
| remove sflow-ports | Removes ports from an sflow receiver |
| Syntax | remove sflow-ports <ReceiverName> [[SamplePorts=<PortID list *>][PollPorts=<PortID list *>]] |
| Parameter | |
| ReceiverName (required) | The name of an existing sflow receiver in the domain |
| Properties | |
| SamplePorts (optional) | Specifies a list of sample ports to be removed from a receiver. "*" removes all sample ports from the receiver. The ports are specified as a comma separated list where each port is in the format: <EnclosureID>:<InterconnectBay>[:<PortNumber1[-PortNumberN]>]. The ID for the sample port can be referenced from the output of the show sflow-ports command. |
| PollPorts (optional) | Specifies a list of polling ports to be removed from a receiver. "*" removes all polling ports from the receiver. The ports are specified as a comma separated list where each port is in the format: <EnclosureID>:<InterconnectBay>[:<PortNumber1[-PortNumberN]>]. The ID for the poll port can be referenced from the output of the show sflow-ports command. |
| Examples | |
| | ->remove sflow-ports Alpha SamplePorts=enc0:1:d1,enc0:1:d3 Removes a sample port |
| | ->remove sflow-ports Alpha PollPorts=enc0:1:d1,enc0:1:d Removes a polling port |
| | ->remove sflow-ports Alpha SamplePorts=* Removes all sample ports |
| | ->remove sflow-ports Alpha PollPorts=* Remove all polling ports |

| Item | Description |
|--------------------------|--|
| set sflow-ports | Modify a port to be sampled or polled for a receiver. |
| Syntax | set sflow-ports <ReceiverName> [SamplePorts=<PortID list>[SamplingRates=<SamplingRate list>][Direction=<Ingress Egress Both>]][PollPorts=<Port ID list>PollingIntervals=<PollingInterval list>] |
| Parameters | |
| ReceiverName (required) | The name of an existing sflow receiver in the domain |
| Properties | |
| SamplePorts (optional) | Specifies a list of VC enet module ports whose sampling rates are to be modified. The ports are specified as a comma separated list where each port is in the format: <EnclosureID>:<InterconnectBay>[:<PortNumber1[-PortNumberN]>]. The ID for the sample port can be referenced from the output of the show sflow-ports command. |
| SamplingRates (optional) | Specifies the statistical sampling rate of packets on a port. Each sampling rate has a corresponding port in the SamplePorts list. The valid sampling rate can be an integer from 256 to 16777216. The default value is 4096. |
| Direction (optional) | Specifies the direction of the network traffic on the port to be sampled. The valid values are "Ingress", "Egress", or "Both". The default value is "Both". |

| Item | Description |
|-----------------------------|--|
| PollPorts (optional) | Specifies a list of VC enet module ports whose polling intervals are to be modified. The ports are specified as a comma separated list where each port is in the format: <EnclosureID>:<InterconnectBay>[:<PortNumber1[-PortNumberN]>]. The ID for the poll port can be referenced from the output of the <code>show sflow-ports</code> command. |
| PollingIntervals (optional) | Specifies the polling interval which is the maximum number of seconds between successive samples of the counters associated with these ports. Each value in the list of polling interval has a corresponding port in the PollPorts list. The valid polling interval range is from 1 to 65535 seconds. The default value is "10 seconds". Disable polling on a port using the <code>remove sflow-ports</code> command. Configure the module network using the <code>set sflow-module</code> command before adding the module port for sampling or polling to a receiver. |
| Examples | |
| | <pre>->set sflow-ports Alpha SamplePorts=enc0:1:d1 Samplingrates=2048 Direction=Both PollPorts=enc0:1:d4 PollingIntervals=10</pre> Modifies sample and polling ports |

| Item | Description |
|-------------------------------|---|
| <code>show sflow-ports</code> | Display the port to be sampled or polled for a receiver. |
| Syntax | <code>show sflow-ports [<ReceiverName *>]</code> |
| Parameter | |
| ReceiverName (optional) | The name of an existing sflow receiver in the domain. A receiver name of "*" displays ports of all the receivers. |
| Examples | |
| | <pre>->show sflow-ports</pre> Displays the sflow sample and polling ports |
| | <pre>->show sflow-ports Alpha</pre> Displays the Alpha sflow port |

sflow-receiver

Configure the receivers.

Supported actions: add, help, remove, set, show

| Item | Description |
|---------------------------------|--|
| <code>add sflow-receiver</code> | Add a receiver. |
| Syntax | <pre>add sflow-receiver <ReceiverName> IpAddress=<IpAddress>[Port= <1-65535>] [MaxHeaderSize=<128 256 512 1024>] [MaxDatagramSize=<256-1500>]</pre> |
| Parameter | |
| ReceiverName (required) | Specifies the unique name of the receiver. A valid receiver name can have a minimum of one character and maximum of 64 characters. Only alphanumeric characters, -(hyphen), and _(underscore) are allowed. White spaces are not allowed. |
| Properties | |

| Item | Description |
|----------------------------|---|
| IpAddress (required) | Specifies the IP Address of the receiver where the sflow datagrams are sent |
| Port (optional) | Specifies the UDP port number of the receiver where the sflow datagrams are sent. The valid range is from 1 to 65535. The default value is "6343". |
| MaxHeaderSize (optional) | Specifies the maximum number of bytes that are copied from a sampled packet to create a flow sample. Valid values are "128", "256", "512", and "1024". The default value is "128". |
| MaxDatagramSize (optional) | Specifies the maximum number of data bytes that are sent in a single datagram. The valid range is from 256 to 1500. The default value is "1400". The MaxDatagramSize must be greater than or equal to the MaxHeaderSize plus 128 bytes of fixed header of an sflow datagram. |
| Examples | |
| | ->add sflow-receiver Alpha ipaddress=10.10.2.22 port=6343 maxheadersize=256 maxdatagramsize=1400 Adds the Alpha sflow receiver |

| Item | Description |
|-------------------------|---|
| remove sflow-receiver | Remove a receiver. |
| Syntax | remove sflow-receiver <ReceiverName *> |
| Parameter | |
| ReceiverName (required) | The name of an existing sflow receiver in the domain. A receiver name of "*" removes all the receivers. |
| Example | |
| | ->remove sflow-receiver Alpha Removes the Alpha sflow receiver |
| | ->remove sflow-receiver * Removes all sflow receivers |

| Item | Description |
|----------------------------|---|
| set sflow-receiver | Modify the receiver. |
| Syntax | set sflow-receiver <ReceiverName *> [IpAddress=<IpAddress>] [Port= <1-65535>] [MaxHeaderSize=<128 256 512 1024>] [MaxDatagramSize=<256-1500>] [Enabled=<true false>] |
| Parameters | |
| ReceiverName (required) | The name of an existing sflow receiver in the domain |
| Properties | |
| IpAddress (optional) | Specifies the IP Address of the receiver where the sflow datagrams are sent. |
| Port (optional) | Specifies the UDP port number of the receiver where the sflow datagrams are sent. The valid range is from 1 to 65535. The default value is "6343". |
| MaxHeaderSize (optional) | Specifies the maximum number of bytes that are copied from a sampled packet to create a flow sample. Valid values are "128", "256", "512", and "1024". The default value is "128". |
| MaxDatagramSize (optional) | Specifies the maximum number of data bytes that are sent in a single datagram. The valid range is from 256 to 1500. The default value is "1400". The MaxDatagramSize must be greater than or equal to the MaxHeaderSize plus 128 bytes of fixed header of an sflow datagram. |
| Enabled (optional) | Enables or disables the sFlow receiver. Valid values are "true" and "false". The default value is "true". |
| Examples | |

| Item | Description |
|------|---|
| | ->set sflow-receiver Alpha enabled=true Enables the Alpha sflow receiver |

| Item | Description |
|-------------------------|--|
| show sflow-receiver | Display the receiver name. |
| Syntax | show sflow-receiver [<ReceiverName *>] |
| Parameter | |
| ReceiverName (optional) | The name of an existing sflow receiver in the domain. A receiver name of "*" displays all the receivers. |
| Examples | |
| | ->show sflow-receiver Displays the sflow receiver |

snmp

Configure and display the SNMP settings for the VC domain.

NOTE: If FIPS mode is enabled for the domain, SNMPv3 is enabled as the default SNMP version. SNMPv1 and SNMPv2 are disabled, and traps for these versions cannot be added. The security level for an SNMPv3 trap or inform must be set to AUTHPRIV.

To configure or display SNMP traps, see the SNMP-trap command ("[snmp-trap](#)" on page [118](#)).

To configure or display SNMP users, see the SNMP-user command ("[snmp-user](#)" on page [122](#)).

Supported actions: set, show, help

| Item | Description |
|--------------------------|--|
| set snmp | Configure the community string, contact information, or version. |
| Syntax | set snmp <Type> [ReadCommunity=<ReadCommunityString>] [SystemContact=<SystemContact>] [Enabled=<true false>] [EnableV1V2=<true false>] [EnableV3=<true false>] [SmisEnabled=<true false>] |
| Parameter | |
| Type (required) | Indicates which SNMP configuration to modify. Valid values include "Enet" and "FC". |
| Properties | |
| ReadCommunity (optional) | Read-Only Community String for the SNMP configuration. The default value is "public". If the type is "Enet", the maximum length of the read community string is 39 characters. If the type is FC, the maximum length is 12 characters. |
| SystemContact (optional) | SNMP system contact information. |
| Enabled (optional) | Enables or disables the SNMP agent. The default value is "true". Valid values include "true" or "false". This property is overridden by the EnableV1V2 property. |
| EnableV1V2 (optional) | Enables or disables SNMPv1 and SNMPv2 for VC-Enet modules. The default value is "true". Valid values include: "true" or "false". |
| EnableV3 (optional) | Enables or disables SNMPv3 for VC-Enet modules. The default value is "false". Valid values include: "true" or "false". When the domain is in FIPS mode, SNMPv1 and SNMPv2 are disabled and cannot be configured. |

| Item | Description |
|------------------------|--|
| SmisEnabled (optional) | Enables or disables SMI-S. This property is valid only for VC-FC modules. The default value is "false". Valid values include "true" or "false". |
| Examples | |
| | ->set snmp enet ReadCommunity=mydatacenter1 SystemContact=admin@datacenter1.com Enabled=true Enables the SNMP agent for VC-Enet modules and supplies a community string. |
| | ->set snmp fc ReadCommunity=mydatacenter SystemContact=FcAdmin Enabled=true Enables the SNMP agent for VC-FC modules |
| | ->set snmp enet EnableV1V2=false Disables SNMPv1 and SNMPv2 for VC-Enet modules |
| | ->set snmp fc EnableV1V2=false Disables SNMPv1 and SNMPv2 for VC-FC modules |
| | ->set snmp enet EnableV3=false Disables SNMPv3 for VC-Enet modules |

| Item | Description |
|------------------|---|
| show snmp | Display the SNMP configuration settings for the VC domain. |
| Syntax | show snmp [Type] |
| Parameter | |
| Type (optional) | Indicates the type of SNMP configuration to display. If the type is not specified, all VC SNMP configuration information appears. Valid values include "Enet" and "FC". |
| Examples | |
| | ->show snmp Enet Displays SNMP configuration for Enet only |
| | ->show snmp FC Displays SNMP configuration for VC-FC modules only |
| | ->show snmp Displays SNMP configuration for all modules |

snmp-access

Manage SNMP access.

Supported actions: add, help, remove, show

| Item | Description |
|--------------------|---|
| add snmp-access | Add new ranges of IP addresses that will be permitted to access VC Ethernet modules through the SNMP interface. |
| Syntax | add snmp-access Network=<IP Address/Netmask Bits> |
| Parameter | |
| Network (required) | The network IP address in the format IP Address/Netmask Bits. The IP address must be unique and the starting address of an IP subnet range. |
| Example | |
| | ->add snmp-access Network=192.168.0.0/24 ->add snmp-access Network=2001::1/64 Adds a new range(s) of IP addresses |

| Item | Description |
|--------------------|--|
| remove snmp-access | Remove already configured range(s) of IP addresses that were permitted to access VC Ethernet modules through the SNMP interface. |
| Syntax | remove snmp-access Network=<IP Address> * |
| Parameter | |
| Network (required) | The network IP address of a configured SNMP access |
| Examples | |
| | ->remove snmp-access Network=192.168.0.0 ->remove snmp-access Network=2001::1 Removes a range(s) of IP addresses |
| | ->remove snmp-access * Removes all configured ranges of IP addresses |

| Item | Description |
|------------------|--|
| show snmp-access | Display the ranges of IP addresses that are already configured to access VC Ethernet modules using the SNMP interface. |
| Syntax | show snmp-access |
| Example | |
| | ->show snmp-access Displays all configured ranges of IP addresses |

snmp-trap

Manage SNMP trap information.

Supported actions: add, help, remove, set, show, test

| Item | Description |
|--------------------|--|
| add snmp-trap | Add a new SNMP trap destination. You can configure up to five VC-Enet and five VC-FC SNMP trap destinations. Avoid using duplicate trap destinations. Setting duplicate trap destinations can result in duplicate traps being sent to the same destination, or only one of the trap destinations being configured. |
| Syntax | add snmp-trap <Name> Address=<IPAddress DNSname> [Port=<1-65535>] [Community=<community name string>] [Format=<SNMPv1 SNMPv2 SNMPv3>] [Severity=<trap severity All None>] [DomainCategories=<domain trap category All None>] [EnetCategories=<enet trap category All None>] [FcCategories=<fc trap category All None>] [UserName=<SNMPv3 username>] [EngineId=<EngineId>] [SecurityLevel=<NOAUTHNOPRIV AUTHNOPRIV AUTHPRIV>] [Inform=<true false>] |
| Parameter | |
| Name (required) | A unique name for the new trap being added |
| Properties | |
| Address (required) | IP address or DNS name for the trap destination |
| Port (optional) | The destination port to send the SNMP trap. Valid values include: 1 to 65535. The default value is port 162. |

| Item | Description |
|--------------------------|---|
| Community (optional) | The SNMP community name string for the specified trap. If not specified, the default value is "public". For VC-Enet modules, the maximum string length is 39. For VC-FC modules, the maximum string length is 24. Community strings are not added when the Format property is set to SNMPv3. |
| Format | Format of the new trap. Values are SNMPv1, SNMPv2, or SNMPv3. If not specified, the default is "SNMPv1". |
| Severity | Trap severities to send to the destination. Values are "Normal", "Unknown", "Info", "Warning", "Minor", "Major", "Critical", "All", and "None". Multiple severities can be specified, separated by commas. The default severity is "None". |
| DomainCategories | The VC domain trap categories to send to the destination. Values are "Legacy", "DomainStatus", "NetworkStatus", "FabricStatus", "ProfileStatus", "ServerStatus", "EnetStatus", "FcStatus", "All", and "None". Multiple categories can be specified, separated by commas. |
| EnetCategories | The VC Ethernet trap categories to send to the destination. Values are "PortStatus", "PortThreshold", "Other", "All", and "None". Multiple categories can be specified, separated by commas. |
| FcCategories | The VC Fibre Channel trap categories to send to the destination. Values are "PortStatus", "Other", "All", and "None". Multiple categories can be specified, separated by commas. |
| UserName (optional) | The name of an existing SNMPv3 user account to be used to send the trap or inform. This property is required if the Format is SNMPv3. This property must not be specified if the Format is SNMPv1 or SNMPv2. |
| EngineID (optional) | The engineID of the remote user. Engine IDs consist of the prefix '0x' and an even number of up to 64 hexadecimal digits. If not specified, then UserName is considered a local SNMPv3 user. This property must be specified if Inform=true. This property must not be specified if Inform=false or the Format is SNMPv1 or SNMPv2. |
| SecurityLevel (optional) | Security level used to send trap/inform. The default is NOAUTHNOPRIV. <ul style="list-style-type: none"> • NOAUTHNOPRIV — No authorization or encryption • AUTHNOPRIV — Authorization but no encryption • AUTHPRIV — Authorization and encryption When the domain is in FIPS mode, the security level must be set to AUTHPRIV. This property is not required if the Format is set to SNMPv1 or SNMPv2. |
| Inform (optional) | Indicates if the trap is an inform. The default value is "false". This property must not be specified if the Format is SNMPv1 or SNMPv2. |
| Examples | |
| | ->add snmp-trap EnetManagementStation Address=192.112.34.10 Community=private Format=SNMPv1 Severity=Normal,Critical EnetCategories=Other Adds a new trap destination for VC-Enet modules |
| | ->add snmp-trap FcManagementStation Address=192.112.72.3 Community=private Format=SNMPv1 FcCategories=Other Adds a new trap destination for VC-FC modules |
| | ->add snmp-trap MyTrap Address=192.112.66.12 Adds a new trap using typical defaults |
| | ->add snmp-trap MyTrap Address=2001:05c0:9168::1 Severity=All EnetCategories=All Adds a new trap destination using an IPv6 address |

| Item | Description |
|------|---|
| | ->add snmp-trap MyTrap Address=192.112.42.5 Severity=All FcCategories=All DomainCategories=All Adds a trap with all severity and category properties set. Severities are allowed even though FC categories are set, but the severities are applied to the domain categories. |
| | ->add snmp-trap trap1 address=10.10.2.86 Format=SNMPv3 Severity=All EnetCategories=All UserName=theta SecurityLevel=AUTHNOPRIV Adds an SNMPv3 trap |
| | ->add snmp-trap trap2 address=10.10.2.92 Format=SNMPv3 Severity=All EnetCategories=All UserName=alpha EngineId=0x33d45ffeed3f SecurityLevel=AUTHPRIV Inform=true Adds an SNMPv3 inform |
| | ->add snmp-trap trap3 address=10.10.2.86 Port=4040 Format=SNMPv3 Severity=All EnetCategories=All UserName=theta SecurityLevel=AUTHNOPRIV Adds an SNMP trap with a non-default port |

| Item | Description |
|------------------|--|
| remove snmp-trap | Remove a previously configured SNMP trap destination. |
| Syntax | remove snmp-trap <Name *> |
| Parameter | |
| Name (required) | The name of the trap destination to be removed. Use "*" to remove all traps. |
| Examples | |
| | ->remove snmp-trap MyTrap1 Removes an SNMP trap destination |
| | ->remove snmp-trap * Removes all configured SNMP trap destinations |

| Item | Description |
|----------------------|---|
| set snmp-trap | Modify an existing SNMP trap destination. |
| Syntax | set snmp-trap <TrapName> [Name=<trap destination name>] [Address=<IPAddress DNSname>] [Port=<1-65535>] [Community=<community name string>] [Format=<SNMPv1 SNMPv2 SNMPv3>] [Severity=<trap severity All None>] [DomainCategories=<domain trap category All None>] [EnetCategories=<enet trap category All None>] [FcCategories=<fc trap category All None>] [UserName=<SNMPv3 username>] [EngineId=<EngineId>] [SecurityLevel=<NOAUTHNOPRIV AUTHNOPRIV AUTHPRIV>] [Inform=<true false>] |
| Parameter | |
| TrapName (required) | The name of the trap to be modified |
| Properties | |
| Name | New name of the trap |
| Address (required) | IP address or DNS name for the trap destination |
| Port (optional) | The destination port to send the SNMP trap. Valid values include: 1 to 65535. The default value is port 162. |
| Community (optional) | The SNMP community name string for the specified trap. If not specified, the default value is "public". For VC-Enet modules, the maximum string length is 39. For VC-FC modules, the maximum string length is 24. Community strings are not added when the Format property is set to SNMPv3. |

| Item | Description |
|--------------------------|---|
| Format | Format of the new trap. Values are SNMPv1, SNMPv2, or SNMPv3. |
| Severity | Trap severities to send to the destination. Values are "Normal", "Unknown", "Info", "Warning", "Minor", "Major", "Critical", "All", and "None". Multiple severities can be specified, separated by commas. The default severity is "None". |
| DomainCategories | The VC domain trap categories to send to the destination. Values are "Legacy", "DomainStatus", "NetworkStatus", "FabricStatus", "ProfileStatus", "ServerStatus", "EnetStatus", "FcStatus", "All", and "None". Multiple categories can be specified, separated by commas. |
| EnetCategories | The VC Ethernet trap categories to send to the destination. Values are "PortStatus", "PortThreshold", "Other", "All", and "None". Multiple categories can be specified, separated by commas. |
| FcCategories | The VC Fibre Channel trap categories to send to the destination. Values are "PortStatus", "Other", "All", and "None". Multiple categories can be specified, separated by commas. |
| UserName (optional) | The name of an existing SNMPv3 user account to be used to send the trap or inform. This property is required if the Format is SNMPv3. This property must not be specified if the Format is SNMPv1 or SNMPv2. |
| EngineID (optional) | The engineID of the remote user. Engine IDs consist of the prefix '0x' and an even number of up to 64 hexadecimal digits. If not specified, then UserName is considered a local SNMPv3 user. This property must be specified if Inform=true. This property must not be specified if Inform=false or the Format is SNMPv1 or SNMPv2. |
| SecurityLevel (optional) | Security level used to send trap/inform. The default is NOAUTHNOPRIV. <ul style="list-style-type: none"> NOAUTHNOPRIV — No authorization or encryption AUTHNOPRIV — Authorization but no encryption AUTHPRIV — Authorization and encryption When the domain is in FIPS mode, the security level must be set to AUTHPRIV. This property is not required if the Format is set to SNMPv1 or SNMPv2. |
| Inform (optional) | Indicates if the trap is an inform. The default value is "false". This property must not be specified if the Format is SNMPv1 or SNMPv2. |
| Examples | |
| | ->set snmp-trap MyTrap1 Community=public Sets the trap community |
| | ->set snmp-trap MyTrap1 Severity=All FcCategories=None EnetCategories=None Sets all trap severities and sets the Fibre Channel and Ethernet categories to none |
| | ->set snmp-trap MyTrap Address=fe80:0000:0000:0000:0202:b3ff:fe1e:8329 Sets a trap using an IPv6 address |
| | ->set snmp-trap MyTrap1 Format=SNMPv3 UserName=theta SecurityLevel=AUTHNOPRIV Sets the username and security level of an SNMPv3 trap. |
| | ->set snmp-trap MyInform1 Format=SNMPv3 UserName=zomato EngineId=0x44fec55438f SecurityLevel=AUTHNOPRIV Inform=true Sets the username, engine ID and security level of an SNMPv3 inform. |
| Item | Description |
| ->show snmp-trap | Display the SNMP traps that have been configured. |
| Syntax | show snmp-trap [Name *] |

| Item | Description |
|------------------|--|
| Parameter | |
| Name (optional) | The name of the trap configuration to be displayed. If no trap name is specified, or "*" is entered, all configured traps are displayed. |
| Examples | |
| | ->show snmp-trap MyTrap1 Displays the SNMP trap configuration for a single trap |
| | ->show snmp-trap * Displays all configured SNMP traps |

| Item | Description |
|------------------|--|
| ->test snmp-trap | Generate an SNMP test trap and sends it to all configured destinations. Traps participating in the test must be configured, at a minimum, with the following attributes: DomainCategories=DomainStatus Severity=Info |
| Syntax | test snmp-trap |
| Example | ->test snmp-trap Generates an SNMP test trap and sends it to the configured destinations |

snmp-user

Configure SNMPv3 users for VC-Enet modules.

Supported actions: add, set, show, remove, help

| Item | Description |
|---------------------------|--|
| add snmp-user | Add a new SNMP user to the domain. VCM supports 16 SNMP users per domain. |
| Syntax | add snmp-user <Name> [AuthAlgo=<MD5 SHA1> AuthPassPhrase=<Passphrase>] [PrivAlgo=<DES AES128> [PrivPassPhrase=<Passphrase>] [EngineId=<EngineId> MinSecurityLevel=<NOAUTHNOPRIV AUTHNOPRIV AUTHPRIV>] |
| Parameter | |
| Name (required) | A unique name for the SNMP user. Valid characters include alphanumeric, '_', and '-'. The maximum length of the name is 31 characters. |
| Properties | |
| AuthAlgo (optional) | Use MD5 or SHA1 algorithm to encode the authorization passphrase. Valid values are MD5 or SHA1. This property is required if either PrivAlgo is specified or SecurityLevel is AUTHNOPRIV or AUTHPRIV. When the domain is in FIPS mode, the AuthAlgo must be set to SHA1. |
| AuthPassPhrase (optional) | Authorization passphrase used to sign operations. Must be between 8 characters and 31 characters in length. This property is required if AuthAlgo is specified. |
| PrivAlgo (optional) | Use DES or AES128 algorithm to encode the SNMP messages. Valid values are DES or AES128. This property is required if SecurityLevel is AUTHPRIV. When the domain is in FIPS mode, the PrivAlgo must be set to AES128. |
| PrivPassPhrase (optional) | Privacy passphrase used to encrypt operations. Must be between 8 characters and 31 characters in length. If not specified, the authorization passphrase will be used. |
| EngineId (optional) | The engine ID of the remote SNMP user account. The EngineId consists of the prefix |

| Item | Description |
|-----------------------------|--|
| | '0x' and is followed by an even number of digits, up to 64 hexadecimal. The property is only used for adding remote SNMP users. |
| MinSecurityLevel (optional) | <p>Minimal level of security required for operation.</p> <ul style="list-style-type: none"> • NOAUTHNOPRIV allows for unauthenticated and unencrypted operations. • AUTHNOPRIV requires only authentication. • AUTHPRIV requires authentication and encryption. <p>The default is NOAUTHNOPRIV. This property is applicable only to local SNMP user accounts.</p> <p>When the domain is in FIPS mode, the MinSecurityLevel must be set to AUTHPRIV.</p> |
| Examples | |
| | <pre>->add snmp-user alpha</pre> <p>Adds a local SNMP user with the default MinSecurityLevel.</p> |
| | <pre>->add snmp-user delta EngineId=0x44fec55438f</pre> <p>Adds a remote SNMP user.</p> |
| | <pre>->add snmp-user theta AuthAlgo=SHA1 AuthPassPhrase=bellerophone PrivAlgo=AES128 MinSecurityLevel=AUTHPRIV</pre> <p>Adds a local SNMP user with AuthAlgo and PrivAlgo specified.</p> |
| | <pre>->add snmp-user beta AuthAlgo=SHA1 AuthPassPhrase=bellerophone PrivAlgo=AES128 PrivPassPhrase=armageddon EngineId=0x44fec55438f</pre> <p>Adds a new remote SNMP user with AuthAlgo and PrivAlgo specified.</p> |

| Item | Description |
|-----------------------------|--|
| set snmp-user | Modify an existing SNMP user profile. |
| Syntax | <pre>set snmp-user <Name> [AuthAlgo=<MD5 SHA1 None> AuthPassPhrase=<Passphrase>] [PrivAlgo=<DES AES128 None> PrivPassPhrase=<Passphrase>] [EngineId=<EngineId> MinSecurityLevel=<NOAUTHNOPRIV AUTHNOPRIV AUTHPRIV>]</pre> |
| Parameter | |
| Name (required) | The name of the existing SNMP user to be modified |
| AuthAlgo (optional) | <p>Use MD5 or SHA1 algorithm to encode the authorization passphrase. This property is required if either PrivAlgo is specified or SecurityLevel is AUTHNOPRIV or AUTHPRIV.</p> <p>Specifying 'None' clears the AuthAlgo and AuthPassPhrase.</p> |
| AuthPassPhrase (optional) | Authorization passphrase used to sign operations. Must be between 8 characters and 31 characters in length. This property is required if AuthAlgo is specified. |
| PrivAlgo (optional) | <p>Use DES or AES128 algorithm to encode the SNMP messages. This property is required if SecurityLevel is AUTHPRIV.</p> <p>Specifying 'None' clears the PrivAlgo and PrivPassPhrase.</p> |
| PrivPassPhrase (optional) | Privacy passphrase used to encrypt operations. Must be between 8 characters and 31 characters in length. If not specified, the authorization passphrase will be used. |
| EngineId (optional) | The engine ID of the remote SNMP user account. The EngineId consists of the prefix '0x' and is followed by an even number of digits, up to 64 hexadecimal. The property is only used for adding remote SNMP users. |
| MinSecurityLevel (optional) | <p>Minimal level of security required for operation.</p> <ul style="list-style-type: none"> • NOAUTHNOPRIV allows for unauthenticated and unencrypted operations. • AUTHNOPRIV requires only authentication. • AUTHPRIV requires authentication and encryption. <p>The default is NOAUTHNOPRIV. This property is applicable only to local SNMP user accounts.</p> |

| Item | Description |
|-----------------|---|
| Examples | |
| | <pre>->set snmp-user theta AuthAlgo=MD5 AuthPassPhrase=bellerophone PrivAlgo=DES PrivPassPhrase=armageddon MinSecurityLevel=AUTHPRIV</pre> Modifies the MinSecurityLevel, AuthAlgo, and PrivAlgo properties for a local SNMP user account. |
| | <pre>->set snmp-user beta AuthAlgo=MD5 AuthPassPhrase=bellerophone PrivAlgo=DES PrivPassPhrase=armageddon EngineId=0x44fec55438f</pre> Modifies the AuthAlgo and PrivAlgo for the remote SNMP user account. |

| Item | Description |
|---------------------|---|
| show snmp-user | Display existing SNMP user settings. |
| Syntax | show snmp-user [<Name> *][EngineId=EngineId *] |
| Parameter | |
| Name (optional) | The name of the existing SNMP user to be displayed |
| Properties | |
| EngineId (optional) | The engine ID of the remote SNMP user account. The EngineId consists of the prefix '0x' and is followed by an even number of digits, up to 64 hexadecimal. If '*' is specified, then all remote SNMP users are displayed. |
| Examples | |
| | <pre>->show snmp-user alpha</pre> Displays the local SNMP user |
| | <pre>->show snmp-user *</pre> Displays all local SNMP users |
| | <pre>->show snmp-user beta EngineId=0x44fec55438f</pre> Displays the remote SNMP user with matching name and engine ID |
| | <pre>->show snmp-user delta EngineId=*</pre> Displays the remote SNMP users with matching name |
| | <pre>->show snmp-user EngineId=0x44fec55438f ->show snmp-user * EngineId=0x44fec55438f</pre> Displays all remote SNMP users with matching engine ID |
| | <pre>->show snmp-user EngineId=*</pre> Displays all remote SNMP users |
| | <pre>->show snmp-user ->show snmp-user * EngineId=*</pre> Displays all local and remote SNMP users |

| Item | Description |
|---------------------|--|
| remove snmp-user | Remove an existing SNMP user from the domain |
| Syntax | remove snmp-user [<Name *>][EngineId=<EngineId *>] |
| Parameter | |
| Name (required) | The name of the SNMP user to be removed. If "*" is specified, all local or remote users are removed. |
| Properties | |
| EngineId (optional) | The engine ID of the remote SNMP user account. The EngineId consists of the prefix '0x' and is followed by an even number of digits, up to 64 hexadecimal. If '*' is specified, then all remote SNMP users are removed based on the value of the <Name> parameter. |
| Examples | |

| Item | Description |
|------|--|
| | ->remove snmp-user alpha Removes a local SNMP user with a specified name |
| | ->remove snmp-user * Removes all local SNMP users |
| | ->remove snmp-user beta EngineId=0x44fec55438f Removes a remote SNMP user with the specified name |
| | ->remove snmp-user delta EngineId=* Removes all remote SNMP users with specified name |
| | ->remove snmp-user EngineId=0x44fec55438f ->remove snmp-user * EngineId=0x44fec55438f Removes all remote SNMP users with specified engine ID |
| | ->remove snmp-user EngineId=* Removes all remote SNMP users |
| | ->remove snmp-user * EngineId=* Removes all local and remote SNMP users |

ssh

Manage SSH configuration and information.

Supported actions: help, load, remove, show

| Item | Description |
|------------------------|---|
| load ssh | Transfer the SSH key from a remote FTP or SFTP server and apply it to the VC domain. A customized SSH key enables additional security for SSH clients that are allowed to access the domain configuration. If a new custom SSH key is applied, the SSH clients must be configured correctly to have access. This command loads an SSH key for the current user only. Other VC users are not able to use the same SSH key to authenticate. This command is only valid for local VC users, not LDAP, TACACS+, or RADIUS users. |
| Syntax | load ssh Address=<ftp://user:password@IPaddress/filename> -or- load ssh Address=<ftp://user:password@IPaddress> Filename=<name> |
| Properties | |
| Address (required) | The IP address or host name of the FTP or SFTP server, with user name, password, and remote file containing the SSH keys to transfer. Be sure to add brackets when using an IPv6 address. |
| Filename (required) | The name of the remote file containing the SSH keys to transfer. The filename can also be mentioned separately. The file path given will be treated as relative to the login directory for the user on the server. The user should ensure that the permissions are appropriate for the transfer to succeed. |
| Examples | |
| | ->load ssh Address=ftp://user:password@192.168.10.12/ ssh_key.pub Transfers the SSH key from the remote FTP server |
| | ->load ssh Address=ftp://user:password@192.168.10.12 Filename=/ssh_key.pub Transfers the SSH key from the remote FTP server |
| | ->load ssh address=ftp://user:password@[2001:1::1]/ssh_key.pub Transfers the SSH key from the remote FTP server using an IPv6 address |

| Item | Description |
|------|---|
| | ->load ssh address=ftp://user:password@[2001:1::1] filename=/ssh_key.pub Transfers the SSH key from the remote FTP server using an IPv6 address |

| Item | Description |
|----------------|--|
| remove ssh | Remove any custom SSH keys that have been applied. |
| Syntax | remove ssh |
| Example | |
| | ->remove ssh Removes SSH keys |

| Item | Description |
|----------------|--|
| show ssh | Display the SSH key configuration. |
| Syntax | show ssh |
| Example | |
| | ->show ssh Displays the SSH key configuration |

ssl-certificate

View and upload the SSL certificate from a remote FTP server.

Supported actions: help, load, show

| Item | Description |
|----------------------|--|
| load ssl-certificate | Transfer an SSL certificate from a remote FTP or SFTP server and apply it to the VCM web server. When renewing certificates, the upload removes any previous Signed Certificate from VCM. You must add a new certificate or update with a renewed certificate in your browser. See browser Help for information on installing or renewing certificates. After a new SSL certificate is applied, the web server resets. |
| Syntax | load ssl-certificate Address=<ftp://user:password@IPAddress/filename> -or- load ssl-certificate Address=<ftp://user:password@ipaddress> Filename=<name> |
| Properties | |
| Address (required) | A valid IP address of the FTP or SFTP server, with user name, password, and name of the SSL certificate file to transfer. Be sure to add brackets when using an IPv6 address. |
| Filename (required) | The name of the SSL certificate file to transfer. The filename can also be mentioned separately. The file path given will be treated as relative to the login directory for the user on the server. The user should ensure that the permissions are appropriate for the transfer to succeed. |
| Examples | |
| | ->load ssl-certificate |

| Item | Description |
|------|--|
| | Address=ftp://user:password@192.168.10.12/my-new-ssl.crt Transfers a new custom SSL certificate from the remote FTP server |
| | ->load ssl-certificate Address=ftp://user:password@192.168.10.12 Filename=my-new-ssl.crt Transfers a new custom SSL Certificate from the remote FTP server |
| | ->load ssl-certificate Address=ftp://user:password@[2001:1::1]/my-new-ssl.crt Transfers a new custom SSL certificate from the remote FTP server using an IPv6 address |
| | ->load ssl-certificate Address=ftp://user:password@[2001:1::1] filename=/my-new-ssl.crt Transfers a new custom SSL certificate from the remote FTP server using an IPv6 address |

| Item | Description |
|----------------------|---|
| show ssl-certificate | Display the VC web server SSL certificate information. Use "*" to display detailed SSL certificate information. |
| Syntax | show ssl-certificate [*] |
| Examples | |
| | ->show ssl-certificate Displays SSL certificate information |
| | ->show ssl-certificate * Displays detailed SSL certificate information |

ssl-csr

Generate and transfer an SSL certificate signing request to a remote FTP or SFTP server.

Supported actions: help, save

| Item | Description |
|---------------|--|
| save ssl-csr | Generate and transfer an SSL certificate signing request to a remote FTP or SFTP server. If the private key size is 1024 bits, then this command upgrades the size to 2048 bits and restarts the VC web server. |
| Syntax | <pre>save ssl-csr [-quiet] address=<ftp://user:password@ipaddress/[filename]> CN=server.domain.com O="Hewlett-Packard" C=US ST=CA L=Cupertino [OU=<value>] [Contact=<value>] [AlternativeName=<value>] [Email=<value>] [Surname=<value>] [GivenName=<value>] [Initials=<value>] [DNQualifier=<value>] [ChallengePW=<value> ConfirmPW=<value>] [UnstructuredName=<value>] -or- save ssl-csr [-quiet] address=<ftp://user:password@ipaddress/> filename=<name> CN=server.domain.com O="Hewlett-Packard" C=US ST=CA L=Cupertino [OU=<value>] [Contact=<value>] [AlternativeName=<value>] [Email=<value>] [Surname=<value>] [GivenName=<value>] [Initials=<value>] [DNQualifier=<value>]</pre> |

| Item | Description |
|---|--|
| | [ChallengePW=<value> ConfirmPW=<value>] [UnstructuredName=<value>] |
| Options | |
| quiet | This option suppresses user confirmation prompts. This option is useful when scripting operations. |
| Properties | |
| Address (required) | A valid IP address of the FTP or SFTP server, with user name, password, and name of the file to which the generated SSL certificate signing request will be stored on the server. If not specified, the default filename is "vc-ssl.csr". |
| Filename (optional if the filename is not in the address) | The name of the file to which the generated SSL certificate signing request will be stored on the FTP or SFTP server. The filename can also be mentioned separately. If not specified, the default filename is "vc-ssl.csr". The file path given will be treated as relative to the login directory for the user on the server. The user should ensure that the permissions are appropriate for the transfer to succeed. |
| C (required if signed certificate is not installed) | The two character code for the country where the VC domain is located. The value must be two alphabetic characters. |
| ST (required if signed certificate is not installed) | The state or province where the VC domain is located. The value can be 1 to 30 characters in length. |
| L (required if signed certificate is not installed) | The city or locality where the VC domain is located. The value can be 1 to 50 characters in length. |
| O (required if signed certificate is not installed) | The company or organization that owns the VC domain. The value can be 1 to 60 characters in length. |
| CN (required if signed certificate is not installed) | The Common Name. This can be a fully qualified domain name (FQDN) for the web server issuing the certificate. To prevent security alerts, the value of this field must match the host name exactly as it is shown in the web browser. For example, if the address shown in the browser is https://vc001635.xyz.com/index.html , then the value for CN must be vc-001635.xyz.com. This value can be 1 to 60 characters in length. |
| OU (optional) | The Organizational Unit. This is the unit within the company or organization that owns the VC module. The value can be 0 to 60 characters in length. |
| Contact (optional) | The person responsible for the VC module. The value can be 0 to 60 characters in length. |
| AlternativeName (optional) | One or more alternate names or addresses for the VC domain, separated by commas. The value can be 0 to 500 characters in length. The default value is the existing data from the certificate plus any IP addresses (and associated DNS names), in the form of DNS:host.domain.com, IP:x.x.x.x, that the domain has configured but are not in the existing certificate. |
| Email (optional) | The email address of the person responsible for the VC domain. The value can be 0 to 60 characters in length. |
| Surname (optional) | The surname of the person responsible for the VC domain. The value can be 0 to 60 characters in length. |
| GivenName (optional) | The given name of the person responsible for the VC domain. The value can be 0 to 60 characters in length. |
| Initials (optional) | The initials of the person responsible for the VC domain. The value can be 0 to 20 characters in length. |

| Item | Description |
|-----------------------------|--|
| DNQualifier (optional) | The distinguished name qualifier for the VCM. The value can be 0 to 60 characters in length. Acceptable characters are alphanumeric, space, and the following punctuation marks: ' () + , - . / : = ? |
| ChallengePW (optional) | The password for the certificate-signing request. The value can be 0 to 30 characters in length. If an empty password is specified, the user is prompted for the value. |
| ConfirmPW (optional) | Confirm the challenge password. The value can be 0 to 30 characters in length. If an empty password is specified, the user is prompted for the value. |
| UnstructuredName (optional) | This is for additional information. The value can be 0 to 60 characters in length. |
| Examples | |
| | <pre>->save ssl-csr address=ftp://user:password@192.168.10.12 CN=server.domain.com O="Hewlett Packard" C=US ST=CA L=Cupertino ->save ssl-csr address=ftp://user:password@[2001:1::1] CN=server.domain.com O="Hewlett Packard" C=US ST=CA L=Cupertino</pre> <p>Generates and transfers an SSL certificate signing request to the remote FTP server</p> |
| | <pre>->save ssl-csr address=ftp://user:password@192.168.10.12/ filename=/new-ssl.csr CN=server.domain.com O="Hewlett-Packard" C=US ST=CA L=Cupertino email=vc-admin@domain.com ->save ssl-csr address=ftp://user:password@[2001:1::1]/ filename=/new-ssl.csr CN=server.domain.com O="Hewlett-Packard" C=US ST=CA L=Cupertino email=vc-admin@domain.com</pre> <p>Generates and transfers an SSL certificate signing request and saves with a new filename</p> |
| | <pre>->save ssl-csr address=ftp://user:password@192.168.10.12/new-ssl.csr CN=server.domain.com O="Hewlett-Packard" C=US ST=CA L=Cupertino email=vc-admin@domain.com ->save ssl-csr address=ftp://user:password@[2001:1::1]/new-ssl.csr CN=server.domain.com O="Hewlett-Packard" C=US ST=CA L=Cupertino email=vc-admin@domain.com</pre> <p>Generates and transfers an SSL certificate signing request and saves with a new filename</p> |

ssl

Allow or disallow SSL encryption (browser/SOAP).

Supported actions: set, show, help

| Item | Description |
|---------------|---|
| set ssl | Allow modifications to be made to the SSL configuration, and enable or disable string encryption for SSL communication with the web server. |
| Syntax | set ssl Strength=[<All Strong>] |

| Item | Description |
|---------------------|--|
| Option | |
| quiet (optional) | This option suppresses user confirmation prompts. This option is useful for scripting ssl operations. |
| Property | |
| Strength (required) | The strength of the encryption cipher. Valid values include "All" and "Strong". The default value is "Strong". The SSL strength cannot be changed when the domain is in FIPS mode. |
| TLS (optional) | Select TLS version: <ul style="list-style-type: none"> • All—Allows TLSv1, TLSv1.1, and TLSv1.2. • Strict—Allows TLSv1.2 only. The default value is 'Strict'. TLS is only available when the domain is in FIPS mode. |
| Examples | |
| | ->set ssl Strength=strong Enables strong SSL encryption |
| | ->set ssl Strength=all Enables default SSL encryption settings |
| | ->set ssl TLS=all Allows TLSv1, TLSv1.1, and TLSv1.2 encryption when the domain is in FIPS mode. |
| | ->set ssl -quiet Strength=strong Enables strong SSL encryption without user confirmation prompts |

| Item | Description |
|----------------|--|
| show ssl | Display SSL configuration TLS configuration is displayed when the domain is in FIPS mode. |
| Syntax | show ssl |
| Example | |
| | ->show ssl Displays SSL current configuration |

stackinglink

Manage and display the stacking link information.

Observe the following information:

- Double-dense mode is not supported.
- The HP c3000 enclosure is not supported.
- VC Fibre Channel modules are not supported.
- When adding a network and this feature is enabled, Smart Link is also enabled.
- A network outage occurs when configuring the domain stacking link mode.

Supported actions: help, set, show

| Item | Description |
|------------------|---|
| set stackinglink | Configure the domain stacking link. |
| Syntax | set stackinglink [-quiet] DomainStackingMode=<Full Primary-Slice Horizontal> |

| Item | Description |
|-------------------------------|---|
| Options | |
| quiet | This option suppresses user confirmation prompts. This option is useful when scripting operations. |
| Property | |
| DomainStackingMode (required) | Specifies one of three stacking modes for the domain: <ul style="list-style-type: none"> • Full—Default stacking mode. All FlexFabric and Ethernet modules are interconnected. • Horizontal—Disables all vertical stacking links. • Primary-Slice—Disables all stacking links outside of the primary slice. The primary slice is the primary and standby interconnect modules for the enclosure. |
| Example | ->set stackinglink DomainStackingMode=Primary-Slice Configures the primary slice stacking mode. |

| Item | Description |
|-------------------|---|
| show stackinglink | Display the status, stacking mode, and summary information of stacking links. |
| Syntax | show stackinglink |
| Example | ->show stackinglink Displays the status, stacking mode, and summary information of stacking links. |

statistics

Manage statistics for interconnect module ports.

Supported actions: help, reset, show

| Item | Description |
|-------------------|---|
| reset statistics | Reset per-port statistics for the specified port ID and its associated subports. |
| Syntax | reset statistics <PortID> |
| Parameter | |
| PortID (required) | The port ID on which to reset statistics. The port ID is in the format <EnclosureID>:<BayNumber>:<PortLabel>. For QSFP+ ports, the <PortLabel> format is Q<x>.<y>. A listing of the possible uplink port IDs can be obtained by using the show uplinkport command. |
| Examples | |
| | ->reset statistics enc0:3:X1 Resets the statistics for uplink port X1 on the interconnect module in bay 3 of the local enclosure |
| | ->reset statistics enc0:1:Q1.1 Resets the statistics for QSFP+ uplink port Q1.1 on the interconnect module in bay 1 of the local enclosure |
| | ->reset statistics enc0:1:d3 Resets statistics for downlink port d3 on the Ethernet interconnect module in bay 1 of the local enclosure |

| Item | Description |
|-------------------|---|
| show statistics | Display statistics for the specified physical port, FlexNIC, or the aggregated statistics for the specified LAG. |
| Syntax | show statistics <PortID> <[-summary] <LAGID=<encXX:BayNumber:lagNN> PortID=<encXX:BayNumber:portlabel>>> |
| Parameter | |
| PortID (optional) | <p>The port ID on which to display statistics information. The port ID is in the format:</p> <ul style="list-style-type: none"> • Uplink port—<EnclosureID>:<BayNumber>:<PortLabel> • Downlink port—<EnclosureID>:<BayNumber>:<PortLabel>: [<SubPortLabel>] <p>SubPortLabel for a downlink port is optional.</p> <p>For QSFP+ ports, the <PortLabel> format is Q<x>.<y>.</p> <p>A listing of the possible uplink port IDs can be obtained by using the show uplinkport command.</p> |
| Option | |
| summary | Displays a per port summary for the members of the specified LAG |
| Properties | |
| LAGID (optional) | The LAG ID on which to display statistics information. The LAG ID is in the format <EnclosureID>:<BayNumber>:<LagLabel>. LagLabel must be in the format lagNN, where NN is the LAG number. |
| PortID (optional) | The ID of the port on which to display statistics information. The port ID is in the format <EnclosureID>:<BayNumber>:<PortLabel>. |
| Examples | |
| | <pre>->show statistics enc0:3:X1</pre> <p>Displays statistics for uplink port X1 on interconnect module 3 of the primary enclosure</p> |
| | <pre>->show statistics enc0:1:Q1.1</pre> <p>Displays statistics for QSFP+ uplink port Q1.1 on interconnect module 1 of the primary enclosure</p> |
| | <pre>->show statistics enc0:1:d3</pre> <p>Displays statistics for downlink port d3 on Ethernet interconnect module 1 of the primary enclosure</p> |
| | <pre>->show statistics enc0:1:d1:v1</pre> <p>Displays statistics for subport v1 of downlink port d1 on Ethernet interconnect module 1 of the primary enclosure</p> |
| | <pre>->show statistics PortID=enc0:1:X1</pre> <p>Displays statistics for uplink port X1 on interconnect module 1 of the primary enclosure</p> |
| | <pre>->show statistics -summary LAGID=enc0:1:lag25</pre> <p>Displays aggregated statistics with selected counters for a given LAG ID on interconnect module 1 of the primary enclosure</p> |
| | <pre>->show statistics LAGID=enc0:1:lag25</pre> <p>Displays aggregated statistics for a given LAG ID on interconnect module 1 of the primary enclosure</p> |

In addition to the standard statistics, Virtual Connect also provides additional information on DCBX and QoS.

The QoS statistics are displayed for the specified physical port. The types of QoS statistics are in the format of cosq<N>_<counter>, where <N> is the queue number with values 0-7. The queue number N is based on the egress dot1p priority of the corresponding QoS traffic class. When QoS is not enabled, cosq3 is for FCoE traffic and cosq0 is for regular Ethernet traffic.

The following table lists the types of QoS statistics displayed.

| Item | Description |
|---------------------------|--|
| cosq<N>_ucast_OutBytes | The accumulated transmitted byte count of unicast packets of the queue for the specified port. For VC FlexFabric 10Gb/24-port module and VC Flex-10 Enet module, the counter is not supported and the value is 0. |
| cosq<N>_ucast_OutPkts | The accumulated transmitted packet count of unicast packets of the queue for the specified port. For VC FlexFabric 10Gb/24-port module and VC Flex-10 Enet module, the counter includes both unicast and multicast data. |
| cosq<N>_ucast_DroppedPkts | The accumulated dropped packet count of unicast packet of the queue for the specified port. For VC FlexFabric 10Gb/24-port module and VC Flex-10 Enet module, the counter includes unicast and multicast data. |

DCBX is the data center discovery and capability exchange protocol used by DCB devices to exchange configuration information with directly-connected peers. The protocol can also be used for misconfiguration detection and for configuration of the peer. In this release, the VC module adopts the DCBX specification to implement the control state machine and three feature state machines:

- Priority Group (PG)
- Priority-based Flow Control (PFC)
- Application Protocol (AP)

The following table lists the type of DCBX statistics displayed.

| Item | Description |
|----------------------------------|---|
| DCBX Application Protocol State | <enabled or disabled> |
| DCBX Overall Status | <OK, Failed, Unknown> |
| DCBX Pending Status | <false, true, or negotiating in progress> |
| DCBX Priority Flow Control State | <Status> |
| DCBX Priority Group State | <Status> |
| DCBX Application Protocol State | <Status> |

The following table defines each statistic.

| Item | Description |
|------------------------------|--|
| disabled | The feature is operationally disabled. |
| ok | The feature is configured properly or DCBX negotiation is in progress. |
| incompatible cnfg | A FlexFabric network adapter has an incompatible configuration and is not accepting changes. |
| peer_disabled | A FlexFabric network adapter reports that the feature is not enabled. |
| Does not support dcbx | A FlexFabric network adapter does not indicate that it supports the feature. |
| Not advertising dcbx support | A FlexFabric network adapter is not running DCBX within the expired period. |
| Error during cnfg | A FlexFabric network adapter reported an error configuring the feature. |
| Not accepting changes | A FlexFabric network adapter reported an error configuring the feature. |

statistics-throughput

Manage the port throughput statistics.

Supported actions: help, show, set

| Item | Description |
|--|---|
| show statistics-throughput | Display throughput information for the specified physical port, FlexNIC, and the aggregated throughput information for the specified LAG. |
| Syntax | show statistics-throughput <config PortID> [LAGID=<encXX:BayNumber:lagNN>] |
| Parameters | |
| PortID (optional) | The port ID of the port/subport for which to display throughput information. PortID is composed of <EnclosureID>:<BayNumber>:<PortLabel>[:<SubportLabel>]. For QSFP+ ports, the <PortLabel> format is Q<x>.<y>. Port throughput collection must be enabled for the domain by issuing the set statistics-throughput command. A column that contains an "R" indicates that the statistics were reset by the user during that time period; therefore, the throughput is not available for that time period. |
| config (required if PortID is not specified) | Displays the current configuration of throughput statistics |
| Property | |
| LAGID (optional) | The LAG ID on which to display throughput information. The LAG ID is in the format <EnclosureID>:<BayNumber>:<LagLabel>. LagLabel is in the format lagNN, where NN is the LAG number. A listing of the possible uplink port IDs can be obtained by using the show uplinkport command. |
| Examples | |
| | ->show statistics-throughput enc0:1:X1 Displays the port throughput statistics for port X1 of the module in bay1 of enclosure enc0 |
| | ->show statistics-throughput enc0:1:Q1.1 Displays the port throughput statistics for QSFP+ port Q1.1 of the module in bay 1 of enclosure enc0 |
| | ->show statistics-throughput enc0:1:d1:v1 Displays the subport throughput statistics for subport v1 of port d1 from the module in bay1 of enclosure enc0 |
| | ->show statistics-throughput config Displays the current configuration of the throughput statistics |
| | ->show statistics-throughput LAGID=enc0:1:lag25 Displays the aggregated throughput statistics based on the LAGID 25 for the module in bay1 of enclosure enc0 |

| Item | Description |
|---------------------------|--|
| set statistics-throughput | Enable or disable the port throughput statistics and set the sample rate. |
| Syntax | set statistics-throughput <Enabled=[true false]> [SampleRate=<1m 2m 3m 4m 5m 1h>]> |
| Parameters | |
| Enabled (optional) | Enables or disables port throughput statistics. Valid values include "true" and "false". |
| SampleRate (optional) | Configures the sample rate for statistics collection. Valid values include: <ul style="list-style-type: none"> • Use SampleRate=1m for 1 minute samples, collecting up to 5 hours of samples. • Use SampleRate=2m for 2 minute samples, collecting up to 10 hours of samples. • Use SampleRate=3m for 3 minute samples, collecting up to 15 hours of samples. |

| Item | Description |
|-----------------|---|
| | <ul style="list-style-type: none"> • Use SampleRate=4m for 4 minute samples, collecting up to 20 hours of samples. • Use SampleRate=5m for 5 minute samples, collecting up to 25 hours of samples. • Use SampleRate=1h for 60 minute samples, collecting up to 12.5 days of samples. <p>Port throughput statistics are accessible using the <code>show statistics-throughput</code> command.</p> |
| Examples | |
| | <pre>->set statistics-throughput Enabled=true SampleRate=2m</pre> <p>Enables the port throughput statistics with the sample rate set to 2 minutes</p> |
| | <pre>->set statistics-throughput Enabled=false</pre> <p>Disables the port throughput statistics</p> |

status

View overall domain status information.

Supported actions: help, show

| Item | Description |
|--------------------------|---|
| <code>show status</code> | Display the status of the domain and all components in the domain. |
| Syntax | <code>show status</code> |
| Example | <pre>->show status</pre> <p>Displays domain status information</p> |

storage-management

Manage iSCSI storage management information for P4000 devices.

Supported actions: add, help, remove, set, show

NOTE: The P4000 storage does not support IPv6.

| Item | Description |
|-------------------------------------|---|
| <code>add storage-management</code> | Add iSCSI storage management credentials. |
| Syntax | <code>add storage-management <name> ip=<IPv4Address> username=<user_name> [password=<password>]</code> |
| Parameter | |
| <code>name (required)</code> | The name for the iSCSI storage management |
| Properties | |
| <code>ip (required)</code> | The iSCSI storage management IPv4 address |
| <code>username (required)</code> | An administrator for the storage management |
| <code>password (optional)</code> | The user password. The password can be entered as clear text in the command. If you do not specify the password, you are prompted to enter the password as a masked string at the prompt. |
| Examples | |
| | <pre>->add storage-management SMName ip=16.89.125.10 username=user1 password=pass1</pre> |

| Item | Description |
|------|--|
| | Adds iSCSI storage management records with password entered as clear text |
| | <pre>->add storage-management SMName ip=16.89.125.12 username=user2</pre> Add iSCSI storage management credential with password prompted and entered as a masked string |

| Item | Description |
|------------------------------|---|
| remove storage-management | Delete iSCSI storage management credential records. |
| Syntax | remove storage-management [<name> *] |
| Parameter | |
| name (required) | The name of the storage management information being removed. Use "*" to remove all storage management records. |
| Examples | |
| | <pre>->remove storage-management SMName</pre> Removes the specified storage management records |
| | <pre>->remove storage-management *</pre> Removes all storage management records in the domain |

| Item | Description |
|---------------------------|---|
| set storage-management | Modify the specified iSCSI storage management credential. |
| Syntax | set storage-management <name> [ip=<IPv4Address>] [username=<user_name>] [password=<password>]] |
| Parameter | |
| name (required) | The name for the iSCSI storage management |
| Properties | |
| ip (optional) | The iSCSI storage management IPv4 address |
| username (optional) | An administrator for the storage management |
| password (optional) | The user password. The password can be entered as clear text in the command. If you specify the password property without a value, you are prompted to enter the password as a masked string at the prompt. |
| Examples | |
| | <pre>->set storage-management SMName password=MyPassword</pre> Modifies iSCSI storage management records password with clear text |
| | <pre>->set storage-management SMName password=</pre> Modifies iSCSI storage management credential password (You will be prompted to enter password as a masked string.) |

| Item | Description |
|----------------------------|---|
| show storage-management | Displays storage management information (excluding passwords) in the domain. |
| Syntax | show storage-management [<name> *] |
| Parameter | |
| name (optional) | The name of the existing storage management information in the domain. Use "*" to display detailed information for all storage management records. If no value is specified, a summary of all storage management records appears. |
| Example | |

| Item | Description |
|------|--|
| | ->show storage-management Displays summary information for all storage management records |
| | ->show storage-management SMName Displays details on the specified storage management records |
| | ->show storage-management * Displays details on all storage management records in the domain |

supportinfo

Generate a support information file and send to a remote server using FTP, TFTP, or SFTP.

Supported actions: help, save

| Item | Description |
|--------------------|--|
| save supportinfo | Generate and transfer a Virtual Connect support information file to a remote FTP, TFTP, or SFTP server. |
| Syntax | save supportinfo address=<tftp://ipaddress/[filename] ftp://user:password@ipaddress>/[filename] |
| Options | |
| maskEncryptKey | Specify the encryption key after entering the command. The key string is masked and confirmed. When the domain is in FIPS mode, an encryption key is required. |
| Property | |
| address (required) | A valid IP address of a TFTP or FTP server, with user name, password (where required), and name of the file to which the generated support info will be stored on the FTP server. If not specified, the default file name is "vc-support-info". |
| Examples | |
| | ->save supportinfo address=tftp://192.168.10.12 ->save supportinfo address=tftp://[2001::50] Saves a support information file to a remote TFTP server |
| | ->save supportinfo address=ftp://user:password@192.168.10.12 ->save supportinfo address=ftp://user:password@[2001::50] Saves a support information file to a remote FTP server |
| | ->save supportinfo address=ftp://user:password@192.168.10.12/new-support-info ->save supportinfo address=ftp://user:password@[2001::50]/new-support-info Saves a support information file to a remote FTP server with a user-specified file name |
| | ->save supportinfo address=ftp://user:password@192.168.10.12:2000/new-support-info ->save supportinfo address=ftp://user:password@[2001::50]:2000/new-support-info Saves a support information file to a remote FTP server with a user-specified port number |

systemlog

View the Virtual Connect Manager system event log.

Supported actions: help, show

| Item | Description |
|-----------------|---|
| show systemlog | Display the Virtual Connect Manager system log. |
| Syntax | show systemlog [-Last=<n>] [-First=<n>] [-Pause=<n>] |
| Options | |
| Last | Displays the last n records. If this option is specified and no value is provided, the last 10 records are displayed. |
| First | Displays the first n records. If this option is specified and no value is provided, the first 10 records are displayed. |
| Pause | The number of records to be viewed before prompting for a key press. Valid values include numbers between 1 and 40. |
| Examples | |
| | ->show systemlog Displays the entire system log |
| | ->show systemlog -pause=8 Displays the system log, eight records at a time |
| | ->show systemlog -first=12 Displays the first twelve records from the system log |
| | ->show systemlog -last=8 Displays the last eight records from the system log |
| | ->show systemlog -last=20 -pause=6 Displays the last twenty records from the system log, six records at a time |

To add a remote target, see "add log-target (on page 66)."

tacacs

Manage TACACS+ authentication settings.

Supported actions: help, set, show

| Item | Description |
|--------------------------|---|
| set tacacs | Modify and test the Virtual Connect TACACS+ authentication settings. |
| Syntax | set tacacs [-test] [Enabled=<true false>] [ServerAddress=<IP Address DNS Name>] [Port=<portNum>] [ServerKey=<key>] [Timeout=<timeout>] [SecondaryServerAddress=<IP Address DNS Name>] [SecondaryPort=<portNum>] [SecondaryServerKey=<key>] [SecondaryTimeout=<timeout>] [LoggingEnabled=<true false>] |
| Option | |
| Test (optional) | Tests the TACACS+ configuration without applying changes |
| Properties | |
| Enabled (optional) | Enables or disables TACACS+ authentication. Valid values include "true" and "false". |
| ServerAddress (optional) | The IP address or the DNS name of the primary TACACS+ server used for authentication |

| Item | Description |
|------------------------------------|--|
| Port (optional) | The server TCP port number. Valid values include a valid port number between 1 and 65535. The default port number is 49. |
| ServerKey (optional) | The plain-text string used to encrypt user details exchanged with the primary TACACS server. It must match the server key configured for this VC on the primary server. TACACS authentication will not work if the server key is blank or null. |
| Timeout (optional) | The time in seconds by which a server response must be received before a new request is made. The valid range of values is from 1 to 600 seconds. The default timeout is 10 seconds. |
| SecondaryServer Address (optional) | The IP address or host name of the secondary TACACS server used for authentication |
| SecondaryPort (optional) | The TCP port to use for TACACS communication. Valid values include a valid port number between 1 and 65535. The default TCP port number is 49. |
| SecondaryServerKey (optional) | The plain-text string used to encrypt user details exchanged with the secondary TACACS server. It must match the server key configured for this VC on the secondary server. TACACS authentication will not work if the server key is blank or null. |
| SecondaryTimeout (optional) | The timeout value in seconds for TACACS communication with the secondary server |
| LoggingEnabled (optional) | Enables or disables command logging on the TACACS+ server. Valid values include "true" and "false". |
| Examples | |
| | <pre>->set tacacs -test Enabled=true ServerAddress=192.168.0.27 ->set tacacs -test Enabled=true Server Address=2001::40</pre> Tests the TACACS+ configuration changes without applying them |
| | <pre>->set tacacs Enabled=true ServerAddress=192.168.0.124 ServerKey=test123 SecondaryServerAddress=tacserver.hp.com SecondaryServerKey=test456 ->set tacacs Enabled=true ServerAddress=2001::70 ServerKey=test123 SecondaryServerAddress=tacserver.hp.com SecondaryServerKey=test456</pre> Enables TACACS+ authentication for users |
| | <pre>->set tacacs LoggingEnabled=true</pre> Enables TACACS server logging |

| Item | Description |
|----------------|--|
| show tacacs | Display the Virtual Connect TACACS+ authentication settings. |
| Syntax | show tacacs |
| Example | |
| | <pre>->show tacacs</pre> Displays TACACS+ information |

uplinkport

Manage interconnect module uplink ports.

Supported actions: add, help, remove, set, show

| Item | Description |
|----------------|---|
| add uplinkport | Add a new uplink port to an existing network or a shared uplink port set. |

| Item | Description |
|----------------------|---|
| Syntax | <pre>add uplinkport <PortID> [Network=<NetworkName> UplinkSet=<UplinkSetName>] [Speed=<Auto 10Mb 100Mb 1Gb 10Gb 40Gb Disabled>] [Role=<Primary Secondary>]</pre> |
| Parameter | |
| PortID (required) | <p>The ID of the uplink port to add. The ID is a combination of the enclosure name, interconnect bay, and port number in a single descriptor.</p> <ul style="list-style-type: none"> • If the uplinkset does not contain an FCoE network, the port ID uses the format <EnclosureID>:<InterconnectBay>:<PortNumber> • If the uplinkset contains an FCoE network, the port ID uses the format <InterconnectBay>:<PortNumber> <p>The uplink port is configured for all enclosures. For QSFP+ ports, the <PortNumber> format is Q<x>.<y>.</p> |
| Properties | |
| Network (required) | The name of an existing network to which the port is added if the shared uplink set name is not specified |
| UplinkSet (required) | The name of an existing shared uplink set to which the port is added if the network name is not specified |
| Speed (optional) | Specifies the port speed for the port (optional). Depending on the VC module, valid values are "Auto", "10Mb", "100Mb", "1Gb", "10Gb", "40Gb", and "Disabled". If not specified, the default port speed is "Auto". If no connector is present on the uplink port, only "Auto" and "Disabled" can be configured as the speed. Speed restrictions apply. |
| Role (optional) | The role played by the port if the connection mode of the network or shared uplink set is selected as "Failover". Valid values are "Primary" and "Secondary". The default value is "Primary". If the uplink set contains an FCoE network, then the Role property is not allowed. |
| Examples | |
| | <pre>->add uplinkport enc0:1:X1 Network=MyNetwork</pre> <p>Adds a new uplink port (Bay 1, Port 1) to a network named MyNetwork</p> |
| | <pre>->add uplinkport enc0:2:X4 Network=MyNetwork Speed=1Gb</pre> <p>Adds a new uplink port (Bay 2, Port 4) to a network and sets the port speed</p> |
| | <pre>->add uplinkport enc0:2:X3 UplinkSet=MyUplinkSet</pre> <p>Adds a new uplink port (Bay 2, Port 3) to a shared uplink set</p> |
| | <pre>->add uplinkport enc0:2:X4 Network=MyNetwork Role=Primary</pre> <p>Adds a new uplink port to a network with the connection mode as "Failover" and the port role as Primary</p> |
| | <pre>->add uplinkport 1:X2 UplinkSet=MyUplinkSet</pre> <p>Adds a new uplink port (Bay 1, Port 2) to a shared uplink set that contains an FCoE network</p> |
| | <pre>->add uplinkport enc0:1:Q1.1 Network=MyNetwork Speed=Auto</pre> <p>Adds a new QSFP+ uplink port (Bay 1, Port Q1.1) to a network named MyNetwork with a port speed set to "Auto"</p> |
| | <pre>->add uplinkport enc0:1:Q1.1 Uplinkset=MyUplinkSet Speed=Auto</pre> <p>Adds a new QSFP+ uplink port (Bay 1, Port Q1.1) to a shared uplink set with a port speed set to Auto</p> |
| | <pre>->add uplinkport enc0:1:Q1.1 Network=MyNetwork Speed=40Gb</pre> <p>Adds a new QSFP+ uplink port (Bay 1, Port Q1.1) to a network named MyNetwork with a port speed set to 40Gb</p> |

| Item | Description |
|------|---|
| | <pre>->add uplinkport enc0:1:Q1.1 Uplinkset=MyUplinkSet Speed=40Gb</pre> <p>Adds a new QSFP+ uplink port (Bay 1, Port Q1.1) to a shared uplink set with a port speed set to 40Gb</p> |

| Item | Description |
|----------------------|---|
| remove uplinkport | Remove an uplink port element from a network or a shared uplink port set. |
| Syntax | remove uplinkport <PortID> [Network=<NetworkName> UplinkSet=<UplinkSetName>] |
| Parameter | |
| PortID (required) | <p>The ID of the port to remove from a network. The specified port must already be added to a network or uplink port set.</p> <ul style="list-style-type: none"> If the uplinkset does not contain an FCoE network, the port ID uses the format <EnclosureID>:<InterconnectBay>:<PortNumber> If the uplinkset contains an FCoE network, the port ID uses the format <InterconnectBay>:<PortNumber> <p>The uplink port is configured for all enclosures. For QSFP+ ports, the <PortNumber> format is Q<x>.<y>.</p> |
| Properties | |
| Network (required) | The name of the network from which the port is removed if the UplinkSet name is not specified |
| UplinkSet (required) | The name of the shared uplink set from which the port is removed if the Network name is not specified |
| Examples | |
| | <pre>->remove uplinkport enc0:1:X2 Network=MyNetwork</pre> <p>Removes a specific uplink port (Bay 1, Port 2) from a network named MyNetwork</p> |
| | <pre>->remove uplinkport * Network=BlueNetwork</pre> <p>Removes all uplink ports from a network named BlueNetwork</p> |
| | <pre>->remove uplinkport enc0:2:X3 UplinkSet=SharedUplinkSet1</pre> <p>Removes a specific uplink port (Bay 2, Port 3) from a shared uplink set</p> |
| | <pre>->remove uplinkport 1:X1 UplinkSet=MyUplinkSet</pre> <p>Removes a specific uplink port (Bay 1, Port 1) from a shared uplink set that contains an FCoE network (affects all modules within a bay group)</p> |
| | <pre>->remove uplinkport enc0:1:Q1.1 Network=MyNetwork</pre> <p>Removes a specific QSFP+ uplink port (Bay 1, Port Q1.1) from a network named MyNetwork</p> |

| Item | Description |
|-------------------|--|
| set uplinkport | Modify an uplink port that exists as a member of a network or shared uplink port set. |
| Syntax | set uplinkport <PortID> [Network=<NetworkName> UplinkSet=<UplinkSetName>] [Speed=<Auto 10Mb 100Mb 1Gb 10Gb 40Gb Disabled>] [Role=<Primary Secondary>] |
| Parameter | |
| PortID (required) | <p>The ID of the port to modify. The specified port must already be added to a network or shared uplink set.</p> <ul style="list-style-type: none"> If the uplinkset does not contain an FCoE network, the port ID uses the format <EnclosureID>:<InterconnectBay>:<PortNumber> If the uplinkset contains an FCoE network, the port ID uses the format <InterconnectBay>:<PortNumber> <p>The uplink port is configured for all enclosures. For QSFP+ ports, the <PortNumber> format is Q<x>.<y>.</p> |
| Properties | |

| Item | Description |
|----------------------|--|
| Network (required) | The name of the network to which the port belongs if the shared uplink set name is not specified |
| UplinkSet (required) | The name of the shared uplink set to which the port belongs if the network name is not specified |
| Speed (optional) | Specifies the port speed for the port. Depending on the VC module, valid values are "Auto", "10Mb", "100Mb", "1Gb", "10Gb", "40Gb", and "Disabled". If no connector is present on the uplink port, only "Auto" and "Disabled" can be configured as the speed. Speed restrictions apply. |
| Role (optional) | The role played by the port if the connection mode of the network or shared uplink set is selected as "Failover". Valid values are "Primary" and "Secondary". The default value is "Primary". If the uplink set contains an FCoE network, then the role property is not allowed. |
| Examples | |
| | ->set uplinkport enc0:1:X2 Network=MyNetwork Speed=1Gb Changes the port speed of a network port |
| | ->set uplinkport enc0:2:X1 Network=MyNetwork Speed=Disabled Disables a specific port that belongs to a network |
| | ->set uplinkport enc0:2:X4 UplinkSet=MyUplinkSet Speed=Disabled Disables a specific port that belongs to a shared uplink set |
| | ->set uplinkport enc0:2:X4 Network=MyNetwork Role=Secondary Modifies the role of the network uplink port with the connection mode on the network or the shared uplink set as "Failover" to take the Secondary port role |
| | ->set uplinkport enc0:1:Q1.1 Network=MyNetwork Speed=Auto Changes the port speed of a QSFP+ uplink port |
| | ->set uplinkport enc0:1:Q1.1 Uplinkset=MyUplinkSet Speed=Auto Changes the port speed of a QSFP+ uplink port that belongs to a shared uplink set |
| | ->set uplinkport enc0:1:Q1.1 Network=MyNetwork Speed=40Gb Changes the port speed of a QSFP+ uplink port to "40Gb" |
| | ->set uplinkport enc0:1:Q1.1 Uplinkset=MyUplinkSet Speed=40Gb Changes the port speed of a QSFP+ uplink port that belongs to a shared uplink set to "40Gb" |

| Item | Description |
|---------------------|---|
| show uplinkport | Display all Ethernet module uplink ports known to the domain. If the port is a member of a network or a shared uplink set, it appears. If the port is unlinked and no connectivity exists, the cause is displayed. For more information about possible causes, see "Port status conditions (on page 201)." |
| Syntax | show uplinkport <PortID *> [FilterBy] |
| Parameters | |
| PortID (optional) | The ID of the uplink port. The PortID format is <EnclosureID>:<Bay>:<PortNumber> For QSFP+ ports, the <PortNumber> format is Q<x>.<y>. Use "*" to display a detailed view of all uplink ports. |
| FilterBy (optional) | Filters the output of the show command by the specified attribute. The option is specified in the format <columnID>=<value>. For example, to display uplink ports belonging to enclosure enc0, specify ID=enc0. To display all ports using an RJ-45 connector type, specify Type=RJ45. You can specify more than one filter option in a single command, for example, show uplinkport ID=enc0 Type=RJ45. |
| Examples | |
| | ->show uplinkport Displays all uplink ports |

| Item | Description |
|------|--|
| | ->show uplinkport enc0:5:X6 Displays details of uplink port 6 in bay 5 of the local enclosure |
| | ->show uplinkport * Displays all uplink ports in the enclosure (detailed view) |
| | ->show uplinkport ID=enc0:1 Displays all the uplink ports for bay 1 of the local enclosure |
| | ->show uplinkport status=Linked Displays all the uplink ports that are linked |
| | ->show uplinkport ID=enc0:1 type=RJ45 Displays all the uplink ports for bay 1 of the local enclosure with connector type RJ-45 |
| | ->show uplinkport enc0:3:Q1.1 Displays detailed information for uplink port enc0:3:Q1.1 |
| | ->show uplinkport ID=enc0:3 type=QSFP+ Displays all the uplink ports for bay 3 of the local enclosure with connector type QSFP+ |

uplinkset

Manage shared uplink sets.

Supported actions: add, copy, help, remove, set, show

| Item | Description |
|------------------------------|---|
| add uplinkset | Create a new shared uplink set. |
| Syntax | add uplinkset <UplinkSetName> [ConnectionMode=<Auto Failover>] [LacpTimer=<Domain-Default Short Long>] |
| Parameter | |
| UplinkSetName (required) | The unique name of the new shared uplink set to create |
| Properties | |
| ConnectionMode (optional) | Specifies the connection type that is formed when multiple ports are added to the shared uplink set. Valid values include "Auto" and "Failover". The default value is "Auto". |
| LacpTimer (optional) | Specifies the domain default LACP timer. Valid values are "Domain-Default", "Short", and "Long". This property can be specified only if the ConnectionMode is "Auto". |
| Examples | |
| | ->add uplinkset MyNewUplinkSet Creates a new shared uplink set and adds it to the domain |
| | ->add uplinkset MyNewUplinkSet ConnectionMode=Failover Creates a new shared uplink set and sets the connection mode to Failover |
| | ->add uplinkset MyNewUplinkSet ConnectionMode=Auto LacpTimer=Domain-Default Creates a new shared uplink set using the domain default LACP timer |

| Item | Description |
|-------------------|--|
| copy uplinkset | Copy a shared uplink port set. The copy uplinkset command does not allow copying of Private Networks within the shared uplink set. |
| Syntax | copy uplinkset <fromSUS> <toSUS> fromVlanStr=<vlanString> toVlanStr=<vlanString> [replace=<all first last>] |
| Parameters | |

| Item | Description |
|------------------------|--|
| fromSUS (required) | The unique name of the shared uplink set to copy from |
| toSUS (required) | The unique name of the shared uplink set to copy to |
| Properties | |
| fromVlanStr (required) | The partial network name string to be replaced. The fromVlanStr property cannot be empty and must be present in all associated network names. |
| toVlanStr (required) | The network name string to be replaced to. The new network name cannot exceed 64 characters. This string can be empty, which is considered as removing fromVlanStr from all associated network names. |
| replace (optional) | The instance of the string replacement to occur. Valid values include "all", "first", and "last". The default value is "all". |
| Example | |
| | <pre>->copy uplinkset uplinkset_1 uplinkset_2 fromVlanStr=LEFT toVlanStr=RIGHT replace=first</pre> <p>Copies uplinkset_1 to uplinkset_2 and replaces the first instance of LEFT to RIGHT in the name string of all associate networks</p> |

| Item | Description |
|--------------------------|---|
| remove uplinkset | Remove a shared uplink port set from the domain. |
| Syntax | remove uplinkset <UplinkSetName *> |
| Parameter | |
| UplinkSetName (required) | The name of an existing shared uplink set. Use "*" to remove all existing shared uplink sets from the domain. |
| Example | |
| | <pre>->remove uplinkset MyUplinkSet</pre> <p>Removes a shared uplink set</p> |
| | <pre>->remove uplinkset *</pre> <p>Removes all shared uplink sets from the domain</p> |

| Item | Description |
|---------------------------|--|
| set uplinkset | Modify an existing shared uplink port set. |
| Syntax | <pre>set uplinkset <UplinkSetName> [Name=<NewName>] [ConnectionMode=<Auto Failover>] [LacpTimer=<Domain-Default Short Long>]</pre> |
| Parameter | |
| UplinkSetName (required) | The name of an existing shared uplink set to modify |
| Properties | |
| Name (optional) | The new name of the shared uplink set |
| ConnectionMode (optional) | Specifies the connection type that is formed when multiple ports are added to the shared uplink set. Valid values include "Auto" and "Failover". The default value is "Auto". If the uplink set has an FCoE network, then the ConnectionMode property is disallowed. |
| LacpTimer (optional) | Specifies the domain default LACP timer. Valid values are "Domain-Default", "Short", and "Long". This property can be specified only if the ConnectionMode is "Auto". |
| Examples | |
| | <pre>->set uplinkset Blue Name=Red</pre> <p>Changes the name of a shared uplink set from Blue to Red</p> |
| | <pre>->set uplinkset Blue connectionMode=Failover</pre> |

| Item | Description |
|------|--|
| | Changes the connection mode of a shared uplink set named Blue to Failover |
| | ->set uplinkset UplinkSet-1 ConnectionMode=Auto LacpTimer=Long Modifies the shared uplink set LACP timer configuration |

| Item | Description |
|-----------------------------|--|
| show uplinkset | Display shared uplink configurations. |
| Syntax | show uplinkset [<UplinkSetName> *] |
| Parameter | |
| UplinkSetName (optional) | Name of an existing shared uplink set. Use "*" to display a detailed view of all shared uplink sets. If not specified, a summary of all shared uplink sets is displayed. |
| Examples | |
| | ->show uplinkset Displays a summary of all shared uplink sets |
| | ->show uplinkset * Displays detailed information for all shared uplink sets |
| | ->show uplinkset MyUplinkSet Displays detailed information for a shared uplink set named MyUplinkSet |

user-security

Manage local user security settings.

Supported actions: help, set, show

| Item | Description |
|---------------------------------|---|
| set user-security | Modify domain user security settings and enforce additional security requirements for user passwords. |
| Syntax | set user-security [StrongPasswords=<Enabled Disabled>] [MinPasswordLength=<3-40>] |
| Properties | |
| StrongPasswords (optional) | Enables or disables strong password enforcement. If enabled, then new, local users that are created are validated against the password characteristics specified. Valid values include: "Enabled" and "Disabled". |
| MinPasswordLength (optional) | The minimum password length allowed for new passwords when adding a new user and when changing an existing password. The default value is 8. |
| Examples | |
| | ->set user-security StrongPasswords=Enabled Enables strong user password enforcement |
| | ->set user-security StrongPasswords=Disabled Disables strong user password enforcement |
| | ->set user-security MinPasswordLength=10 Modifies the minimum password length |

| Item | Description |
|--------------------|--|
| show user-security | Display general domain user security settings. |
| Syntax | show user-security |
| Example | |

| Item | Description |
|------|---|
| | ->show user-security Displays user security settings |

user-security

Manage local user security settings.

Supported actions: help, set, show

| Item | Description |
|------------------------------|--|
| set user-security | Modify domain user security settings and enforce additional security requirements for user passwords. |
| Syntax | set user-security [StrongPasswords=<Enabled Disabled>] [MinPasswordLength=<3-40>] |
| Properties | |
| StrongPasswords (optional) | Enables or disables strong password enforcement. If enabled, then new, local users that are created are validated against the password characteristics specified. Valid values include: "Enabled" and "Disabled". When the domain is in FIPS mode, the password strength cannot be changed. |
| MinPasswordLength (optional) | The minimum password length allowed for new passwords when adding a new user and when changing an existing password. The default value is 8. When the domain is in FIPS mode, the password length cannot be less than 8 characters. |
| Examples | |
| | ->set user-security StrongPasswords=Enabled Enables strong user password enforcement |
| | ->set user-security StrongPasswords=Disabled Disables strong user password enforcement |
| | ->set user-security MinPasswordLength=10 Modifies the minimum password length |

| Item | Description |
|--------------------|---|
| show user-security | Display general domain user security settings. |
| Syntax | show user-security |
| Example | |
| | ->show user-security Displays user security settings |

user



IMPORTANT: Role operations assigned to users with Server role permissions are not available when the VC domain is under VCEM control.

Manage local domain user configurations.

Supported actions: add, help, remove, set, show

| Item | Description |
|---------------|---|
| add user | Create a new user and add the user to the Virtual Connect Manager database. |
| Syntax | add user <UserName> Password=<password> [FullName=<Full |

| Item | Description |
|------------------------|---|
| | Name>] [ContactInfo=<Contact Details>] [Enabled=<True False>] [Roles=<Storage Network Server Domain *>] |
| Parameter | |
| UserName (required) | The name of the new user to add. The user name must be unique within the domain. The maximum length is 31 characters. |
| Properties | |
| Password (required) | The password for the new user. The new user password can be entered as clear text in the command or as a masked string at the prompt. When a domain is first created, the default minimum length of a password is 8 characters. Virtual Connect allows a password length between 3 and 40 characters. The password length can be adjusted using the <code>set user-security</code> command. |
| FullName (optional) | The full name of the user |
| ContactInfo (optional) | Contact information for the user |
| Enabled (optional) | Enables or disables the user. Valid values are "true" and "false". If not specified, the default is "true". |
| Roles (optional) | The allowed roles for the user. Valid values are any combination of "domain", "server", "network", or "storage" separated by commas. If no roles are specified, the user can view domain information only. Use "*" to specify all roles. |
| Examples | |
| | ->add user steve Password=fgY87hH1 Adds a new user by specifying the minimal amount of properties |
| | ->add user bill Password=HGtwf7272562 Roles="domain,network" FullName="Bill Johnson" ContactInfo=billj@company.com Enabled=true Adds a new user and configures additional user properties |
| | ->add user Admin Password=hjkhfd Roles=* Adds an Admin user with all roles |

| Item | Description |
|---------------------|---|
| remove user | Remove a user from the Virtual Connect Manager database. |
| Syntax | remove user <username *> |
| Parameter | |
| UserName (required) | The name of an existing user to be removed. Use "*" to remove all users except for the default Administrator account. |
| Examples | |
| | ->remove user steve Removes a specific user by name |
| | ->remove user * Removes all users except the default Administrator account |

| Item | Description |
|---------------------|--|
| set user | Modify attributes of an existing user. |
| Syntax | set user <UserName> [<password>] [FullName=<Full Name>] [ContactInfo=<Contact Details>] [Enabled=<True False>] [Roles=<Storage Network Server Domain *>] |
| Parameter | |
| UserName (required) | The name of the user to modify |
| Properties | |

| Item | Description |
|------------------------|--|
| Password (optional) | The new password of the user can be entered as clear text in the command. If the Password value is blank, you are prompted to enter the password, and the characters entered are masked. When a domain is first created, the default minimum length of a password is 8 characters. Virtual Connect allows a password length between 3 and 40 characters. The password length can be adjusted using the <code>set user-security</code> command. |
| FullName (optional) | The full name of the user |
| ContactInfo (optional) | Contact information for the user |
| Enabled (optional) | Enables or disables the user. Valid values are "true" and "false". The default value is "true". |
| Roles (optional) | The allowed roles for the user. Valid values are any combination of "domain", "server", "network", or "storage" separated by commas. If no roles are specified, the user can view domain information only. Use "*" to specify all roles. |
| Examples | |
| | <code>->set user steve Password=fgY87hHl</code> Modifies an existing user password |
| | <code>->set user steve Password</code> Modifies an existing user password, masked at the prompt |
| | <code>->set user bill Password=HGtwf7272562 Roles="domain,network" FullName="Bill Johnson" ContactInfo=billj@company.com Enabled=true</code> Modifies several properties of an existing user |
| | <code>->set user tom roles=*</code> Gives user tom all privileges |

| Item | Description |
|------------------------|--|
| <code>show user</code> | Display user summary or user details. |
| Syntax | <code>show user [<username *>]</code> |
| Parameter | |
| UserName (optional) | Name of an existing user in the VC domain. If not specified, a summary of all users is displayed. Use "*" to display detailed information for all users. |
| Examples | |
| | <code>->show user</code> Lists all existing users |
| | <code>->show user steve</code> Displays details of an existing user by name |
| | <code>->show user *</code> Displays details of all existing users |

vcm

Reset the Virtual Connect Manager.

Supported actions: help, reset

| Item | Description |
|------------------------|--|
| <code>reset vcm</code> | Reset the Virtual Connect Manager. A failover to the backup VCM can also be specified (optional), if a backup VCM is available. IMPORTANT: Resetting the VCM causes a temporary loss in connectivity with the Virtual Connect Manager. If failover is specified and a backup VCM |

| Item | Description |
|-----------------|--|
| | exists, users are logged off and must reconnect using the backup VCM IP address. |
| Syntax | <code>reset vcm [-failover]</code> |
| Option | |
| Failover | Forces a failover from the current primary VCM to the backup VCM. |
| Examples | |
| | ->reset vcm Resets the Virtual Connect Manager |
| | ->reset vcm -failover Resets the Virtual Connect Manager and forces a failover to the backup VCM (if available) |

version

Display CLI version information.

Supported actions: help, show

| Item | Description |
|----------------|--|
| show version | Display CLI version information. |
| Syntax | <code>show version</code> |
| Example | ->show version Displays CLI version and copyright information |

User roles

The following table lists required user roles for CLI commands.

| Command | Element | Domain | Network | Server | Storage | All access |
|---------|--------------------|--------|---------|--------|---------|------------|
| add | banner | X | — | — | — | — |
| | enet-connection | — | — | X | — | — |
| | fabric | — | — | — | X | — |
| | fc-connection | — | — | X | — | — |
| | fcoe-connection | — | — | X | — | — |
| | iscsi-connection | — | — | X | — | — |
| | storage-management | — | — | — | X | — |
| | ldap-group | X | — | — | — | — |
| | radius-group | X | — | — | — | — |
| | log-target | X | — | — | — | — |
| | mfs-filter | — | — | X | — | — |
| | mcast-filter | — | — | X | — | — |
| | mcast-filter-rule | — | — | X | — | — |
| | mcast-filter-set | — | — | X | — | — |

| Command | Element | Domain | Network | Server | Storage | All access |
|----------|----------------------|--------|---------|--------|---------|------------|
| | nag-network | — | X | — | — | — |
| | network | — | X | — | — | — |
| | network-access-group | — | X | — | — | — |
| | port-monitor | — | X | X | — | — |
| | profile | — | — | X | — | — |
| | server-port-map | — | — | X | — | — |
| | sflow-ports | X | X | X | — | — |
| | sflow-receiver | X | X | X | — | — |
| | snmp-access | X | X | — | — | — |
| | snmp-trap | X | X | — | — | — |
| | uplinkport | — | X | — | — | — |
| | uplinkset | — | X | — | — | — |
| | user | X | — | — | — | — |
| assign | profile | — | — | X | — | — |
| copy | profile | — | — | X | — | — |
| delete | domain | X | — | — | — | — |
| exit | — | X | X | X | X | X |
| help | — | X | X | X | X | X |
| import | enclosure | X | — | — | — | — |
| load | ldap-certificate | X | — | — | — | — |
| | profile | — | — | X | — | — |
| | ssh | X | — | — | — | — |
| | ssl-certificate | X | — | — | — | — |
| poweroff | server | — | — | X | — | — |
| poweron | server | — | — | X | — | — |
| reboot | server | — | — | X | — | — |
| remove | banner | X | — | — | — | — |
| | enclosure | X | — | — | — | — |
| | enet-connection | — | — | X | — | — |
| | external-manager | X | — | — | — | — |
| | fabric | — | — | — | X | — |
| | fc-connection | — | — | X | — | — |
| | fcoe-connection | — | — | X | — | — |
| | iscsi-boot-param | — | — | X | — | — |
| | iscsi-connection | — | — | X | — | — |
| | sflow-ports | X | X | X | — | — |
| | sflow-receiver | X | X | X | — | — |

| Command | Element | Domain | Network | Server | Storage | All access |
|---------|----------------------|--------|---------|--------|---------|------------|
| | storage-management | — | — | — | X | — |
| | ldap-certificate | X | — | — | — | — |
| | ldap-group | X | — | — | — | — |
| | radius-group | X | — | — | — | — |
| | log-target | X | — | — | — | — |
| | mfs-filter | — | — | X | — | — |
| | mcast-filter | — | — | X | — | — |
| | mcast-filter-set | — | — | X | — | — |
| | nag-network | — | X | — | — | — |
| | network | — | X | — | — | — |
| | network-access-group | — | X | — | — | — |
| | port-monitor | — | X | X | — | — |
| | profile | — | — | X | — | — |
| | server-port-map | — | — | X | — | — |
| | snmp-access | X | X | — | — | — |
| | snmp-trap | X | X | — | — | — |
| | ssh | X | — | — | — | — |
| | uplinkport | — | X | — | — | — |
| | uplinkset | — | X | — | — | — |
| | user | X | — | — | — | — |
| reset | loop-protect | — | X | — | — | — |
| | port-protect | — | X | — | — | — |
| | qos | — | X | — | — | — |
| | sflow-module | X | X | X | — | — |
| | statistics | — | X | — | — | — |
| | vcm | X | — | — | — | — |
| save | configbackup | X | — | — | — | — |
| | profile | X | X | X | X | X |
| | ssl-csr | X | — | — | — | — |
| | supportinfo | X | X | X | X | X |
| set | auto-deployment | X | — | — | — | — |
| | configuration | X | — | — | — | — |
| | domain | X | — | — | — | — |
| | enet-connection | — | — | X | — | — |
| | enet-vlan | — | X | — | — | — |

| Command | Element | Domain | Network | Server | Storage | All access |
|---------|----------------------|--------|---------|--------|---------|------------|
| | external-manager | X | — | — | — | — |
| | fabric | — | — | — | X | — |
| | fc-connection | — | — | X | — | — |
| | fcoe-connection | — | — | X | — | — |
| | igmp | — | X | — | — | — |
| | interconnect | X | — | — | — | — |
| | iscsi-boot-param | — | — | X | — | — |
| | iscsi-connection | — | — | X | — | — |
| | storage-management | — | — | — | X | — |
| | lacp-timer | — | X | — | — | — |
| | ldap | X | — | — | — | — |
| | ldap-group | X | — | — | — | — |
| | local-users | X* | — | — | — | — |
| | radius | X | — | — | — | — |
| | radius-group | X | — | — | — | — |
| | tacacs | X | — | — | — | — |
| | role | X | — | — | — | — |
| | link-dist-interval | — | — | — | X | — |
| | log-target | X | — | — | — | — |
| | loop-protect | — | X | — | — | — |
| | mac-cache | — | X | — | — | — |
| | mcast-filter | — | — | X | — | — |
| | mcast-filter-set | — | — | X | — | — |
| | network | — | X | — | — | — |
| | network-access-group | — | X | — | — | — |
| | port-monitor | — | X | X | — | — |
| | port-protect | — | X | — | — | — |
| | profile | — | — | X | — | — |
| | qos | — | X | — | — | — |
| | qos-class | — | X | — | — | — |
| | qos-classifier | — | X | — | — | — |
| | qos-map | — | X | — | — | — |
| | serverid | — | — | X | — | — |
| | server-port-map | — | — | X | — | — |
| | session | X | — | — | — | — |

| Command | Element | Domain | Network | Server | Storage | All access |
|---------|------------------------|--------|---------|--------|---------|------------|
| | sflow | X | X | X | — | — |
| | sflow-module | X | X | X | — | — |
| | sflow-ports | X | X | X | — | — |
| | sflow-receiver | X | X | X | — | — |
| | snmp | X | X | — | — | — |
| | snmp-trap | X | X | — | — | — |
| | ssl | X | — | — | — | — |
| | statistics-throughput | — | X | — | — | — |
| | uplinkport | — | X | — | — | — |
| | uplinkset | — | X | — | — | — |
| | user | X | — | — | — | — |
| | user-security | X | — | — | — | — |
| show | all | X | X | X | X | X |
| | auto-deployment | | | | | |
| | activity | X | X | X | X | X |
| | banner | X | X | X | X | X |
| | configuration | X | — | — | — | — |
| | connection-map | X | X | X | X | X |
| | devicebay | X | X | X | X | X |
| | domain | X | X | X | X | X |
| | enclosure | X | X | X | X | X |
| | enet-connection | X | X | X | X | X |
| | enet-vlan | X | X | X | X | X |
| | external-manager | X | X | X | X | X |
| | fabric | X | X | X | X | X |
| | fc-connection | X | X | X | X | X |
| | fcoe-connection | X | X | X | X | X |
| | firmware | X | X | X | X | X |
| | igmp | X | X | X | X | X |
| | igmp-group | X | X | X | X | X |
| | interconnect | X | X | X | X | X |
| | interconnect-mac-table | X | X | X | X | X |
| | iscsi-boot-param | X | X | X | X | X |
| | iscsi-connection | X | X | X | X | X |
| | storage-management | X | X | X | X | X |

| Command | Element | Domain | Network | Server | Storage | All access |
|---------|----------------------|--------|---------|--------|---------|------------|
| | lACP-timer | — | X | — | — | — |
| | ldap | X | X | X | X | X |
| | ldap-certificate | X | X | X | X | X |
| | ldap-group | X | X | X | X | X |
| | local-users | X | X | X | X | X |
| | mcast-filter | — | — | X | — | — |
| | mcast-filter-rule | — | — | X | — | — |
| | mcast-filter-set | — | — | X | — | — |
| | name-server | X | X | X | X | X |
| | qos | X | X | X | X | X |
| | qos-class | X | X | X | X | X |
| | qos-classifier | X | X | X | X | X |
| | qos-map | X | X | X | X | X |
| | radius | X | X | X | X | X |
| | radius-group | X | X | X | X | X |
| | sflow | X | X | X | X | X |
| | sflow-receiver | X | X | X | X | X |
| | sflow-module | X | X | X | X | X |
| | sflow-ports | X | X | X | X | X |
| | tacacs | X | X | X | X | X |
| | role | X | X | X | X | X |
| | link-dist-interval | X | X | X | X | X |
| | lldp | X | X | X | X | X |
| | log-target | X | X | X | X | X |
| | loop-protect | X | X | X | X | X |
| | mac-cache | X | X | X | X | X |
| | nag-network | X | X | X | X | X |
| | network | X | X | X | X | X |
| | network-access-group | X | X | X | X | X |
| | port-monitor | X | X | X | X | X |
| | port-protect | X | X | X | X | X |
| | profile | X | X | X | X | X |
| | config | X | — | — | — | — |
| | server | X | X | X | X | X |
| | serverid | X | X | X | X | X |

| Command | Element | Domain | Network | Server | Storage | All access |
|----------|-----------------------|--------|---------|--------|---------|------------|
| | server-port | X | X | X | X | X |
| | server-port-map | X | X | X | X | X |
| | session | X | — | — | — | — |
| | snmp | X | X | X | X | X |
| | snmp-access | X | X | X | X | X |
| | snmp-trap | X | X | X | X | X |
| | ssh | X | X | X | X | X |
| | ssl | X | X | X | X | X |
| | ssl-certificate | X | X | X | X | X |
| | stackinglink | X | X | X | X | X |
| | statistics | X | X | X | X | X |
| | statistics-throughput | X | X | X | X | X |
| | status | X | X | X | X | X |
| | systemlog | X | — | — | — | — |
| | uplinkport | X | X | X | X | X |
| | uplinkset | X | X | X | X | X |
| | user | X | — | — | — | — |
| | user-security | X | X | X | X | X |
| | version | X | X | X | X | X |
| start | auto-deployment | X | — | — | — | — |
| stop | auto-deployment | X | — | — | — | — |
| test | log-target | X | X | X | X | X |
| | snmp-trap | X | X | X | X | X |
| unassign | profile | — | — | X | — | — |

*To disable or enable local user authentication you must be logged in as a remote (LDAP, RADIUS or TACACS) user with domain privileges. The primary remote authentication method can be set by any user with domain privileges.

Help subsystem

The help subsystem consists of three options:

- **Help summary**—lists all supported actions and a short description of each:

```
>help (or ?)
add          add an element to an existing object
assign       assign a server profile to a device bay
. . .
```
- **Subcommand help**—displays help details associated with a specific subcommand, including supported managed elements:

```
>assign -help (or assign ?)
```

assign a server profile to a device bay

Managed Elements:
profile

Examples:
assign profile MyProfile enc0:1

- **Management element help**—provides a listing of objects that are supported with a specific subcommand and a brief description of the management element and what it represents in the management model:
->help devicebay

General Enclosure Device Bay settings and information

Supported Subcommands:
help
show

->show devicebay -help

Description:

This command displays all device bays in the domain

Syntax:

show devicebay [<DeviceBayName> | *]

Parameters:

DeviceBayName : The reference name of a device bay in the domain.
The format of the device bay name is
<EnclosureID:DeviceBay>

Examples:

- Display a summary listing of all device bays:
->show devicebay
- Show detailed information for all device bays:
->show device bay *
- Show detailed information for a specific device bay 2 of
a specific enclosure:

```
->show devicebay enc0:2
```

Output format

The CLI provides two different output formats:

- Interactive user output format
- Scriptable output format

The interactive user output format is the default. However, by using a command-line option, you can also specify a "parse-friendly" output format, which provides data in a format that can be easily interpreted by automated scripts invoking the CLI. The different output formats primarily impact the `show` subcommand in the CLI infrastructure, where a majority of the informational details are displayed.

Interactive user output format

The interactive user output format provides a user friendly view of information at the command line. When providing an overview, or listing, of several instances of data, a tabular text format is displayed. If an individual instance of data is being displayed, then the stanza format is used.

Example 1: Tabular text output format for displaying a user list

```
->show user
```

```
=====
=====
UserName      Roles      Roles Operations  FullName      ContactInfo
Enabled
=====
=====
Administrator  domain    FirmwareUpdate  -- --        -- --
true
              server    PortMonitoring
              network  RestoreConfig
              storage  SaveConfig
              SupportFiles
-----
-----
steve          domain    FirmwareUpdate  Steve Johnson
steve.johnson@hp.com true
              server    PortMonitoring
              network  RestoreConfig
              storage  SaveConfig
              SupportFiles
-----
-----
```

Example 2: Stanza output format for displaying a single user instance

```
->show user steve
```

```
UserName      : steve
Roles         : domain, server, network, storage
Role Operations :
FirmwareUpdate, PortMonitoring, RestoreConfig, SaveConfig, SupportFiles
FullName      : Steve Johnson
ContactInfo   : steve.johnson@hp.com
Enabled       : true
```

Example 3: Stanza output format for displaying all user details

```
->show user *
UserName      : Administrator
Roles         : domain, server, network, storage
Role Operations :
FirmwareUpdate, PortMonitoring, RestoreConfig, SaveConfig, SupportFiles
FullName      : -- --
ContactInfo   : -- --
Enabled       : true

UserName      : steve
Roles         : domain, server, network, storage
Role Operations :
FirmwareUpdate, PortMonitoring, RestoreConfig, SaveConfig, SupportFiles
FullName      : Steve Johnson
ContactInfo   : steve.johnson@hp.com
Enabled       : true
```

Scriptable output format

Scriptable output format allows scripts to invoke CLI commands and receive command responses that can be easily parsed by the scripts. This capability is provided by two options that are available: `-output=script1` and `-output=script2`. These options are described in more detail below. To display output with no headers or labels, use `no-headers` as an additional output option value.



IMPORTANT: If the delimiter is present within the data, then the entire value is surrounded by double quotes.

When scripting CLI commands, only a single scripting client should perform remote management operations to a remote VC Manager. If multiple scripting clients are used to perform a heavy load of CLI commands to a single VC Manager, some management commands might fail. In some cases, the primary module might need to be reset to recover properly.

- **Script1 Output Format**

The `script1` output format can be used to format the output using a name-value pair format, using an equal sign as the delimiter. All text on the left side of the equal sign designates the "name" of a property, and the text on the right side of the equal sign designates the "value" of the property. If `no-headers` is provided as an additional option value, only the values are displayed. Each property is displayed on a separate line.

- **Script2 Output Format**

The `script2` output format can be used to format all instance data in a single line, using a semi-colon as the delimiter for the data. The first line contains the property names. This format is consistent with a

"table view" of the data, where the first line is represented by a list of column labels, while the remaining lines provide the actual data being displayed. Each line represents a single instance of data. For example, in the case of showing users, each line provides all data corresponding to a single user instance.

The following examples provide some common scenarios for using the script output format options.

Example 1: Scriptable output format displaying all enclosures

```
->show enclosure -output=script1
ID=enc0
Name=Enclosure1
Import Status=Imported
Serial Number=USE0000BK2
Part Number=403321-021
Asset Tag=OA ASSET 453
```

Example 2: Scriptable output format displaying user "Administrator" information

```
->show user Administrator -output=script1
User Name=Administrator
Roles=domain,server,network,storage
Role
Operations=FirmwareUpdate,PortMonitoring,RestoreConfig,SaveConfig,SupportFiles
Full Name=-- --
Contact Info=-- --
Enabled=true
```

Example 3: Scriptable output format displaying all users (with table header)

```
->show user -output=script2
UserName;Roles;Role Operations;FullName;Contact Info;Enabled
Administrator;domain server network storage;FirmwareUpdate PortMonitoring
RestoreConfig SaveConfig SupportFiles;-- --;-- --;true
steve;domain server network storage;FirmwareUpdate PortMonitoring
RestoreConfig SaveConfig SupportFiles;Steve
Johnson;steve.johnson@hp.com;true
```

Example 4: Scriptable output format displaying all users (no table header)

```
->show user -output=script2,no-headers
Administrator;domain server network storage;FirmwareUpdate PortMonitoring
RestoreConfig SaveConfig SupportFiles;-- --;-- --;true
steve;domain server network storage;FirmwareUpdate PortMonitoring
RestoreConfig SaveConfig SupportFiles;Steve
Johnson;steve.johnson@hp.com;true
```

Example 5: Scriptable output format displaying a single user (with table header)

```
->show user steve -output=script2
UserName;Roles;Role Operations;FullName;Contact Info;Enabled
steve;domain,server,network,storage;FirmwareUpdate,PortMonitoring,RestoreConfig,SaveConfig,SupportFiles;Steve Johnson;steve.johnson@hp.com;true
```

Example 6: Scriptable output format displaying a single user (no table header)

```
->show user steve -output=script2,no-headers
```

```
steve;domain,server,network,storage;FirmwareUpdate,PortMonitoring,RestoreConfig,SaveConfig,SupportFiles;Steve Johnson;steve.johnson@hp.com;true
```

Statistics descriptions

Ethernet modules

Ethernet uplink and downlink ports

| Name | RFC | Description |
|----------------------------|------|---|
| rfc1213_ifInDiscards | 1213 | The number of inbound packets discarded to prevent delivery to a higher-layer protocol even though no errors were detected. These packets can be discarded to make buffer space available. |
| rfc1213_ifInErrors | 1213 | The number of inbound packets containing errors that prevent delivery to a higher-layer protocol |
| rfc1213_ifInNUcastPkts | 1213 | The total number of packets that higher-level protocols requested to be transmitted to a nonunicast address (such as a subnetwork-broadcast address or a subnetwork-multicast address), including those packets that were discarded or not sent. |
| rfc1213_ifInOctets | 1213 | The total number of octets received on the interface, including framing characters |
| rfc1213_ifInUcastPkts | 1213 | The number of subnetwork-unicast packets delivered to a higher-layer protocol |
| rfc1213_ifInUnknown Protos | 1213 | The number of packets received through the interface that were discarded due to an unknown or unsupported protocol |
| rfc1213_ifOutDiscards | 1213 | The number of outbound packets discarded to prevent transmission even though no errors were detected. These packets can be discarded to make buffer space available. |
| rfc1213_ifOutErrors | 1213 | The number of outbound packets that could not be transmitted due to errors |
| rfc1213_ifOutNUcastPkts | 1213 | The total number of packets that higher-level protocols requested to be transmitted to a subnetwork-unicast address, including those packets that were discarded or not sent |
| rfc1213_ifOutOctets | 1213 | The total number of octets transmitted through the interface, including framing characters |
| rfc1213_ifOutQLen | 1213 | The length of the output packet queue (in packets) |
| rfc1213_ifOutUcastPkts | 1213 | The total number of packets that higher-level protocols requested to be transmitted to a subnetwork-unicast address, including those packets that were discarded or not sent |
| rfc1213_ipForwDatagrams | 1213 | The number of input datagrams for which this entity was not the final IP destination, resulting in an attempt being made to locate a route to the final destination. In entities that do not act as IP gateways, this counter only includes packets that were source-routed through this entity with successful source-route option processing. |
| rfc1213_ipInDiscards | 1213 | The number of input datagrams discarded to prevent continued processing even though no problems were encountered. These datagrams can be discarded to make buffer space available. This counter does not include any datagrams discarded while awaiting reassembly. |

| Name | RFC | Description |
|--|------|--|
| rfc1213_IplnHdrErrors | 1213 | The number of input datagrams discarded due to errors in the IP header. Possible errors include bad checksums, version number mismatches, format errors, time-to-live exceeded, errors discovered while processing IP options, and so on. |
| rfc1213_IplnReceives | 1213 | The total number of input datagrams received from interfaces, including datagrams received in error |
| rfc1493_Dot1dBasePortDelayExceededDiscards | 1493 | The number of frames discarded by this port due to an excessive transit delay through the bridge (incremented by both transparent and source route bridges) |
| rfc1213_Dot1dBasePortMtuExceededDiscards | 1493 | The number of frames discarded by this port due to excessive size (incremented by both transparent and source route bridges) |
| rfc1213_Dot1dPortInDiscards | 1493 | The number of valid frames received that were discarded (filtered) by the Forwarding Process |
| rfc1213_Dot1dTpPortInFrames | 1493 | The number of frames received by this port from its segment. A frame received on the interface that corresponds to this port is only counted by this object if it is for a protocol being processed by the local bridging function, including bridge management frames. |
| rfc1757_StatsBroadcastPkts | 1757 | The number of good packets received during the sampling interval that were directed to the broadcast address |
| rfc1757_StatsCRCAlignErrors | 1757 | The total number of packets received with a length of between 64 and 1518 octets (excluding framing bits, but including FCS octets), inclusive, but had either a bad FCS with an integral number of octets (FCS Error) or a bad FCS with a nonintegral number of octets (Alignment Error). |
| rfc1757_StatsCollisions | 1757 | <p>The best estimate of the total number of collisions in this Ethernet segment. The value returned depends on the location of the RMON probe. Section 8.2.1.3 (10BASE-5) and section 10.3.1.3 (10BASE-2) of IEEE standard 802.3 states that a station must detect a collision, in the receive mode, if three or more stations are transmitting simultaneously. A repeater port must detect a collision when two or more stations are transmitting simultaneously. Therefore, a probe placed on a repeater port could record more collisions than a probe connected to a station on the same segment.</p> <p>Probe location plays a smaller role for 10BASE-T. Section 14.2.1.4 (10BASE-T) of IEEE standard 802.3 defines a collision as the simultaneous presence of signals on the DO and RD circuits (transmitting and receiving at the same time). A 10BASE-T station can only detect collisions when it is transmitting. Therefore, probes placed on a station and a repeater should report the same number of collisions. An RMON probe inside a repeater should ideally report collisions between the repeater and one or more other hosts (transmit collisions as defined by IEEE 802.3k) plus receiver collisions observed on any coax segments to which the repeater is connected.</p> |
| rfc1757_StatsDropEvents | 1757 | The total number of events in which packets were dropped by the probe due to a lack of resources. This represents the number of times the condition was detected, which does not necessarily equal the number of dropped packets. |

| Name | RFC | Description |
|-----------------------------------|------|---|
| rfc1757_StatsFragments | 1757 | The total number of packets received that were less than 64 octets in length (excluding framing bits, but including FCS octets) and had either a bad FCS with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). It is entirely normal for etherStatsFragments to increment, because it counts both runts (which are normal occurrences due to collisions) and noise hits. |
| rfc1757_StatsJabbers | 1757 | The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and had either a bad FCS with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). This definition of jabber is different than the definition in IEEE-802.3 section 8.2.1.5 (10BASE5) and section 10.3.1.4 (10BASE2). These documents define jabber as the condition where any packet exceeds 20 ms. The allowed range to detect jabber is between 20 ms and 150 ms. |
| rfc1757_StatsMulticastPkts | 1757 | The total number of good packets received that were directed to a multicast address. This number does not include packets directed to the broadcast address. |
| rfc1757_StatsOctets | 1757 | The total number of octets of data (including those in bad packets) received on the network (excluding framing bits, but including FCS octets). This object can be used as a reasonable estimate of Ethernet utilization. For greater precision, sample the etherStatsPkts and etherStatsOctets objects before and after a common interval. The differences in the sampled values are Pkts and Octets, respectively, and the number of seconds in the interval is Interval. These values are used to calculate the Utilization as follows: $\text{Utilization} = [\text{Pkts} * (9.6 + 6.4) + (\text{Octets} * .8)] / \text{Interval} * 10,000$ The result of this equation is the value Utilization, which is the percent utilization of the Ethernet segment on a scale of 0 to 100 percent. |
| rfc1757_StatsOversizePkts | 1757 | The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed |
| rfc1757_StatsPkts | 1757 | The total number of packets (including bad packets, broadcast packets, and multicast packets) received |
| rfc1757_StatsPkts1024to1518Octets | 1757 | The total number of packets (including bad packets) received that were between 1024 and 1518 octets in length inclusive (excluding framing bits, but including FCS octets) |
| rfc1757_StatsPkts128to255Octets | 1757 | The total number of packets (including bad packets) received that were between 128 and 255 octets in length inclusive (excluding framing bits, but including FCS octets) |
| rfc1757_StatsPkts256to511Octets | 1757 | The total number of packets (including bad packets) received that were between 256 and 511 octets in length inclusive (excluding framing bits, but including FCS octets) |
| rfc1757_StatsPkts512to1023Octets | 1757 | The total number of packets (including bad packets) received that were between 512 and 1023 octets in length inclusive (excluding framing bits, but including FCS octets) |
| rfc1757_StatsPkts64Octets | 1757 | The total number of packets (including bad packets) received that were 64 octets in length (excluding framing bits, but including FCS octets) |

| Name | RFC | Description |
|--------------------------------|------|---|
| rfc1757_StatsPkts65to127Octets | 1757 | The total number of packets (including bad packets) received that were between 65 and 127 octets in length inclusive (excluding framing bits, but including FCS octets) |
| rfc1757_StatsTXNoErrors | 1757 | All packets transmitted without error, not including oversized packets |
| rfc1757_StatsUndersizePkts | 1757 | The number of packets received during the sampling interval that were less than 64 octets long (excluding framing bits, but including FCS octets) and were otherwise well formed |
| rfc2233_IfHCInBroadcastPkts | 2233 | The number of packets, delivered by this sublayer to a higher sublayer, that were addressed to a broadcast address at this sublayer. This object is a 64-bit version of ifInBroadcastPkts. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2233_IfHCInMulticastPkts | 2233 | The number of packets, delivered by this sublayer to a higher sublayer, that were addressed to a multicast address at this sublayer. For a MAC layer protocol, this includes both Group and Functional addresses. This object is a 64-bit version of ifInMulticastPkts. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2233_IfHCInOctets | 2233 | The total number of octets received on the interface, including framing characters. This object is a 64-bit version of ifInOctets. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2233_IfHCOUtUcastPkts | 2233 | The total number of packets that higher-level protocols requested to be transmitted but were not addressed to a multicast or broadcast address at this sublayer, including those packets that were discarded or not sent. This object is a 64-bit version of ifOutUcastPkts. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2233_IfHCOUtBroadcastPkts | 2233 | The total number of packets that higher-level protocols requested to be transmitted that were addressed to a broadcast address at this sublayer, including those packets that were discarded or not sent. This object is a 64-bit version of ifOutBroadcastPkts. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2233_IfHCOUtMulticastPkts | 2233 | The total number of packets that higher-level protocols requested to be transmitted that were addressed to a multicast address at this sublayer, including those packets that were discarded or not sent. For a MAC layer protocol, this includes both Group and Functional addresses. This object is a 64-bit version of ifOutMulticastPkts. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2233_IfHCOUtOctets | 2233 | The total number of octets transmitted out of the interface, including framing characters. This object is a 64-bit version of ifOutOctets. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |

| Name | RFC | Description |
|--|------|---|
| rfc2233_IfHCOutUcastPkts | 2233 | The total number of packets that higher-level protocols requested to be transmitted but were not addressed to a multicast or broadcast address at this sublayer, including those packets that were discarded or not sent. This object is a 64-bit version of ifOutUcastPkts. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3ControlInUnknownOpCodes | 2665 | The number of MAC Control frames received on the interface that contain an opcode that is not supported by the device. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3InPauseFrames | 2665 | The number of MAC Control frames received on the interface with an opcode indicating the PAUSE operation. This counter does not increment when the interface is operating in half-duplex mode. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3OutPauseFrames | 2665 | The number of MAC Control frames transmitted on the interface with an opcode indicating the PAUSE operation. This counter does not increment when the interface is operating in half-duplex mode. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsAlignmentErrors | 2665 | The number of frames received on a particular interface that are not an integral number of octets in length and do not pass the FCS check. The count represented by an instance of this object is incremented when the alignmentError status is returned by the MAC service to the LLC or other MAC user. Received frames with multiple error conditions are counted exclusively according to the error status presented to the LLC, per the conventions of IEEE 802.3 Layer Management. This counter does not increment for 8-bit wide group encoding schemes. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsCarrierSenseErrors | 2665 | The number of times that the carrier sense condition was lost or never asserted when attempting to transmit a frame on a particular interface. The count represented by an instance of this object is incremented once per transmission attempt at most, even if the carrier sense condition fluctuates during a transmission attempt. This counter does not increment when the interface is operating in full-duplex mode. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsDeferredTransmissions | 2665 | The number of frames for which the first transmission attempt on a particular interface is delayed because the medium is busy. The count represented by an instance of this object does not include frames involved in collisions. This counter does not increment when the interface is operating in full-duplex mode. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |

| Name | RFC | Description |
|--|------|--|
| rfc2665_Dot3StatsExcessiveCollisions | 2665 | The number of frames for which transmission on a particular interface fails due to excessive collisions. This counter does not increment when the interface is operating in full-duplex mode. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsFCSErrors | 2665 | The number of frames received on a particular interface that are an integral number of octets in length but do not pass the FCS check. This count does not include frames received with a frame-too-long or frame-too-short error. The count represented by an instance of this object is incremented when the frameCheckError status is returned by the MAC service to the LLC or other MAC user. Received frames with multiple error conditions are counted exclusively according to the error status presented to the LLC, per the conventions of IEEE 802.3 Layer Management. Coding errors detected by the physical layer for speeds above 10 Mb/s cause the frame to fail the FCS check. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsFrameToolongs | 2665 | The number of frames received on a particular interface that exceed the maximum permitted frame size. The count represented by an instance of this object is incremented when the frameTooLong status is returned by the MAC service to the LLC or other MAC user. Received frames with multiple error conditions are counted exclusively according to the error status presented to the LLC, per the conventions of IEEE 802.3 Layer Management. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsInternalMacReceiveErrors | 2665 | The number of frames for which reception on a particular interface fails due to an internal MAC sublayer receive error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsFrameToolongs object, the dot3StatsAlignmentErrors object, or the dot3StatsFCSErrors object. The precise meaning of the count represented by an instance of this object is implementation-specific. An instance of this object can represent a count of receive errors on a particular interface that are not otherwise counted. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsInternalMacTransmitErrors | 2665 | The number of frames for which transmission on a particular interface fails due to an internal MAC sublayer transmit error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsLateCollisions object, the dot3StatsExcessiveCollisions object, or the dot3StatsCarrierSenseErrors object. The precise meaning of the count represented by an instance of this object is implementation-specific. An instance of this object can represent a count of transmission errors on a particular interface that are not otherwise counted. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |

| Name | RFC | Description |
|--|------|---|
| rfc2665_Dot3StatsLateCollisions | 2665 | The number of times that a collision is detected on a particular interface later than one slotTime into the transmission of a packet. A late collision included in a count represented by an instance of this object is also considered a generic collision for purposes of other collision-related statistics. This counter does not increment when the interface is operating in full-duplex mode. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsSQETestErrors | 2665 | The number of times that the SQE TEST ERROR message is generated by the PLS sublayer for a particular interface. The SQE TEST ERROR is set in accordance with the rules for verification of the SQE detection mechanism in the PLS Carrier Sense Function as described in IEEE Std. 802.3, 1998 Edition, section 7.2.4.6. This counter does not increment on interfaces operating at speeds greater than 10 Mb/s, or on interfaces operating in full-duplex mode. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. The object type is dot3StatsSQETestErrors. |
| rfc2665_Dot3StatsSingleCollisionFrames | 2665 | The number of successfully transmitted frames on a particular interface for which transmission is inhibited by exactly one collision. A frame that is counted by an instance of this object is also counted by the corresponding instance of either ifOutUcastPkts, ifOutMulticastPkts, or ifOutBroadcastPkts, and is not counted by the corresponding instance of the dot3StatsMultipleCollisionFrames object. This counter does not increment when the interface is operating in full-duplex mode. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |
| rfc2665_Dot3StatsSymbolErrors | 2665 | For an interface operating at 100 Mb/s, the number of times there was an invalid data symbol when a valid carrier was present. For an interface operating in half-duplex mode at 1000 Mb/s, the number of times the receiving media is non-idle (a carrier event) for a period of time equal to or greater than slotTime, and during which there was at least one occurrence of an event that caused the PHY to indicate 'Data reception error' or 'carrier extend error' on the GMII. For an interface operating in full-duplex mode at 1000 Mb/s, the number of times the receiving media is non-idle (a carrier event) for a period of time equal to or greater than minFrameSize, and during which there was at least one occurrence of an event that caused the PHY to indicate 'Data reception error' on the GMII. The count represented by an instance of this object is incremented once per carrier event at most, even if multiple symbol errors occur during the carrier event. This count does not increment if a collision is present. Discontinuities in the value of this counter can occur at reinitialization of the management system and at other times as indicated by the value of ifCounterDiscontinuityTime. |

FlexFabric FC uplink ports

| Name | RFC | Description |
|-----------------|------|--|
| fcAddressErrors | 4044 | The number of frames received with unknown addressing, such as an unknown SID or DID. The object type is fcmPortAddressErrors. |

| Name | RFC | Description |
|-------------------------|------|--|
| fcBBCreditFrameFailures | N/A | The number of times that more frames were lost during a credit recovery period than the recovery process could resolve. This causes a Link Reset to recover the credits. |
| fcBBCreditRRDYFailures | N/A | The number of Buffer-to-Buffer Credit Recovery (BBCR) Receiver Ready (R_RDY) failures. This is the number of times more R_RDYs were lost during a credit recovery period than the recovery process could resolve. This causes a Link Reset to recover the credits. |
| fcClass2RxFrames | 4044 | The number of Class 2 frames received at this port. The object type is fcmPortClass2RxFrames. |
| fcClass2TxFrames | 4044 | The number of Class 2 frames transmitted out of this port. The object type is fcmPortClass2TxFrames. |
| fcClass3Discards | 4044 | The number of Class 3 frames that were discarded upon reception at this port. The object type is fcmPortClass3Discards. |
| fcClass3RxFrames | 4044 | The number of Class 3 frames received at this port. The object type is fcmPortClass3RxFrames. |
| fcClass3TxFrames | 4044 | The number of Class 3 frames transmitted out of this port. The object type is fcmPortClass3TxFrames. |
| fcDecodeErrors | N/A | The number of errors that occurred while converting the incoming 10-bit data stream into 8-bit data for processing. An increasing value of this counter indicates a potential hardware problem between the module and the FC mezzanine SerDes settings. |
| fcFBSYFrames | 4044 | The number of times that FBSY was returned to this port as a result of a Class 2 frame that could not be delivered to the other end of the link. This can occur when either the fabric or the destination port is temporarily busy. This counter does not increment for an F_Port. The object type is fcmPortClass2RxFbsyFrames. |
| fcFRJTFrames | 4044 | The number of times that FRJT was returned to this port as a result of a Class 2 frame being rejected by the fabric. This counter does not increment for an F_Port. The object type is fcmPortClass2RxFrjtFrames. |
| fcFramesTooLong | 4044 | The number of frames received at this port for which the frame length was greater than what was agreed to in FLOGI/PLOGI. This can be caused by losing the end of frame delimiter. The object type is fcmPortFrameTooLongs. |
| fcFramesTruncated | 4044 | The number of frames received at this port for which the frame length was less than the minimum indicated by the frame header (normally 24 bytes), but it could be more if the DFCTL field indicates that an optional header should have been present. The object type is fcmPortTruncatedFrames. |
| fcInvalidCRC | 4044 | The number of frames received with an invalid CRC. This count is part of FC-PH's Link Error Status Block (LESB). The object type is fcmPortInvalidCRCs. |
| fcInvalidTxWords | 4044 | The number of invalid transmission words received at this port. This count is part of FC-PH's LESB. The object type is fcmPortInvalidTxWords. |
| fcLinkFailures | 4044 | The number of link failures. This count is part of FC-PH's LESB. The object type is fcmPortLinkFailures. |
| fcLossOfSynchronization | 4044 | The number of instances of synchronization loss detected at this port. This count is part of FC-PH's LESB. The object type is fcmPortLossOfSynchs. |
| fcNumberLinkResets | 4044 | The number of times the reset link protocol was initiated on this port. This includes the number of Loop Initialization Primitive (LIP) events on an arbitrated loop port. The object type is fcmPortLinkResets. |

| Name | RFC | Description |
|------------------------------|------------|--|
| fcNumberOfflineSequences | FCMGMT-MIB | The number of Offline Primitive sequence received at this port. This statistic is for Fibre Channel only. The object type is connUnitPortStatCountNumberOfflineSequences. |
| fcPrimitiveSeqProtocolErrors | 4044 | The number of primitive sequence protocol errors detected at this port. This count is part of FC-PH's LESB. The object type is fcmPortPrimSeqProtocolErrors. |
| fcRxByteRate | N/A | The average receive byte rate (byte/s) for a sample period of once per second |
| fcRxFrameRate | N/A | The average receive frame rate (frame/s) for a sample period of once per second |
| fcRxLinkResets | 4044 | The number of Link Reset (LR) Primitive Sequences received. The object type is fcmPortRxLinkResets. |
| fcRxOfflineSequences | 4044 | The number of Offline (OLS) Primitive Sequences received at this port. The object type is fcmPortRxOfflineSequences. |
| fcSmoothingOverflowErrors | N/A | The number of times that a violation of FC rules on the incoming signal were detected. An example of a violation is an insufficient number of idles received between the frames. |
| fcTotalRxBytes | N/A | The total number of bytes received |
| fcTotalRxFrames | N/A | The total number of frames received |
| fcTotalTxBytes | N/A | The total number of bytes transmitted |
| fcTotalTxFrames | N/A | The total number of frames transmitted |
| fcTxByteRate | N/A | The average transmit byte rate (byte/s) for a sample period of once per second |
| fcTxFrameRate | N/A | The average transmit frame rate (frame/s) for a sample period of once per second |
| fcTxLinkResets | 4044 | The number of LR Primitive Sequences transmitted. The object type is fcmPortTxLinkResets. |
| fcTxOfflineSequences | 4044 | The number of OLS Primitive Sequences transmitted by this port. The object type is fcmPortTxOfflineSequences. |

VC 8Gb 24-port FC module uplink and downlink ports

| Name | RFC | Description |
|-------------------|------------|--|
| numAddressErrors | FCMGMT-MIB | The number of frames received with unknown addressing, such as an unknown SID or DID. The SID or DID is not known to the routing algorithm. The object type is connUnitPortStatCountAddressErrors. |
| numBBCreditZero | FCMGMT-MIB | The number of transitions in or out of the BBcredit zero state. The other side does not provide any credit. The object type is connUnitPortStatCountBBCreditZero. |
| numBytesRx | N/A | The total number of bytes received |
| numBytesTx | N/A | The total number of bytes transmitted |
| numCRCErrors | FCMGMT-MIB | The number of frames received with invalid CRC. This count is part of FC-PH's LESB. Loop ports should not count CRC errors passing through when monitoring. The object type is connUnitPortStatCountInvalidCRC. |
| numClass3Discards | FCMGMT-MIB | The number of Class 3 frames discarded upon reception at this port. No FBSY or FRJT is generated for Class 3 frames, and they are discarded if they cannot be delivered. The object type is connUnitPortStatCountClass3Discards. |

| Name | RFC | Description |
|-----------------------------|------------|--|
| numEncodingDisparityErrors | FCMGMT-MIB | The number of disparity errors received at this port. The object type is connUnitPortStatCountEncodingDisparityErrors. |
| numFBSYFrames | FCMGMT-MIB | The number of times that FBSY was returned to this port as a result of a frame that could not be delivered to the other end of the link. This occurs on SOFc1 frames (the frames that establish a connection) if either the fabric or the destination port is temporarily busy. The count is the sum of all classes. The object type is connUnitPortStatCountFBSYFrames. |
| numFRJTFrames | FCMGMT-MIB | The number of times that FRJT was returned to this port as a result of a frame being rejected by the fabric. This count is the total for all classes. The object type is connUnitPortStatCountFRJTFrames. |
| numFramesTooLong | FCMGMT-MIB | The number of frames received at this port where the frame length was greater than what was agreed to in FLOGI/PLOGI. This could be caused by losing the end of frame delimiter. The object type is connUnitPortStatCountFramesTooLong. |
| numInputBuffersFull | FCMGMT-MIB | The number of times that all input buffers of a port were full and outbound buffer-to-buffer credit transitioned to zero. There is no credit to provide to other side. The object type is connUnitPortStatCountInputBuffersFull. |
| numInvalidOrderedSets | FCMGMT-MIB | The number of invalid ordered sets received at port. This count is part of FC-PH's LESB. The object type is connUnitPortStatCountInvalidOrderedSets. |
| numInvalidTransmissionWords | FCMGMT-MIB | The number of invalid transmission words received at this port. This count is part of FC-PH's LESB. The object type is connUnitPortStatCountInvalidTxWords. |
| numLRsRx | FCMGMT-MIB | The number of LR's received. This statistic is for Fibre Channel only. The object type is connUnitPortStatCountRxLinkResets. |
| numLRsTx | FCMGMT-MIB | The number of LR's transmitted. The object type is connUnitPortStatCountTxLinkResets. |
| numLinkFailures | FCMGMT-MIB | The number of link failures. This count is part of FC-PH's LESB. The object type is connUnitPortStatCountLinkFailures. |
| numLossOfSignal | FCMGMT-MIB | The number of instances of signal loss detected at this port. This count is part of FC-PH's LESB. The object type is connUnitPortStatCountLossOfSignal. |
| numLossOfSync | FCMGMT-MIB | The number of instances of synchronization loss detected at this port. This count is part of FC-PH's LESB. The object type is connUnitPortStatCountLossOfSynchronization. |
| numMcastFramesRx | FCMGMT-MIB | The number of multicast frames or packets received at this port. The object type is connUnitPortStatCountRxMulticastObjects. |
| numMcastFramesTx | FCMGMT-MIB | The number of multicast frames or packets transmitted through this port. The object type is connUnitPortStatCountTxMulticastObjects. |
| numMcastTimeouts | N/A | The number of timeouts reported for multicast frames. A single frame could cause this counter to increment if it timed out for each multiple destination. |
| numPrimitiveSeqProtocolErr | FCMGMT-MIB | The number of primitive sequence protocol errors detected at this port. This count is part of FC-PH's LESB. The object type is connUnitPortStatCountPrimitiveSequenceProtocolErrors. |
| numRxBadEOFs | N/A | The number of frames received with a badly formed end-of-frame |
| numRxCRCs | N/A | The number of CRC errors detected in received frames |

| Name | RFC | Description |
|-----------------------|------------|--|
| numRxClass1Frames | FCMGMT-MIB | The number Class 1 frames received at this port. This statistic is for Fibre Channel only. The object type is connUnitPortStatCountClass1RxFrames. |
| numRxClass2Frames | FCMGMT-MIB | The number of Class 2 frames received at this port. The object type is connUnitPortStatCountClass2RxFrames. |
| numRxClass3Frames | FCMGMT-MIB | The number of Class 3 frames received at this port. The object type is connUnitPortStatCountClass3RxFrames. |
| numRxCs | N/A | The number of link control frames received at this port |
| numRxOfflineSequences | FCMGMT-MIB | The number of Offline Primitive OLSs received at this port. The object type is connUnitPortStatCountRxOfflineSequences. |
| rxBytePeakRate | N/A | The receive max byte rate since the last reset (bytes/s) |
| rxByteRate | N/A | The receive instantaneous byte rate (bytes/s) |
| rxFramePeakRate | N/A | The receive max frame rate since the last reset (frames/s) |
| rxFrameRate | N/A | The receive instantaneous frame rate (frames/s) |
| samplingRate | N/A | This controls the rate of statistics sampling in switch ports. Polling must be frequent enough to avoid counter overflow for errors and tx/rx bytes. |
| sfpStatus | N/A | The SFP status |
| txBytePeakRate | N/A | The transmission max byte rate since the last reset (bytes/s) |
| txByteRate | N/A | The receive instantaneous byte rate (bytes/s) |
| txFramePeakRate | N/A | The transmission max frame rate since the last reset (frames/s) |
| txFrameRate | N/A | The transmission instantaneous frame rate (frames/s) |

VC 4Gb/8Gb 20-port FC module uplink and downlink ports

Statistics are not currently available for uplink or downlink ports.

Fibre Channel modules

ADDRESSERRORS

| | |
|--------------------|--|
| Object type | connUnitPortStatCountAddressErrors |
| Description | The number of frames received with unknown addresses, such as an unknown SID or DID. The SID or DID is not known to the routing algorithm. ::= { connUnitPortStatEntry 48 } |

BBCREDITZERO

| | |
|--------------------|--|
| Object type | connUnitPortStatCountBBCreditZero |
| Description | The number of transitions in or out of the BBcredit zero state. The other side does not provide any credit. ::= { connUnitPortStatEntry 8 } |

BYTESRECEIVED

| | |
|--------------------|---|
| Object type | connUnitPortStatCountRxElements |
| Description | The number of octets or bytes received by this port in 1-second periodic polling of the port. This value is saved and compared with the next polled value to compute the net throughput. For Fibre Channel, ordered sets are not included in the count. |

| | |
|--|---------------------------------|
| | ::= { connUnitPortStatEntry 7 } |
|--|---------------------------------|

BYTESTRANSMITTED

| | |
|--------------------|---|
| Object type | connUnitPortStatCountTxElements |
| Description | The number of octets or bytes transmitted by this port in 1-second periodic polling of the port. This value is saved and compared with the next polled value to compute the net throughput. For Fibre Channel, ordered sets are not included in the count. ::= { connUnitPortStatEntry 6 } |

CLASS3DISCARDS

| | |
|--------------------|--|
| Object type | connUnitPortStatCountClass3Discards |
| Description | The number of Class 3 frames discarded upon reception at this port. No FBSY or FRJT is generated for Class 3 frames, and they are discarded if they cannot be delivered. ::= { connUnitPortStatEntry 28 } |

CRCERRORS

| | |
|--------------------|--|
| Object type | connUnitPortStatCountInvalidCRC |
| Description | The number of frames received with an invalid CRC. This count is part of FC-PH's LESB. Loop ports should not count CRC errors passing through when monitoring. ::= { connUnitPortStatEntry 40 } |

DELIMITERERRORS

| | |
|--------------------|--|
| Object type | connUnitPortStatCountDelimiterErrors |
| Description | The number of invalid frame delimiters received at this port, for example, a frame with a class 2 at the start and a class 3 at the end. ::= { connUnitPortStatEntry 49 } |

ENCODINGDISPARITYERRORS

| | |
|--------------------|--|
| Object type | connUnitPortStatCountEncodingDisparityErrors |
| Description | The number of disparity errors received at this port ::= { connUnitPortStatEntry 50 } |

FBSYSFRAMES

| | |
|--------------------|---|
| Object type | connUnitPortStatCountFBSYFrames |
| Description | The number of times that FBSY was returned to this port as a result of a frame that could not be delivered to the other end of the link. This occurs on SOFc1 frames (the frames that establish a connection) if either the fabric or the destination port is temporarily busy. The count is the sum of all classes. If you cannot keep the counters by class, keep the sum counters. ::= { connUnitPortStatEntry 10 } |

FRAMESRECEIVED

| | |
|--------------------|--|
| Object type | connUnitPortStatCountRxObjects |
| Description | The number of frames, packets, IOs, and so on received by this port. A Fibre Channel frame starts with SOF and ends with EOF. FC loop devices should not count frames passed through. This value represents the sum total for all other Rx objects. ::= { connUnitPortStatEntry 5 } |

FRAMESTOOLONG

| | |
|--------------------|--|
| Object type | connUnitPortStatCountFramesTooLong |
| Description | The number of frames received at this port where the frame length was greater than what was agreed to in FLOGI/PLOGI. This could be caused by losing the end of frame delimiter. ::= { connUnitPortStatEntry 46 } |

FRAMETRANSMITTED

| | |
|--------------------|---|
| Object type | connUnitPortStatCountTxObjects |
| Description | The number of frames, packets, IOs, and so on that have been transmitted by this port. A Fibre Channel frame starts with SOF and ends with EOF. FC loop devices should not count frames passing through. This value represents the sum total for all other Tx objects. ::= { connUnitPortStatEntry 4 } |

FRJTFRAMES

| | |
|--------------------|--|
| Object type | connUnitPortStatCountFRJTFrames |
| Description | The number of times that FRJT was returned to this port as a result of a frame being rejected by the fabric. The count is the total for all classes. ::= { connUnitPortStatEntry 12 } |

INPUTBUFFERSFULL

| | |
|--------------------|---|
| Object type | connUnitPortStatCountInputBuffersFull |
| Description | The number of times that all input buffers of a port were full and the outbound buffer-to-buffer credit transitioned to zero. There is no credit to provide to the other side. ::= { connUnitPortStatEntry 9 } |

INVALIDORDEREDSETS

| | |
|--------------------|--|
| Object type | connUnitPortStatCountInvalidOrderedSets |
| Description | The number of invalid ordered sets received at a port. This count is part of FC-PH's LESB. ::= { connUnitPortStatEntry 45 } |

INVALIDTRANSMISSIONWORDS

| | |
|--------------------|--|
| Object type | connUnitPortStatCountInvalidTxWords |
| Description | The number of invalid transmission words received at this port. This number is part of FC-PH's LESB. ::= { connUnitPortStatEntry 41 } |

LINKFAILURES

| | |
|--------------------|---|
| Object type | connUnitPortStatCountLinkFailures |
| Description | The number of link failures. This number is part of FC-PH's LESB. ::= { connUnitPortStatEntry 39 } |

LINKRESETRECEIVED

| | |
|--------------------|-----------------------------------|
| Object type | connUnitPortStatCountRxLinkResets |
|--------------------|-----------------------------------|

| | |
|--------------------|--|
| Description | The number of LRs received ::= { connUnitPortStatEntry 33 } |
|--------------------|--|

LINKRESETTRANSMITTED

| | |
|--------------------|---|
| Object type | connUnitPortStatCountTxLinkResets |
| Description | The number of LRs transmitted ::= { connUnitPortStatEntry 34 } |

LOSSOF SIGNALCOUNTER

| | |
|--------------------|---|
| Object type | connUnitPortStatCountLossofSignal |
| Description | The number of instances of signal loss detected at this port. This count is part of FC-PH's LESB. ::= { connUnitPortStatEntry 43 } |

LOSSOF SYNCOUNTER

| | |
|--------------------|--|
| Object type | connUnitPortStatCountLossofSynchronization |
| Description | The number of instances of synchronization loss detected at this port. This count is part of FC-PH's LESB. ::= { connUnitPortStatEntry 44 } |

MULTICASTFRAMESRECEIVED

| | |
|--------------------|---|
| Object type | connUnitPortStatCountRxMulticastObjects |
| Description | The number of multicast frames or packets received at this port ::= { connUnitPortStatEntry 29 } |

MULTICASTFRAMESTRANSMITTED

| | |
|--------------------|---|
| Object type | connUnitPortStatCountTxMulticastObjects |
| Description | The number of multicast frames or packets transmitted through this port ::= { connUnitPortStatEntry 30 } |

PBSYFRAMES

| | |
|--------------------|---|
| Object type | connUnitPortStatCountPBSYFrames |
| Description | The number of times that PBSY was returned to this port as a result of a frame that could not be delivered to the other end of the link. This occurs on SOFc1 frames (the frames that establish a connection) if the destination port is temporarily busy. This statistic is for Fibre Channel only. This is the sum of all classes. If you cannot keep the counters by class, keep the sum counters. ::= { connUnitPortStatEntry 11 } |

PRIMITIVESEQPROTOCOLERRCOUNT

| | |
|--------------------|--|
| Object type | connUnitPortStatCountPrimitiveSequenceProtocolErrors |
| Description | The number of primitive sequence protocol errors detected at this port. This number is part of FC-PH's LESB. ::= { connUnitPortStatEntry 42 } |

PRJTFRAMES

| | |
|--------------------|---|
| Object type | connUnitPortStatCountPRJTFrames |
| Description | The number of times that FRJT was returned to this port as a result of a frame being rejected at the destination N_Port. This is the total for all classes. ::= { connUnitPortStatEntry 13 } |

RXCLASS1FRAMES

| | |
|--------------------|--|
| Object type | connUnitPortStatCountClass1RxFrames |
| Description | The number of Class 1 frames received at this port ::= { connUnitPortStatEntry 14 } |

RXCLASS2FRAMES

| | |
|--------------------|--|
| Object type | connUnitPortStatCountClass2RxFrames |
| Description | The number of Class 2 frames received at this port ::= { connUnitPortStatEntry 20 } |

RXCLASS3FRAMES

| | |
|--------------------|--|
| Object type | connUnitPortStatCountClass3RxFrames |
| Description | The number of Class 3 frames received at this port ::= { connUnitPortStatEntry 26 } |

RXOFFLINESEQUENCES

| | |
|--------------------|--|
| Object type | connUnitPortStatCountRxOfflineSequences |
| Description | The number of Offline Primitive OLSs received at this port ::= { connUnitPortStatEntry 36 } |

RXTRUNCFRAMES

| | |
|--------------------|--|
| Object type | connUnitPortStatCountFramesTruncated |
| Description | The number of frames received at this port where the frame length was less than the minimum indicated by the frame header, which is normally 24 bytes, but can be more if the DFCTL field indicates an optional header should have been present. ::= { connUnitPortStatEntry 47 } |

TXOFFLINESEQUENCES

| | |
|--------------------|---|
| Object type | connUnitPortStatCountTxOfflineSequences |
| Description | The number of Offline Primitive OLSs transmitted by this port ::= { connUnitPortStatEntry 37 } |

Configuring the Virtual Connect domain using the CLI

Basic configuration

A Virtual Connect domain consists of an enclosure and a set of associated modules and server blades that are managed together by a single instance of the VCM. The Virtual Connect domain contains specified networks, server profiles, and user accounts that simplify the setup and administration of server connections. Establishing a Virtual Connect domain enables you to upgrade, replace, or move servers within your enclosures without changes being visible to the external LAN/SAN environments.

Before getting started, perform the following tasks:

- Verify that the HP Onboard Administrator is running the latest firmware (must be v3.70 or later).
- Note the following information from the Default Network Settings label attached to the primary module:
 - DNS name
 - User name
 - Password
- Connect any Ethernet module stacking cables.



IMPORTANT: After a CLI command has completed, it can take up to 90 seconds before configuration changes are stored in persistent memory. Disruptive actions such as power cycling an I/O module within this time window can result in lost configuration changes.

The following sections provide the necessary steps to set up a basic domain.

For detailed information on a particular command, see "Managed elements (on page 18)."

Logging in to the CLI

The Virtual Connect Manager CLI can be accessed remotely through any SSH session ("[Remote access to the Virtual Connect Manager](#)" on page 13):

- SSH

```
>ssh 192.168.0.120
login as: Administrator
password:
```
- LDAP Authentication

```
>ssh 192.168.0.120
login as: <LDAP user>
password: <password>
```
- RADIUS Authentication

```
>ssh 192.168.0.120
```

```
login as: <RADIUS user>
password: <password>
```

- **TACACS+ Authentication**

```
>ssh 192.168.0.120
login as: <TACACS+ user>
password: <password>
```

- **Mechanism-based Authentication**

```
>ssh 192.168.0.120
login as: <auth-mechanism>:<username>
password: <password>
```

Valid values for auth-mechanism are local, ldap, radius, and tacacs.

For example:

```
>ssh 192.168.0.120
login as: tacacs:<TACACS+ user>
password: <password>
```

- **Role-based Authentication**

```
>ssh 192.168.0.120
login as: <role>:<username>
password: <password>
```

Valid values for role are domain, network, server, and storage.

For example:

```
>ssh 192.168.0.120
login as: network:<username>
password: <password>
```

In role-based authentication, the role authentication order configured for the specified "role" will be used.

Domain setup

After logging in to the CLI (on page 175), perform the following tasks to set up the domain:

1. Import the enclosure ("[Importing an enclosure](#)" on page 177).
2. Name the domain ("[Setting the domain name](#)" on page 177).
3. Configure local user authentication settings ("[Configuring local users](#)" on page 178).
4. Set up local user accounts and privileges ("[Configuring local users](#)" on page 178).
5. Set up authentication support for users:
 - o LDAP authentication ("[Configuring LDAP authentication support for users](#)" on page 177)
 - o RADIUS authentication ("[Configuring RADIUS authentication support for users](#)" on page 177)
 - o TACACS+ authentication ("[Configuring TACACS+ authentication support for users](#)" on page 178)
6. Set up role-based authentication ("[Configuring role-based authentication settings](#)" on page 178).
7. Set up the LACP timer ("[Configuring the LACP Timer](#)" on page 180).
8. Obtain and use a new signed certificate ("[Obtaining and using a new signed certificate](#)" on page 180).

Importing an enclosure

To import an enclosure, use the `import enclosure` command.

To enter OA credentials during import:

```
>import enclosure username=Administrator password=myPassword
```

To be prompted for a masked password:

```
>import enclosure username=Administrator  
Password=*****
```

Setting the domain name

To set the domain name, use the `set domain` command:

```
>set domain name=MyNewDomainName
```

The Virtual Connect domain name must be unique within the data center, and can be up to 31 characters without spaces or special characters.

Configuring LDAP authentication support for users

To set LDAP properties:

```
>set ldap serveraddress=192.168.0.110 enabled=true
```

To add LDAP directory groups:

```
>add ldap-group MyNewGroup description="This is my test group"  
roles=domain,server,network
```

To remove LDAP directory groups:

```
>remove ldap-group MyGroup
```

To enable or disable local users:

```
>set ldap localusers=disabled
```

To display LDAP settings and directory groups:

```
>show ldap  
>show ldap-group
```

Configuring RADIUS authentication support for users

To set RADIUS properties:

```
>set radius serveraddress=192.168.0.110 enabled=true serverkey=xyz1234
```

To add RADIUS groups:

```
>add radius-group MyNewGroup Description="Test Group" Roles=domain,server
```

To remove RADIUS groups:

```
>remove radius-group MyGroup
```

To display RADIUS settings and groups:

```
>show radius  
>show radius-group
```



IMPORTANT: The RADIUS or TACACS+ server must be set up on a host machine on the management network and configured with users and VC attributes. For more information, see the *HP Virtual Connect for c-Class BladeSystem User Guide* on the HP website (<http://www.hp.com/go/vc/manuals>).

Configuring TACACS+ authentication support for users

To set TACACS+ properties:

```
>set tacacs serveraddress=192.168.0.110 enabled=true serverkey=xyz1234
```

To display TACACS+ settings:

```
>show tacacs
```



IMPORTANT: The RADIUS or TACACS+ server must be set up on a host machine on the management network and configured with users and VC attributes. For more information, see the *HP Virtual Connect for c-Class BladeSystem User Guide* on the HP website (<http://www.hp.com/go/vc/manuals>).

Configuring role-based authentication settings

To set the authentication order:

```
>set role domain Order=ldap,radius,tacacs
```

To display the authentication order:

```
>show role domain
```

To customize role permissions:

```
>set role network operations=SupportFiles,PortMonitoring
```

Configuring local users

To configure the local user authentication settings for the VC domain:

```
>set local-users Enabled=false PrimaryRemoteAuthenticationMethod=tacacs
```

The Primary Remote Authentication Method is the primary authentication mechanism that triggers the re-enablement of local user authentication (if it was disabled) if the remote authentication servers are found to be unavailable during login by a remote VC user. Valid values include NONE, LDAP, RADIUS, and TACACS. The default value is NONE.

Configuring local users



IMPORTANT: Role operations assigned to users with Server role permissions are not available when the VC domain is under VCEM control.

To add a new user:

```
>add user bob password=fhkjdghfk roles=domain,network
```

To modify an existing user:

```
>set user bob fullname="Bob J Smith" enabled=false
```

To remove an existing user:

```
>remove user bob
```

To remove all local users except for the Administrator account:

```
>remove user *
```

To display local user information:

- Summary of all users

```
>show user
```
- Details for all users

```
>show user *
```
- Details for a single user

```
>show user steve
```

Up to 32 local user accounts can be created.

Each user account can be set up to have a combination of up to four access roles. For a list of commands that each role can execute, see "User roles (on page 149)."

- Domain
 - Define local user accounts, set passwords, define roles
 - Configure role-based user authentication
 - Import enclosures
 - Name the VC domain
 - Set the domain IP address
 - Update firmware
 - Administer SSL certificates
 - Delete the VC domain
 - Save configuration to disk
 - Restore the configuration from a backup
 - Configure SNMP settings
- Network
 - Configure network default settings
 - Select the MAC address range to be used by the VC domain
 - Create, delete, and edit networks
 - Create, delete, and edit shared uplink sets
 - Create, delete, and edit network access groups
 - Configure Ethernet SNMP settings
- Server
 - Create, delete, and edit server Virtual Connect profiles
 - Assign and unassign profiles to device bays
 - Select and use available networks
 - Select serial numbers and UUIDs to be used by server profiles
 - Power on and off server blades within the enclosure
- Storage
 - Select the WWNs to be used by the domain

- Set up the connections to the external FC Fabrics
- Configure FC SNMP settings

Additional operation permissions can be assigned to network, server, or storage roles such as configuring port monitoring or upgrading VC firmware.

It is possible to create a user with no roles. This user can only view status and settings.

Configuring the LACP Timer

To set the LACP Timer:

```
>set lacp-timer default=Long
```

To display the LACP Timer settings:

```
->show lacp-timer
```

Obtaining and using a new signed certificate

1. Generate and transfer an SSL certificate signing request (CSR) to a remote FTP server:

```
>save ssl-csr address=ftp://user:password@192.168.10.12/new-ssl.csr
CN=server.domain.com O=Hewlett-Packard C=US ST=CA L=Cupertino
email=vc-admin@domain.com
```

If the existing key is 1024 bits, a warning appears stating that a new key and certificate must be generated and the web server must be restarted. After you confirm this operation, a new key and certificate are generated and the web server restarts. The command pauses for 30 seconds to allow the web server to restart.

2. Send the CSR text to the certificate authority (CA). The CA returns a signed certificate.

3. Upload the signed certificate:

```
>load ssl-certificate
Address=ftp://user:password@192.168.10.12/new-ssl.crt
```

The file is transferred and the web server restarts.

4. To import the VCM certificate into a SIM Managed Profile, extract the certificate from the browser.

For Internet Explorer:

- a. From the Tools menu, select **Internet Options**.
- b. On the Content tab, click **Certificates**.
- c. Select the certificate you want to extract, and then click **Export**.
- d. Follow the prompts on the Certificate Export Wizard.

For Firefox:

- a. From the Tools menu, select **Options**.
- b. Click **Advanced**.
- c. On the Security tab, click **View Certificates**.
- d. Select the certificate you want to extract, and then click **Backup**.
- e. Follow the on-screen prompts.

Network setup

To establish external Ethernet network connectivity for the HP BladeSystem c-Class enclosure:

1. Identify the MAC addresses to be used on the server blades deployed within this Virtual Connect domain.
2. Set up connections from the HP BladeSystem c-Class enclosure to the external Ethernet networks.
These connections can be uplinks dedicated to a specific Ethernet network or shared uplinks that carry multiple Ethernet networks with the use of VLAN tags.

Configuring MAC address ranges

To configure MAC address ranges, use the `set domain` command.

To use VC-defined MAC addresses:

```
>set domain MacType=VC-Defined MacPool=10
```

To use factory-default MAC addresses:

```
>set domain MacType=Factory-Default
```

To set user-defined MAC addresses:

```
>set domain MacType=User-Defined MacStart=00-17-A4-77-00-00  
MacEnd=00-17-A4-77-00-FF
```



IMPORTANT: Configuring Virtual Connect to assign server blade MAC addresses requires careful planning to ensure that the configured range of MAC addresses is used once within the environment. Duplicate MAC addresses on an Ethernet network can result in a server network outage.

Each server blade Ethernet NIC ships with a factory default MAC address. The MAC address is a 48-bit number that uniquely identifies the Ethernet interface to other devices on the network. While the hardware ships with default MAC addresses, Virtual Connect can assign MAC addresses that override the factory default MAC addresses while the server remains in that Virtual Connect enclosure.

Always establish control processes to ensure that a unique MAC address range is used in each Virtual Connect domain in the environment. Reusing address ranges could result in server network outages caused by multiple servers having the same MAC addresses.

If using Virtual Connect assigned MAC addresses, the following notes apply:

- Virtual Connect automatically assigns two MAC addresses to each VC-Enet connection in the server profile, a primary address for the Ethernet NIC, and an iSCSI MAC address for use by multifunction gigabit server adapters, such as the HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter. Only the primary MAC address is used by standard (not multifunction) Ethernet devices.
- If a server blade is moved from a Virtual Connect managed enclosure to a non-Virtual Connect enclosure, the local MAC addresses on that server blade are automatically returned to the original factory defaults.
- If a server blade is removed from a bay within a Virtual Connect domain and installed in another bay in the same Virtual Connect domain or in a bay in a different domain, it is assigned the new set of addresses appropriate for that server location.
- When FlexFabric adapters are in use, Virtual Connect assigns a MAC address to each FCoE connection in the server profile.

- When iSCSI connections are used, Virtual Connect assigns a MAC address to each iSCSI connection in the profile.

Assigned MAC addresses

The MAC address range used by the Virtual Connect domain must be unique within the environment. HP provides a set of pre-defined ranges that are for use by VCM and do not conflict with server factory default MAC addresses.

When using the HP-defined MAC address ranges, be sure that each range is used only once within the environment.

Selecting VC-assigned MAC address ranges

When using VC-assigned MAC addresses, you can choose between using an HP pre-defined MAC address range or using a user-defined MAC address range.

- HP pre-defined MAC address range (recommended). These pre-defined ranges are reserved and are not the factory default on any hardware. There are 64 ranges of 1024 unique addresses to choose from. Be sure to use each range only once within a data center.
1024 unique addresses might not be enough for a large configuration (multiple enclosures with many Flex-10 NICs). If you plan a domain of this type, determine the number of MAC addresses you are likely to use, and then select an option that provides the domain with sufficient MAC addresses.
- User-defined MAC address range. To avoid potential conflict with other hardware MAC addresses in the environment, consider using a subrange of MAC addresses reserved by the IEEE for locally-administered MAC addresses. Ensure that the range does not conflict with any Ethernet device already deployed within the enterprise.



IMPORTANT: If you plan to use Insight Control Server Deployment for RedHat Linux installation and also plan to use User- or HP-defined MAC addresses, you must import the enclosure and assign profiles before running Insight Control Server Deployment.

NOTE: After any server profiles are deployed using a selected MAC address range, that range cannot be changed until all server profiles are deleted.

Creating a network access group

Before VC 3.30, any server profile could be assigned any set of networks. If policy dictated that some networks should not be accessed by a system that accessed other networks (for example, the Intranet and the Extranet) there was no way to enforce that policy automatically.

With VC 3.30 and later, network access groups are defined by the network administrator and associated with a set of networks that can be shared by a single server. Each server profile is associated with one network access group. A network cannot be assigned to the server profile unless it is a member of the network access group associated with that server profile. A network access group can contain multiple networks.

Up to 128 network access groups are supported in the domain. Ethernet networks and server profiles that are not assigned to a specific network access group are added to the domain Default network access group automatically. The Default network access group is predefined by VCM and cannot be removed or renamed.

If you are updating to VC 3.30 or later, all current networks are added to the Default network access group and all server profiles are set to use the Default network access group. Network communication within the

Default network access group behaves similarly to earlier versions of VC firmware, because all profiles can reach all networks.

If you create a new network access group, NetGroup1, and move existing networks from the Default network access group to NetGroup1, then a profile that uses NetGroup1 cannot use networks included in the Default network access group. Similarly, if you create a new network and assign it to NetGroup1 but not to the Default network access group, then a profile that uses the Default network access group cannot use the new network.

To create a network access group, use the `add network-access-group` command:

```
>add network-access-group MyGroupName
```

The network access group name must be unique within the data center, and can be up to 64 characters without spaces or special characters except for ".", "-", and "_".

Modifying network access groups

To modify network access groups, use the `set network-access-group` command:

```
>set network-access-group NetGroup1 Name=NewNetGroupName
```

- To add additional network members to the network access group, use the `add nag-network` command:

```
>add nag-network nag=NetGroup1 network=Net3,Net4,Net5
```
- To remove specified network members from the network access group, use the `remove nag-network` command:

```
>remove nag-network nag=NetworkGroup1 network=Net4,Net5
```

Displaying network access groups

To display network access groups, use the `show network-access-group` command:

- Summary for all network access groups

```
>show network-access-group
```
- Details for all network access groups

```
>show network-access-group *
```
- Details for a network access group

```
>show network-access-group MyGroupName
```

To display the members of network access groups, use the `show nag-network` command:

```
>show nag-network *
```

Creating an Ethernet network

To create a new Ethernet network, use the `add network` command:

```
>add network MyNetworkName
```

The network name must be unique within the data center, and can be up to 64 characters without spaces or special characters.

Modifying Ethernet network properties

To modify Ethernet network properties, use the `set network` command:

```
>set network MyNetworkName state=enabled name=NewName smartlink=enabled  
ConnectionMode=Auto LacpTimer=Domain-Default
```

Displaying Ethernet networks

To display Ethernet network properties, use the `show network` command:

- Summary of all networks
`>show network`
- Details for all networks
`>show network *`
- Details for a single network
`>show network MyNetwork`

Adding Ethernet networks to a network access group

To add existing network access groups to an existing network, use the `add nag-network` command:

```
>add nag-network Nag=DatabaseNetGroup Network=Net1,Net2
```

The networks become members of the specified network access group in addition to all the previously configured network access groups.

To modify the network access groups of an existing network, use the `set network` command:

```
>set network Net1 nags=NetGroup1,NetGroup2
```

The specified network now belongs to the specified network access groups and is no longer the member of previously configured network access groups.

Creating an Ethernet network that uses network access groups

To create a network that is assigned to network access groups DatabaseNetGroup and AccessNetGroup, use the `add network` command:

```
>add network Network1 nags=DatabaseNetGroup,AccessNetGroup
```

Adding uplink ports to an Ethernet network

To add uplink ports to an existing Ethernet network, use the `add uplinkport` command:

```
>add uplinkport enc0:1:1 network=MyNetwork
```

Modifying uplink port properties

To modify an uplink port that exists as a member of a network or shared uplink set, use the `set uplinkport` command:

```
>set uplinkport network=Network1 speed=1Gb
```

Creating a shared uplink set

To create a shared uplink set, use the `add uplinkset` command:

```
>add uplinkset MyUplinkSetName
```

A shared uplink set identifies VC-Enet module uplinks that carry multiple networks over the same cable or set of cables. In this case, each Ethernet packet carries a VLAN tag (IEEE 802.1Q) to identify the specific network to which it belongs. On shared uplinks, the VLAN tags are added when packets leave the VC-enabled enclosure and are removed when packets enter the enclosure. The external Ethernet switch and VCM must be configured to use the same VLAN tag identifier (a number between 1 and 4094) for each network.

Virtual Connect places no special restrictions on which VLAN identifiers can be used, so the VLAN IDs already used for the networks in the data center can be used on these shared uplinks. To configure a shared uplink set for VLAN tagging, obtain a list of the network names and their VLAN IDs.

A shared uplink set enables multiple ports to be included to support port aggregation and link failover with a consistent set of VLAN tags.

Because VLAN tags are added or removed when Ethernet packets leave or enter the VC-Enet shared uplink, the VLAN tags have no relevance after the Ethernet packet enters the enclosure.

Identifying an associated network as the native VLAN causes all untagged incoming Ethernet packets to be placed onto this network. Only one associated network can be designated as the native VLAN. All outgoing Ethernet packets are VLAN-tagged.

Modifying shared uplink sets

To modify shared uplink sets, use the `set uplink` command:

```
>set uplinkset UplinkSet-1 ConnectionMode=Auto LacpTimer=Long
```

Displaying shared uplink sets

To display shared uplink sets, use the `show uplinkset` command:

- Summary for all shared uplink sets
`>show uplinkset`
- Details for all shared uplink sets
`>show uplinkset *`
- Details for a single shared uplink set
`>show uplinkset MyUplinkSetName`

Adding uplink ports to a shared uplink set

To add uplink ports to a shared uplink set, use the `add uplinkport` command:

```
>add uplinkport enc0:1:2 uplinkset=MyUplinkSetName
```

Creating a network that uses a shared uplink set

To create a network that uses a shared uplink set, use the `add network` command:

```
>add network MyNewNetworkName uplinkset=MyUplinkSetName vlanid=156
```

Creating multiple networks that use a shared uplink set

To create multiple networks that use a shared uplink set, use the `add network-range` command:

```
>add network-range UplinkSet=SUS1 VLANIds=156-160
```

Server VLAN Tagging Support

Each server port can be connected to multiple virtual networks, each using a unique server VLAN ID for virtual network mapping.

The translation of Server VLAN tags to internal network VLAN and again to external data center VLAN tags, and the reverse, on incoming and outgoing frames can result in a configuration where the server VLANs might not match the external VLANs used on uplinks. To avoid this scenario, the server connections can be

forced to use the same VLAN mappings as the shared uplink sets. Setting the value to "true" restricts the server network connections to be selected from a single shared uplink, and the VLAN ID cannot be modified:

```
>set enet-vlan SharedServerVlanID=true
```

Setting the value to "false" enables you to select any VC Ethernet network for the server Ethernet connections, and VLAN ID mappings can be modified to ensure uniqueness:

```
>set enet-vlan SharedServerVlanID=false
```

When using mapped VLAN tags, the overall link speed can be controlled as follows:

```
>set enet-vlan PrefSpeedType=Custom PrefSpeed=500 MaxSpeedType=Custom  
MaxSpeed=2500
```

Fibre Channel setup

To configure external Fibre Channel connectivity for the HP BladeSystem c-Class enclosure:

1. Identify WWNs to be used on the server blades deployed within this Virtual Connect domain.
2. Create FC SAN fabrics ("[Creating FC fabrics](#)" on page 187).

Configuring WWN address ranges

Each server blade FC HBA mezzanine card ships with factory default port and node WWNs for each FC HBA port. Each WWN is a 64-bit number that uniquely identifies the FC HBA port/node to other devices on the network. While the hardware ships with default WWNs, Virtual Connect has the ability to assign WWNs that override the factory default WWNs while the server remains in that Virtual Connect enclosure. When configured to assign WWNs, Virtual Connect securely manages the WWNs by accessing the physical FC HBA through the enclosure Onboard Administrator and the iLO interfaces on the individual server blades.

When assigning WWNs to FC HBA ports, Virtual Connect assigns both a port WWN and a node WWN. Because the port WWN is typically used for configuring fabric zoning, it is the WWN displayed throughout the Virtual Connect user interface. The assigned node WWN is always the same as the port WWN incremented by one.

Virtual Connect assigns or migrates WWNs for server FC ports connected to HP Virtual Connect modules. Virtual Connect also assigns WWNs to FC ports that are not connected to an I/O module because Virtual Connect modules can be added later. Server FC ports connected to non-Virtual Connect modules retain the server factory default WWNs.

Configuring Virtual Connect to assign WWNs in server blades maintains a consistent storage identity (WWN) even when the underlying server hardware is changed. This method allows server blades to be replaced without affecting the external Fibre Channel SAN administration.



CAUTION: To avoid storage networking issues and potential loss of data associated with duplicate WWNs on a FC SAN fabric, plan carefully when allowing Virtual Connect to assign server blade WWNs so that the configured range of WWNs is used only once within the environment.

The WWN range used by the Virtual Connect domain must be unique within the environment. HP provides a set of pre-defined ranges that are reserved for use by Virtual Connect and do not conflict with server factory default WWNs.

When using the HP-defined WWN ranges, be sure that each range is used only once within the environment.

To configure WWN address ranges, use the `set domain` command:

- VC-defined

```
>set domain WwnType=VC-Defined WwnPool=5
```

- Factory default

```
>set domain WwnType=Factory-Default
```

Creating FC fabrics

To create a FabricAttach FC SAN fabric and add it to the domain, use the `add fabric` command:

```
>add fabric MyFabric2 Bay=3 Ports=1 Speed=2Gb
```

To create a DirectAttach fabric for a FlexFabric module and add it to the domain, use the `add fabric` command:

```
>add fabric MyFabric5 Bay=3 Ports=1,2 Type=DirectAttach
```

For more information about Virtual Connect fabrics, see the *HP Virtual Connect for c-Class BladeSystem User Guide* on the HP website (<http://www.hp.com/go/vc/manuals>).

Displaying FC fabrics

To display a list of all FC SAN fabrics, use the `show fabric` command:

```
>show fabric
```

Serial number settings

The serial number settings feature enables you to add a serial number and UUID to server profiles. The UUIDs that Virtual Connect assigns are randomly generated. A UUID pool is not required.

By configuring VCM to assign serial numbers, a profile can present a single serial number regardless of the physical server. With these configuration values added to server profiles, software that is licensed to a particular server, based on one or both of these values, can be migrated to new server hardware without re-licensing the software for the new server hardware. This feature prevents you from having to reinstall serial number sensitive software after a system recovery.

If you need to access the physical serial number of a server blade, the Onboard Administrator displays both the physical and assigned serial numbers.

After server profile creation, the following guidelines apply:

- Serial numbers can be changed from factory default to VC-assigned.
- Factory default serial numbers cannot be changed.
- User-defined serial number ranges can be expanded.
- User-defined serial number ranges cannot be reduced.



CAUTION: The use of Serial Number Settings might prevent the proper operation of software designed to track servers by serial number or UUID. Do not enable this feature until you consider and understand the impact to the entire software environment in which the servers operate. This impact includes, but is not limited to, warranty service, asset tracking, server deployment, and software licensing.

Configuring serial number ranges

To configure serial number ranges, use the `set serverid` command:

- VC-defined
`>set serverid Type=VC-Defined PoolId=5`
- Factory default
`>set serverid Type=Factory-Default`

When using the HP-defined serial number ranges, be sure that each range is used only once within the environment.

Server profile setup

The I/O connection profile, or server profile, provides a link between the server and the networks and fabrics defined in VC. The server profile can include MAC and WWN addresses, as well as boot parameters for the various connection protocols supported by VC. After being defined, the server profile can be assigned to any server blade within the Virtual Connect domain. VCM supports up to 256 profiles within the domain.

A Virtual Connect server profile consists of connections that group attributes related to server connectivity for the various protocols supported by Virtual Connect modules. These protocols are Ethernet, iSCSI, Fibre Channel over Ethernet (FCoE), and Fibre Channel.

- For Ethernet connections, VC provides the ability to assign VC-assigned MAC addresses and configure PXE boot settings as well as allocate bandwidth on Flex-10 connections.
- For iSCSI connections, VC provides the ability to assign VC-assigned MAC addresses and configure iSCSI boot settings as well as allocate bandwidth. This protocol is only available on Flex-10 server ports that support iSCSI.
- For FCoE connections, VC provides the ability to assign VC-assigned WWN and MAC addresses and configure Fibre Channel boot settings and bandwidth. This protocol is only available on FlexFabric server connections.
- For FC connections, VC provides the ability to assign VC-assigned WWN addresses and configure Fibre Channel boot settings.



IMPORTANT: The term server blade also applies to HP Integrity multi-blade servers. For more information on multi-blade servers, see the *HP Virtual Connect Manager for c-Class BladeSystem User Guide* on the HP website (<http://www.hp.com/go/vc/manuals>).

When a server profile is assigned to a server blade, VCM configures the connections with the appropriate MAC/WWN addresses and boot settings. USE BIOS is an option for all connection boot settings that preserves the options set in the RBSU or through other configuration utilities. Virtual Connect Manager automatically connects the server blade Ethernet, iSCSI, FCoE, and Fibre Channel ports to the specified networks and SAN fabrics. This server profile can then be re-assigned to another server blade as needed, while maintaining the server's network and SAN identity and connectivity.

VCM can be configured so that server blades use server factory default MACs/WWNs or Virtual Connect-administered MACs/WWNs. These administered values override the default MAC addresses and WWNs when a server profile is assigned to a server, and appear to pre-boot environments and the host operating system software as the hardware addresses. To use administered MAC/WWN addresses, select a range of HP pre-defined or user-specified MAC addresses.

Review the following list of guidelines before creating and deploying server profiles:



IMPORTANT: Before assigning a profile, unassigning a profile, or modifying a profile, be sure to review the "Server blade power on and power off guidelines (on page 195)."

- The server blade firmware and option card firmware must be at a revision that supports Virtual Connect profile assignment. See the HP website (<http://www.hp.com/go/bladesystemupdates>).
- Before creating the first server profile, do the following:
 - Select whether to use assigned serial numbers or factory default serial numbers.
 - Select whether to use movable, VC-administered MAC addresses and WWNs, or the local server blade factory default MAC addresses and WWNs.
- After an enclosure is imported into a Virtual Connect domain, server blades are isolated from the networks and SAN fabrics until a server profile is created and assigned.
- Server blades must be powered off to receive or relinquish a server profile assignment when using Virtual Connect-administered MAC addresses or WWNs, or when changing Fibre Channel boot parameters. When using Flex-10 or FlexFabric modules, there are special considerations for server power.
- When assigning a VC-assigned serial number, the server must be powered off.
- FC SAN connections appear in server profile screens only when an HP Virtual Connect Fibre Channel module is in the enclosure managed by Virtual Connect. FC SAN connections are added in pairs and cannot be deleted. If an HP Virtual Connect Fibre Channel module is added to a Virtual Connect domain with existing profiles, an option to add FC connections appears when editing existing profiles.
- FCoE connections appear in server profile screens only when an HP VC Flex Fabric 10Gb/24-port Module, HP VC FlexFabric-20/40 F8 Module, or HP VC Flex-10/10D Module is in the enclosure managed by Virtual Connect. FCoE SAN connections are added in pairs. If either of these modules is added to a Virtual Connect domain with existing profiles, you can add FCoE connections.
- iSCSI connections are not added to server profiles by default. You must add one or more iSCSI connections. The GUI enables the creation of iSCSI connections only if at least one Flex-10 or FlexFabric module exists in the domain. The CLI can be used to pre-provision this feature. iSCSI and FCoE connections cannot share the same physical Flex-10 port since they use the same physical function.
- Some server profile SAN boot settings (controller boot order) are applied by Virtual Connect only after the server blade has been booted at least once with the final mezzanine card configuration.
- If PXE, controller boot order, or SAN boot settings are made outside of Virtual Connect using RBSU or other configuration tools, Virtual Connect restores the settings defined by the server profile after the server blade completes the next boot cycle.
- After Virtual Connect assigns a server profile to a server, RBSU cannot modify the protocol configuration (iSCSI/FCoE) for any NIC, including the NC551m, even if the NIC is not connected to a Virtual Connect module. Any protocol configuration changes must be made before the server profile is assigned to the server.
- To boot properly from SAN when using Linux and VMware ESX 3.0.1 and ESX 3.0.2, change the QLogic QMH2462 4Gb FC HBA connection option to 'point-to-point only' in the QLogic BIOS configuration utility. The Emulex LPe 1105-HP 4Gb FC HBA does not require using the 'point-to-point' connection option to boot properly from SAN.
- If the VC domain is configured for double-dense server mode and a profile is assigned to an empty server bay, a hot-plug installation of a single-dense server into that server bay results in the profile not being activated. To recover the profile, unassign the profile, and then reassign it.
- During a profile assignment, if the port number of an existing fabric has been changed to another physical port, the fabric and the domain go into a failed state until the reconfiguration is complete. This also might result in SNMP traps being sent to report the interim failed state.

Server profiles are associated with a specific enclosure device bay. After a profile is assigned, the Virtual Connect Manager configures the server blade in that device bay with the appropriate MAC, PXE, WWN, and SAN boot settings and connects the appropriate networks and fabrics. Server blades that have been assigned a profile and remain in the same device bay do not require further Virtual Connect Manager configuration during a server or enclosure power cycle. They boot and gain access to the network and fabric when the server and interconnect modules are ready.

If a server blade is installed in a device bay already assigned a server profile, Virtual Connect Manager automatically updates the configuration of that server blade before it can power on and connect to the network.

If a server blade is moved from a Virtual Connect-managed enclosure to a non-Virtual Connect enclosure, the MAC addresses and WWNs for the blade are automatically returned to the original factory defaults. This feature prevents duplicate MAC addresses and WWNs from appearing in the data center because of a server blade redeployment.

Creating server profiles

To create a new server profile, use the `add profile` command:

```
>add profile MyNewProfile
```

To copy the configuration from one profile to another profile, use the following command:

```
>copy ExistingProfile MyNewProfile
```

After an enclosure is imported into a Virtual Connect domain, server blades that have not been assigned a server profile are isolated from all networks to ensure that only properly configured server blades are attached to data center networks.

A server profile can be assigned and defined for each device bay so that the server blade can be powered on and connected to a deployment network. These profiles can then later be modified or replaced by another server profile.

A server profile can also be assigned to an empty bay to enable deployment at a later date.

Adding Ethernet network connections to a profile

To add a new Ethernet network connection to an existing server profile, use the `add enet-connection` command:

```
>add enet-connection MyProfile network=MyNetwork pxe=enabled
```

To add a multiple network Ethernet connection on a server port, use the following commands:

```
>add enet-connection MyProfile pxe=enabled
>add server-port-map MyProfile:1 MyNetwork VlanID=100
>add server-port-map-range MyProfile:1 VlanIds=151-170,215
```

If the domain setting for `SharedServerVlanID` is set to `true`, then the `VlanID` property cannot be modified. Instead, the name of the shared uplink set with which the network is associated is required.

```
>add server-port-map MyProfile:1 MyNetwork Uplinkset=MyUplinkset
```

Adding iSCSI connections to a profile

To add a new iSCSI connection to an existing server profile, use the `add iscsi-connection` command:

```
>add iscsi-connection MyProfile network=MyNetwork speedType=custom
speed=2000
```

To configure the boot parameters for the iSCSI connection, use the `set iscsi-boot-param` command as follows:

```
>set iscsi-boot-param MyProfile1:1 BootOrder=Primary Lun=100
InitiatorName="iqn.2009-09.com.someorg.iSCSI-Initiator"
InitiatorIp=192.128.3.1 Mask=255.255.0.0
TargetName="iqn.2009-09.com.someorg.iSCSI-Target" TargetIp=192.128.3.2
TargetPort=40000 Authentication=CHAP Username=SomeUserName
Secret=SomePassword123
```

Adding FC fabric connections to a server profile

To add a new FC SAN connection to an existing server profile, use the `add fc-connection` command:

```
>add fc-connection MyProfile fabric=SAN_5
```

For more information, see "General requirements for adding FC or FCoE connections (on page 197)."

Adding FCoE connections to a profile

To add a new FCoE connection to an existing server profile, use the `add fcoe-connection` command:

```
>add fcoe-connection MyNewProfile Fabric=SAN_1 SpeedType=Custom
CustomSpeed=5000
```

To configure the boot parameters for the FCoE connection, use the `set fcoe-connection` command:

```
>set fcoe-connection MyNewProfile:1 BootPriority=Primary
BootPort=50:06:0B:00:00:C2:62:00 BootLun=5
```

For more information, see "General requirements for adding FC or FCoE connections (on page 197)."

Adding a network access group to a profile

To create a new profile and assign an existing network access group, use the `add profile` command:

```
>add profile MyNewProfile2 Nag=DatabaseNetGroup
```

To modify the network access group of an existing server profile, use the `set profile` command:

```
>set profile Profile1 Nag=NetGroup1
```

Assigning a server profile to a device bay

To assign a server profile to a specific device bay, use the `assign profile` command:

```
>assign profile MyProfile enc0:1
```

When defining server profiles in a multi-enclosure configuration, profiles can be assigned to server bays in any of the enclosures that have been added and imported into the domain.

When a profile is created and assigned to a multi-blade server, the profile is applied to all of the blades in the multi-blade server. Be sure that the profile contains enough Ethernet and Fibre Channel connection entries for all of the ports on all of the blades in the multi-blade server.

Configuring IGMP settings



IMPORTANT: Users with server role permissions cannot modify IGMP settings when the VC domain is under VCEM control.

To configure Ethernet IGMP snooping settings, use the `set igmp` command:

```
>set igmp Enabled=true Timeout=30
```

The IGMP Snooping feature enables VC-Enet modules to monitor (snoop) the IGMP IP multicast membership activities and configure hardware Layer 2 switching behavior of multicast traffic to optimize network resource usage. IGMP v1, v2, and v3 snooping are supported.

The IGMP Snooping idle timeout interval is set to 260 seconds by default. This value is the "Group Membership Interval" value as specified by IGMP v2 specification (RFC2236). For optimum network resource usage, set the interval to match the configuration on the customer network's multicast router settings.

By default, unregistered IGMP multicast traffic traversing VC-Enet modules is flooded on the configured Ethernet network. To prevent flooding, set the NoFlood property to true.

```
>set igmp Enabled=true NoFlood=true
```

Unregistered multicast traffic from uplinks is dropped and traffic from the server ports is redirected to the active uplink port. IGMP Snooping must be enabled to modify this setting.

For more information about multicast filters, see "mcast-filter (on page 72)."

Configuring MAC cache failover settings

- To configure MAC Cache Failover settings, use the `set mac-cache` command:

```
>set mac-cache enabled=true refresh=10
```

- To display MAC Cache Failover settings, use the `show mac-cache` command:

```
>show mac-cache
```

When a VC-Enet uplink that was previously in standby mode becomes active, external Ethernet switches can take several minutes to recognize that the c-Class server blades can now be reached on this newly active connection. Enabling Fast MAC Cache Failover causes Virtual Connect to transmit Ethernet packets on newly active links, which enables the external Ethernet switches to identify the new connection and update their MAC caches appropriately. This transmission sequence repeats a few times at the MAC refresh interval (HP recommends 5 seconds) and completes in about 1 minute.

Virtual Connect only transmits MAC Cache update frames on VLANs that have been configured in the VC domain. The update frames are VLAN tagged appropriately for networks defined on shared uplink sets. For dedicated networks, only untagged update frames are generated, regardless of whether or not VLAN Tunneling is enabled. In a VLAN tunnel, all customer VLAN tags pass through Virtual Connect transparently. Virtual Connect does not examine nor record VLAN tag information in tunneled networks; therefore, it cannot generate tagged update frames.



IMPORTANT: Be sure to set switches to allow MAC addresses to move from one port to another without waiting for an expiration period or causing a lock out.

Always enable the "spanning tree portfast" feature to allow the switch port to bypass the "listening" and "learning" stages of spanning tree and quickly transition to the "forwarding" stage, allowing edge devices to immediately begin communication on the network.

Configuring network loop protection settings

The loop-protect command has been deprecated in VC 4.00 and higher. HP recommends using the port-protect command.

To enable network loop protection, use the `set port-protect` command:

```
>set port-protect networkLoop=Enabled
```

To reset all ports disabled due to the port protection action, use the `reset port-protect` command:

```
>reset port-protect
```


For more information about the port-protect command, see "port-protect (on page 87)." For more information about configuring the port-protect setting, see "Configuring pause flood protection settings."

The deprecated command to enable network loop protection is:

```
>set loop-protect Enabled=true
```

The deprecated command to reset network loop protection is:

```
>reset loop-protect
```

To avoid network loops, Virtual Connect first verifies that only one active uplink exists per network from the Virtual Connect domain to the external Ethernet switching environment. Then, Virtual Connect makes sure that no network loops are created by the stacking links between Virtual Connect modules.

- One active link—A VC uplink set can include multiple uplink ports. To prevent a loop with broadcast traffic coming in one uplink and going out another, only one uplink or uplink LAG is active at a time. The uplink or LAG with the greatest bandwidth should be selected as the active uplink. If the active uplink loses the link, then the next best uplink is made active.
- No loops through stacking links—If multiple VC-Enet modules are used, they are interconnected using stacking links, which might appear as an opportunity for loops within the VC environment. For each individual network in the Virtual Connect environment, VC blocks certain stacking links to ensure that each network has a loop-free topology.

Enhanced network loop protection detects loops on downlink ports, which can be a Flex-10 logical port or physical port. The feature applies to Flex-10 logical function if the Flex-10 port is operating under the control of DCC protocol. If DCC is not available, the feature applies to a physical downlink port.

Enhanced network loop protection uses two methods to detect loops:

- It periodically injects a special probe frame into the VC domain and monitors downlink ports for the looped back probe frame. If this special probe frame is detected on downlink ports, the port is considered to cause the loop condition.

For tunneled networks, the probe frame transmission is extended over a longer period of time proportional to the number of tunneled networks. The probe frames are sent on a subset of tunnels every second until all tunnels are serviced.

- It monitors and intercepts common loop detection frames used in other switches. In network environments where the upstream switches send loop detection frames, the VC Enet modules must ensure that any downlink loops do not cause these frames to be sent back to the uplink ports. Even though VC probe frames ensure loops are detected, there is a small time window depending on the probe frame transmission interval in which the loop detection frames from the external switch might loop through down link ports and reach uplink ports. By intercepting the external loop detection frames on downlinks, the possibility of triggering loop protection on the upstream switch is eliminated. When network loop protection is enabled, VC-Enet modules intercept the following types of loop detection frames:
 - PVST+ BPDUs
 - Procurve Loop Protect frames

When the network loop protection feature is enabled, any probe frame or other supported loop detection frame received on a downlink port is considered to be causing the network loop, and the port is disabled immediately until an administrative action is taken. The administrative action involves resolving the loop condition and clearing the loop protection error condition. The "loop detected" status on a port can be cleared by one of the following administrative actions:

- Restart loop detection by issuing "reset" loop protection from the CLI or GUI.

- Unassign all networks from the port in "loop detected" state.

The SNMP agent supports trap generation when a loop condition is detected or cleared.

Virtual Connect provides the ability to enable or disable network loop protection. The feature is enabled by default and applies to all VC-Enet modules in the domain. Network loops are detected and server ports can be disabled even prior to any enclosure being imported.

A loop-protect reset command resets and restarts loop detection for all server ports in a "loop-detected" error condition.

Configuring pause flood protection settings

To enable pause flood protection, use the `set port-protect` command:

```
set port-protect [-quiet] [networkLoop=<Enabled|Disabled>]
[pauseFlood=<Enabled|Disabled>]
```

To reset all ports disabled due to the port protection action, use the `reset port-protect` command:

```
>reset port-protect
```

Ethernet switch interfaces use pause frame-based flow control mechanisms to control data flow. When a pause frame is received on a flow control enabled interface, the transmit operation is stopped for the pause duration specified in the pause frame. All other frames destined for this interface are queued up. If another pause frame is received before the previous pause timer expires, the pause timer is refreshed to the new pause duration value. If a steady stream of pause frames is received for extended periods of time, the transmit queue for that interface continues to grow until all queuing resources are exhausted. This condition severely impacts the switch operation on other interfaces. In addition, all protocol operations on the switch are impacted because of the inability to transmit protocol frames. Pause frames and priority-based pause frames can cause the same resource exhaustion condition.

VC provides the ability to monitor server downlink ports, module uplink ports, and stacking links for pause flood conditions:

- If a pause flood condition is detected on a server downlink port, VC can take protective action by disabling the flooded port if pause flood protection is enabled.
- If a pause flood condition is detected on a stacking link or an uplink port, VC only reports that the pause flood condition was detected.

When the pause flood protection feature is enabled, this feature detects pause flood conditions on server downlink ports and disables the port. This feature operates at the physical port level. The port remains disabled until an administrative action is taken. When a pause flood condition is detected on a Flex-10 physical port, all Flex-10 logical ports associated with physical ports are disabled.

The administrative action involves the following steps:

1. Resolve the issue with the NIC on the server causing the continuous pause generation.

This might include updating the NIC firmware and device drivers. For information on firmware updates, see the server support documentation.

Rebooting the server might not clear the pause flood condition if the cause of the pause flood condition is in the NIC firmware. In this case, the server must be completely disconnected from the power source to reset the NIC firmware. To perform a server reboot with power disconnection:

- a. Shut down the server.
- b. Log in to Onboard Administrator with Administrator privileges using the OA CLI.
- c. Enter the command `reset server x`, where [x=bay number].

- d. Confirm that you want to reset the server blade.
2. Re-enable the disabled ports on the VC interconnect modules using one of the following methods:
 - o Click **Re-enable Ports** in the GUI.
 - o Use the "reset port-protect" CLI command.

Virtual Connect provides the ability to enable or disable port pause flood protection. The feature is enabled by default and applies to all VC-Enet modules in the domain. Port pause floods are detected and server ports can be disabled even prior to any enclosure being imported.

The default polling interval is 10 seconds and is not customer configurable. VC provides system logs and SNMP traps for events related to pause flood detection. The SNMP agent supports trap generation when a pause flood condition is detected or cleared.

Hiding unused FlexNICs in a profile

To hide unused FlexNICs in a new server profile, use the `add profile` command with the `HideUnusedFlexNICs` property:

```
->add profile MyNewProfile2 HideUnusedFlexNICs=true
```

To hide unused FlexNICs in an existing server profile, use the `set profile` command with the `HideUnusedFlexNICs` property:

```
->set profile Profile1 HideUnusedFlexNICs=true
```

When you hide unused FlexNICs in an existing server profile, the operating system does not enumerate physical functions of FlexNICs not mapped to profile connections as network interfaces. This might change the order of network interfaces in the operating system and require manual adjustments to NIC teaming or other network configurations in the operating system to restore network connectivity.

Changing this option requires you to power off the server.

Server blade power on and power off guidelines

Certain server profile changes require the server blade in the device bay to be powered down before the changes are made. HP recommends using the server console to power down the server before attempting to use the Virtual Connect Manager.

Server-side settings modified by a VC server profile requires the server blade to be powered down before profile settings are applied. Network or fabric changes do not require the server blade to be powered down. Server-side settings include the following:

- Assigning a VC or user-defined MAC address
- Changing the PXE setting
- Assigning a VC-defined WWN
- Changing the Fibre Channel boot parameters
- Changing boot parameters
- Adding or deleting a connection of any kind
- Changing the FlexNIC enumeration setting on a profile

If the server blade is not powered down, a message appears and no changes are made.

If server-side settings are changed, the following operations require that server blade is powered down:

- Assigning a profile to a server blade already installed in a device bay

- Deleting a profile, moving a profile to a different device bay, or unassigning a profile from the existing bay
- Making modifications to a profile that affect settings on the server blade; for example, PXE enable/disable, changing the number of connections, or changing Fibre Channel boot parameters
- Resetting the server blade to factory defaults from the RBSU

If the server blade is reset to factory defaults from the RBSU, perform the following:

- a. Power down the server blade using the Momentary Press option.
- b. Re-apply the VC server profile.
- c. Power up the server.

The following operations do not require the server blade to be powered down:

- Changing the network connected to an already defined Ethernet port
- Changing the Fabric connected to a Fibre Channel port
- Changing the speed of a Fibre Channel port
- Assigning or unassigning server profiles, if server factory defaults are used for MAC addresses and WWNs, BIOS Fibre Channel boot settings are used, and PXE is not being enabled or disabled (USE BIOS for all network connections).

Exceptions for Flex-10 and FlexFabric 20 connection changes are specified in the following sections.

Flex-10 and FlexFabric 20 connection changes that require power down

Always power down server blades with Flex-10 connections in the following instances:

- Adding a connection that is mapped to a Flex-10 or FlexFabric 20
- Removing a connection that is mapped to a Flex-10 or FlexFabric 20
- Assigning a profile to a server that maps Flex-10 or FlexFabric 20 connections
- Unassigning a profile with Flex-10 or FlexFabric 20 connections

Flex-10 connection changes that do not require power down

With Virtual Connect v2.10 and higher, it is not necessary to power down a server blade with Flex-10 connections in the following instances:

- Changing a connection's network:
 - From a single network to another single network
 - From a single network to multiple networks
 - From multiple networks to a single network
- Modifying the networks or VLAN IDs in a connection with multiple networks

With Virtual Connect v2.30 and higher, it is not necessary to power down a server blade with Flex-10 connections in the following instances:

- Changing a connection's network:
 - From "unassigned" to a single network
 - From a single network to "unassigned"
 - From "unassigned" to multiple networks
 - From multiple networks to "unassigned"

- Changing the requested bandwidth

FCoE connection changes that require power down

- Adding an FCoE connection to an assigned server profile
- Removing an FCoE connection from an assigned server profile
- Assigning a profile containing FCoE connections to a server
- Changing FCoE boot parameters

Restart after OA credential recovery

The state "profile recovered," is applied to servers that are powered up when VC Manager restarts after an OA credential recovery. When VC Manager detects a restart after a credential recovery, it rewrites the profile parameters for any server that is powered up, connects the server to the appropriate Ethernet networks and FC fabrics, and then puts the server and profile in the "profile recovered" state. The server and profile remain in the "profile recovered" state until the server is powered down or removed from the enclosure. This feature eliminates the power cycle requirement for a server to recover.

General requirements for adding FC or FCoE connections

Adding FC and FCoE connections is generally allowed during profile add and edit operations. It is not allowed in some specific cases. Observe the following general requirements:

- When a profile is added, the FC/FCoE connections initially displayed are based on the FC/FCoE module configuration in the domain. A pair of horizontally adjacent FC/FCoE-capable modules has two connections.
- Connections can only be added or removed from the bottom. You can only add or delete connections at the end of the list.
- You can remove connections at any time (one at a time, from the bottom).
- If the existing profile connections do not match the current FC/FCoE module configurations, the add operation is not allowed.
- The current maximum number of per server profile FC/FCoE connections mapped to the same I/O bay is four, unless you are using the HP Integrity BL890c i4 Server Blade.
 - When FlexFabric modules exist in I/O bays 1 and 2, there can be an additional eight FCoE connections that will get mapped to LOMs 3 and 4 on the blades in an Integrity BL890c i4 server. The BL890c i4 server has CNA LOMs, which enable two FCoE connections to I/O bay 1 (from LOMs 1 and 3) and two FCoE connections to I/O bay 2 (from LOMs 2 and 4).

The following table lists several scenarios that describe how adding FC/FCoE connections affects an existing profile. The scenarios are true for FC module configurations and FC modules, as well as FCoE module configurations and FCoE-capable modules.

| Scenario | Description | Existing profile connections | | Current FC module configurations | | Adding profile connections | |
|----------|--|------------------------------|--------------|----------------------------------|-------|----------------------------|--------------|
| 1 | Start with modules in Bays 3 and 4, create a profile, then edit the profile and add connections. | Port | Connected to | — | — | Port | Connected to |
| | | 1 | Bay 3 | Bay 3 | Bay 4 | 1 | Bay 3 |
| | | 2 | Bay 4 | — | — | 2 | Bay 4 |
| | | | | — | — | 3 | Bay 3 |
| | | | | | | 4 | Bay 4 |
| | | | | | | Add connection, 2 times | |

| 2 | Start with modules in Bays 3–6, create a profile, then edit the profile and add connections. | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 3</td></tr><tr><td>2</td><td>Bay 4</td></tr><tr><td>3</td><td>Bay 5</td></tr><tr><td>4</td><td>Bay 6</td></tr></table> | Port | Connected to | 1 | Bay 3 | 2 | Bay 4 | 3 | Bay 5 | 4 | Bay 6 | <table><tr><td>—</td><td>—</td></tr><tr><td>Bay 3</td><td>Bay 4</td></tr><tr><td>Bay 5</td><td>Bay 6</td></tr><tr><td>—</td><td>—</td></tr></table> | — | — | Bay 3 | Bay 4 | Bay 5 | Bay 6 | — | — | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 3</td></tr><tr><td>2</td><td>Bay 4</td></tr><tr><td>3</td><td>Bay 5</td></tr><tr><td>4</td><td>Bay 6</td></tr><tr><td>5</td><td>Bay 3</td></tr><tr><td>6</td><td>Bay 4</td></tr><tr><td>7</td><td>Bay 5</td></tr><tr><td>8</td><td>Bay 6</td></tr></table> <p>Add connection, 4 times</p> | Port | Connected to | 1 | Bay 3 | 2 | Bay 4 | 3 | Bay 5 | 4 | Bay 6 | 5 | Bay 3 | 6 | Bay 4 | 7 | Bay 5 | 8 | Bay 6 |
|-------|---|--|------|--------------|---|-------|---|-------|---|-------|---|-------|---|-------|-------|-------|-------|---|-------|--------------|---|---|------|--------------|-------|-------|-------|-------|-------|--|---|-------|---|-------|---|-------|---|-------|---|-------|
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 3 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 5 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Start with modules in Bays 3 and 4, create a profile, install modules into Bays 5 and 6, then edit the profile and add connections. | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 3</td></tr><tr><td>2</td><td>Bay 4</td></tr></table> | Port | Connected to | 1 | Bay 3 | 2 | Bay 4 | <table><tr><td>—</td><td>—</td></tr><tr><td>Bay 3</td><td>Bay 4</td></tr><tr><td>Bay 5</td><td>Bay 6</td></tr><tr><td>—</td><td>—</td></tr></table> | — | — | Bay 3 | Bay 4 | Bay 5 | Bay 6 | — | — | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 3</td></tr><tr><td>2</td><td>Bay 4</td></tr><tr><td>3</td><td>Bay 5</td></tr><tr><td>4</td><td>Bay 6</td></tr></table> <p>Add connection, 2 times</p> | Port | Connected to | 1 | Bay 3 | 2 | Bay 4 | 3 | Bay 5 | 4 | Bay 6 | | | | | | | | | | | | |
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Bay 3 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 5 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Start with modules in Bays 3 and 4, create a profile (add 2 connections), install modules into Bays 5 and 6, then edit the profile. | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 3</td></tr><tr><td>2</td><td>Bay 4</td></tr><tr><td>3</td><td>Bay 3</td></tr><tr><td>4</td><td>Bay 4</td></tr></table> | Port | Connected to | 1 | Bay 3 | 2 | Bay 4 | 3 | Bay 3 | 4 | Bay 4 | <table><tr><td>—</td><td>—</td></tr><tr><td>Bay 3</td><td>Bay 4</td></tr><tr><td>Bay 5</td><td>Bay 6</td></tr><tr><td>—</td><td>—</td></tr></table> | — | — | Bay 3 | Bay 4 | Bay 5 | Bay 6 | — | — | <p>Add connection is disallowed because the current FC module configurations do not match the existing connections in the profile.</p> <p>This profile is not useful after the hot-plug install. To resolve this issue, delete connections 3 and 4, save the profile, and then scenario 3 applies.</p> | | | | | | | | | | | | | | | | | | |
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Bay 3 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 5 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Start with modules in Bays 3–6, create a profile, install modules into Bays 7 and 8, then edit the profile and add connections. | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 3</td></tr><tr><td>2</td><td>Bay 4</td></tr><tr><td>3</td><td>Bay 5</td></tr><tr><td>4</td><td>Bay 6</td></tr></table> | Port | Connected to | 1 | Bay 3 | 2 | Bay 4 | 3 | Bay 5 | 4 | Bay 6 | <table><tr><td>—</td><td>—</td></tr><tr><td>Bay 3</td><td>Bay 4</td></tr><tr><td>Bay 5</td><td>Bay 6</td></tr><tr><td>Bay 7</td><td>Bay 8</td></tr></table> | — | — | Bay 3 | Bay 4 | Bay 5 | Bay 6 | Bay 7 | Bay 8 | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 3</td></tr><tr><td>2</td><td>Bay 4</td></tr><tr><td>3</td><td>Bay 5</td></tr><tr><td>4</td><td>Bay 6</td></tr><tr><td>5</td><td>Bay 7</td></tr><tr><td>6</td><td>Bay 8</td></tr></table> <p>Add connection, 2 times</p> | Port | Connected to | 1 | Bay 3 | 2 | Bay 4 | 3 | Bay 5 | 4 | Bay 6 | 5 | Bay 7 | 6 | Bay 8 | | | | |
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Bay 3 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 5 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 7 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 5 | Bay 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Start with modules in Bays 3–6, create a profile (add 4 connections), install modules into Bays 7 and 8, then edit the profile. | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 3</td></tr><tr><td>2</td><td>Bay 4</td></tr><tr><td>3</td><td>Bay 5</td></tr><tr><td>4</td><td>Bay 6</td></tr><tr><td>5</td><td>Bay 3</td></tr><tr><td>6</td><td>Bay 4</td></tr><tr><td>7</td><td>Bay 5</td></tr><tr><td>8</td><td>Bay 6</td></tr></table> | Port | Connected to | 1 | Bay 3 | 2 | Bay 4 | 3 | Bay 5 | 4 | Bay 6 | 5 | Bay 3 | 6 | Bay 4 | 7 | Bay 5 | 8 | Bay 6 | <table><tr><td>—</td><td>—</td></tr><tr><td>Bay 3</td><td>Bay 4</td></tr><tr><td>Bay 5</td><td>Bay 6</td></tr><tr><td>Bay 7</td><td>Bay 8</td></tr></table> | — | — | Bay 3 | Bay 4 | Bay 5 | Bay 6 | Bay 7 | Bay 8 | <p>Add connection is disallowed because the current FC module configurations do not match the existing connections in the profile.</p> <p>This profile is not useful after the hot-plug install. To resolve this issue, delete connections 5–8, save the profile, and then scenario 5 applies.</p> | | | | | | | | | | |
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Bay 3 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 5 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 7 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Start with modules in Bays 5 and 6, create a profile, install modules into Bays 3 and 4, then edit the profile. | <table><tr><th>Port</th><th>Connected to</th></tr><tr><td>1</td><td>Bay 5</td></tr><tr><td>2</td><td>Bay 6</td></tr></table> | Port | Connected to | 1 | Bay 5 | 2 | Bay 6 | <table><tr><td>—</td><td>—</td></tr><tr><td>Bay 3</td><td>Bay 4</td></tr><tr><td>Bay 5</td><td>Bay 6</td></tr><tr><td>—</td><td>—</td></tr></table> | — | — | Bay 3 | Bay 4 | Bay 5 | Bay 6 | — | — | <p>Add connection is disallowed because the current FC module configurations do not match the existing connections in the profile.</p> <p>To make this profile useful, remove the two connections, save the profile, and then begin adding connections.</p> | | | | | | | | | | | | | | | | | | | | | | |
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Bay 3 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 5 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|-------|---|--|------|--------------|---|-------|---|-------|---|-------|-------|-------|---|-------|---|-------|-------|--|-------|--------------|---|--|-------|-------|-------|-------|-------|-------|-------|---|------|--------------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|-------|----|-------|
| 8 | Start with modules in Bays 5–8, create a profile, install modules into Bays 3 and 4, then edit the profile. | <table><tr><td>Port</td><td>Connected to</td></tr><tr><td>1</td><td>Bay 5</td></tr><tr><td>2</td><td>Bay 6</td></tr><tr><td>4</td><td>Bay 7</td></tr><tr><td>5</td><td>Bay 8</td></tr></table> | Port | Connected to | 1 | Bay 5 | 2 | Bay 6 | 4 | Bay 7 | 5 | Bay 8 | <table><tr><td>—</td><td>—</td></tr><tr><td>Bay 3</td><td>Bay 4</td></tr><tr><td>Bay 5</td><td>Bay 6</td></tr><tr><td>Bay 7</td><td>Bay 8</td></tr></table> | — | — | Bay 3 | Bay 4 | Bay 5 | Bay 6 | Bay 7 | Bay 8 | Add connection is disallowed because the current FC module configurations do not match the existing connections in the profile. To make this profile useful, remove the two connections, save the profile, and then begin adding connections. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Bay 3 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 5 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 7 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Start with FCoE-capable modules in Bays 1 and 2, then create a profile and add connections. | <table><tr><td>Port</td><td>Connected to</td></tr><tr><td>1</td><td>Bay 1</td></tr><tr><td>2</td><td>Bay 2</td></tr></table> | Port | Connected to | 1 | Bay 1 | 2 | Bay 2 | <table><tr><td>Bay 1</td><td>Bay 2</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr></table> | Bay 1 | Bay 2 | — | — | — | — | — | — | <table><tr><td>Port</td><td>Connected to</td></tr><tr><td>1</td><td>Bay 1</td></tr><tr><td>2</td><td>Bay 2</td></tr><tr><td>3</td><td>Bay 1</td></tr><tr><td>4</td><td>Bay 2</td></tr><tr><td>5</td><td>Bay 1</td></tr><tr><td>6</td><td>Bay 2</td></tr><tr><td>7</td><td>Bay 1</td></tr><tr><td>8</td><td>Bay 2</td></tr></table> Add connection, 6 times* | Port | Connected to | 1 | Bay 1 | 2 | Bay 2 | 3 | Bay 1 | 4 | Bay 2 | 5 | Bay 1 | 6 | Bay 2 | 7 | Bay 1 | 8 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 2 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 1 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 5 | Bay 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Bay 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Bay 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 1 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 3 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 5 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bay 7 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bay 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Bay 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Bay 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Bay 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Bay 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Bay 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Bay 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Bay 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Bay 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Bay 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Bay 3** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Bay 4** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Bay 5** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Bay 6** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Bay 7** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Bay 8** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Bay 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Bay 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* Using the BL890c i4 server blade, an additional eight connections can still be added. Each pair is connect to bays 1 and 2. The first four pairs of entries are mapped to LOM 1 and LOM 2 on each blade, and the last four pairs of entries are mapped to LOM 3 and LOM 4 on each blade.

** Not mapped

Logging out of the CLI

To log out of the CLI, use the exit command:

```
>exit
```

Common management operations

The following table provides the syntax for the most commonly used management operations.

For more information on a particular command, see "Managed elements (on page 18)."

| Operation | Examples |
|--|---|
| Display general domain settings | >show domain |
| Display predefined address pools | >show domain addresspool |
| Display interconnect modules | <ul style="list-style-type: none">• Summary display >show interconnect• Detailed display >show interconnect *• Single module display >show interconnect enc0:2 |
| Display overall domain status | >show status |
| Display stacking link configuration and status | >show stackinglink |
| Display the system log | >show systemlog |
| Display a list of servers in the domain | <ul style="list-style-type: none">• Summary display >show server• Detailed display >show server *• Single server display >show server enc0:1 |
| Display server profiles | <ul style="list-style-type: none">• Summary display >show profile• Detailed display >show profile *• Single profile display >show profile MyProfile |
| Delete the domain configuration | >delete domain |
| Force a failover to the backup VC Manager | >reset vcm - failover |
| Power off server blades | >poweroff server enc0:2 >poweroff server * |
| Power on server blades | >poweron server enc0:1 >poweron server * |
| Reset a server blade | >reboot server enc0:4 >reboot server * |
| Unassign a server profile from a device bay | >unassign profile MyProfile |
| Modify Ethernet network connection properties | >set enet-connection MyProfile 1 pxe=disabled |
| Modify FC fabric connections | >set fc-connection MyProfile 2 speed=auto |

Port status conditions

If a port status is unlinked and no connectivity exists, one of the following appears:

- **Not Linked/E-Key**—The port is not linked because of an electronic keying error. For example, a mismatch in the type of technology exists between the server and module ports.
- **Not Logged In**—The port is not logged in to the remote device.
- **Incompatible**—The port is populated with an SFP module that does not match the usage assigned to the port, such as a FC SFP connected to a port designated for Ethernet network traffic. A port that is not assigned to a specific function is assumed to be designated for Ethernet network traffic.

An FCoE-capable port that has an SFP-FC module connected not assigned to a fabric or network is designated for a network, and the status is "Incompatible." When a fabric is created on that port, the status changes to "Linked."

- **Unsupported**—The port is populated with an SFP module that is not supported. For example:
 - An unsupported module is connected.
 - A 1Gb or 10Gb Ethernet module is connected to a port that does not support that speed.
 - An LRM module is connected to a port that is not LRM-capable.
 - An FC module is connected to a port that is not FC-capable.
- **Administratively Disabled**—The port has been disabled by an administrative action, such as setting the uplink port speed to 'disabled.'
- **Unpopulated**—The port does not have an SFP module connected.
- **Unrecognized**—The SFP module connected to the port cannot be identified.
- **Failed Validation**—The SFP module connected to the port failed HPID validation.
- **Smart Link**—The Smart Link feature is enabled.
- **Not Linked/Loop Protected**—VCM is intercepting BPDU packets on the server downlink ports and has disabled the server downlink ports to prevent a loop condition.
- **Not Linked/Flood Protected**—VCM has detected a pause flood condition on a Flex-10 physical port and has disabled all Flex-10 logical ports associated with the physical port.
- **Linked/Non-HP**—The port is linked to another port, but the connected SFP module is not certified by HP to be fully compatible. In this case, the SFP module might not work properly. Use certified modules to ensure server traffic.
- **Not Linked/Pause Flood Detected**—VCM has detected a pause flood condition.
- **Covered**—Reported for subports Q1.2 through Q1.4 when the QSFP+ port is populated with a QSFP+ DAC/AOC cable, rather than a 4x10Gb splitter cable.

Resetting the Virtual Connect Manager

To reset the Virtual Connect Manager, use the `reset vcm` command:

```
>reset vcm
>reset vcm [-failover]
```

Administrator privileges are required for this operation.

If VC Ethernet modules are configured for redundancy using a primary and backup Ethernet module, you can use this feature to manually change which Virtual Connect Ethernet module hosts the Virtual Connect Manager. You can also force the Virtual Connect Manager to restart without switching to the alternate Virtual Connect Ethernet module. This feature can be useful when troubleshooting the Virtual Connect Manager. The network and FC processing of the Virtual Connect subsystem is not disturbed during the restart or failover of the Virtual Connect Manager.

If the command line option `-failover` is included in the `reset vcm` command and a backup Virtual Connect Ethernet module is available, the command line displays the following message:

```
SUCCESS: The Virtual Connect Manager is being reset. Please wait...
```

You are logged out of the session after approximately 1 minute. An attempted login to the same Virtual Connect Ethernet module is rejected with the following message:

```
Virtual Connect Manager not found at this IP address.
```

If you attempt to log in to the backup module, you might receive the following error message:

```
Unable to communicate with the Virtual Connect Manager. Please retry again later.
```

The login should succeed after the Virtual Connect Manager restarts on the backup Virtual Connect Ethernet module. Allow up to 5 minutes, depending on the enclosure configuration.

If the command line option `-failover` is not included in the `reset vcm` command or a backup Virtual Connect Ethernet module is not available, the command line displays the following message:

```
SUCCESS: The Virtual Connect Manager is being reset. Please wait...
```

You are logged out of the session after approximately 1 minute. If you attempt to log in to the module again, you might receive the following error message:

```
Unable to communicate with the Virtual Connect Manager. Please retry again later.
```

The login should succeed after the Virtual Connect Manager restarts. Allow up to 5 minutes, depending on the enclosure configuration.

Support and other resources

Before you contact HP

Be sure to have the following information available before you call HP:

- Active Health System log (HP ProLiant Gen8 or later products)
Download and have available an Active Health System log for 7 days before the failure was detected. For more information, see the *HP iLO 4 User Guide* or *HP Intelligent Provisioning User Guide* on the HP website (<http://www.hp.com/go/ilo/docs>).
- Onboard Administrator SHOW ALL report (for HP BladeSystem products only)
For more information on obtaining the Onboard Administrator SHOW ALL report, see the HP website (<http://www.hp.com/go/OAlog>).
- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Product identification number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP contact information

For United States and worldwide contact information, see the Contact HP website (<http://www.hp.com/go/assistance>).

In the United States:

- To contact HP by phone, call 1-800-334-5144. For continuous quality improvement, calls may be recorded or monitored.
- If you have purchased a Care Pack (service upgrade), see the Support & Drivers website (<http://www8.hp.com/us/en/support-drivers.html>). If the problem cannot be resolved at the website, call 1-800-633-3600. For more information about Care Packs, see the HP website (<http://pro-aq-sama.houston.hp.com/services/cache/10950-0-0-225-121.html>).

Acronyms and abbreviations

BPDU

Bridge Protocol Data Unit

CHAP

Challenge Handshake Authentication Protocol

CHAPM

Mutual Challenge Handshake Authentication Protocol

CRC

cyclic redundant checks

DCBX

Datacenter Bridging Capability Exchange protocol

DCC

device control channel

DHCP

Dynamic Host Configuration Protocol

DNS

domain name system

EFI

extensible firmware interface

FC

Fibre Channel

FCoE

Fibre Channel over Ethernet

FCS

Frame Check Sequence

FIPS

Federal Information Processing Standard

GMII

Gigabit media independent interface

HBA

host bus adapter

IGMP

Internet Group Management Protocol

iSCSI

Internet Small Computer System Interface

LDAP

Lightweight Directory Access Protocol

LESB

Link Error Status Block

LLC

Logical Link Control

LLDP

Link Layer Discovery Protocol

LUN

logical unit number

MAC

Media Access Control

NPIV

N_Port ID Virtualization

OA

Onboard Administrator

PVST+

Per VLAN Spanning Tree (over standard 802.1q links)

PXE

preboot execution environment

RADIUS

Remote Authentication Dial-In User Service

RD

receive data

RMON

remote monitoring

SMI-S

Storage Management Initiative Specification

SOAP

Simple Object Access Protocol

SSH

Secure Shell

SSL

Secure Sockets Layer

TACACS+

Terminal Access Controller Access Control System Plus

TFTP

Trivial File Transfer Protocol

TLV

Type-Length Value

UDP

User Datagram Protocol

UUID

universally unique identifier

VC

Virtual Connect

VCEM

Virtual Connect Enterprise Manager

VCM

Virtual Connect Manager

VCSU

Virtual Connect Support Utility

VLAN

virtual local-area network

WWN

World Wide Name

WWPN

worldwide port name

Documentation feedback

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