



Asset Inventory CMDB Sync App

User Guide

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About this guide

Welcome to Qualys Cloud Platform! We'll show you how to use the Qualys Asset Inventory CMDB Sync App to synchronize Qualys IT asset discovery and classification with the ServiceNow Configuration Management Database (CMDB) system.

About Qualys

Qualys, Inc. (NASDAQ: QLYS) is a pioneer and leading provider of cloud-based security and compliance solutions. The Qualys Cloud Platform and its integrated apps help businesses simplify security operations and lower the cost of compliance by delivering critical security intelligence on demand and automating the full spectrum of auditing, compliance and protection for IT systems and web applications.

Founded in 1999, Qualys has established strategic partnerships with leading managed service providers and consulting organizations including Accenture, BT, Cognizant Technology Solutions, Deutsche Telekom, Fujitsu, HCL, HP Enterprise, IBM, Infosys, NTT, Optiv, SecureWorks, Tata Communications, Verizon and Wipro. The company is also a founding member of the [Cloud Security Alliance \(CSA\)](#). For more information, please visit www.qualys.com

Qualys Support

Qualys is committed to providing you with the most thorough support. Through online documentation, telephone help, and direct email support, Qualys ensures that your questions will be answered in the fastest time possible. We support you 7 days a week, 24 hours a day. Access support information at www.qualys.com/support/

Welcome to Qualys Asset Inventory CMDB Sync

The Qualys Asset Inventory CMDB Sync App (Qualys App) for Configuration Management Database (CMDB) automatically synchronizes comprehensive information about your global IT resources that are continuously monitored by Qualys Asset Inventory. This leverages Qualys' highly distributed and scalable cloud platform, and various data collection tools, including Qualys' groundbreaking Cloud Agents, to compile and continually update a full inventory of your IT assets everywhere: on premises, in elastic clouds and mobile endpoints.

Key Features

- Asset information is automatically enriched with additional context such as lifecycle date and support stage, license category
- For assets that already exist in both, asset metadata can be synchronized
- Optionally, asset information is staged for user approval before being written to CMDB
- Support for multiple Qualys accounts/API sources
- Synchronization schedules can be configured and saved
- Preconfigured table transform maps for open ports, assets, network interfaces, software, processors and volumes
- Preconfigured reports

Pre-requisites

You must have a valid Qualys Account subscription with API Access and access to following modules:

- Qualys Subscription with Global IT Asset Inventory (Qualys to ServiceNow Sync)
- Asset Inventory CMDB Sync enabled within your Qualys subscription (Qualys to ServiceNow Sync)
- Vulnerability Management (ServiceNow to Qualys Sync)

Get Started

Here we'll help you with the initial configuration and setup needed to get started.

Quick Steps

[Install the App](#) - You'll get the app from the ServiceNow app store.

[Add API Source](#) - Provide the API Source details and use Test Connection to know if the connection between ServiceNow and the defined source is working fine.

[Create Schedules](#) - Provide details to create a schedule. Once a schedule is successfully created, the sync between the source and CMDB gets working as per the schedule.

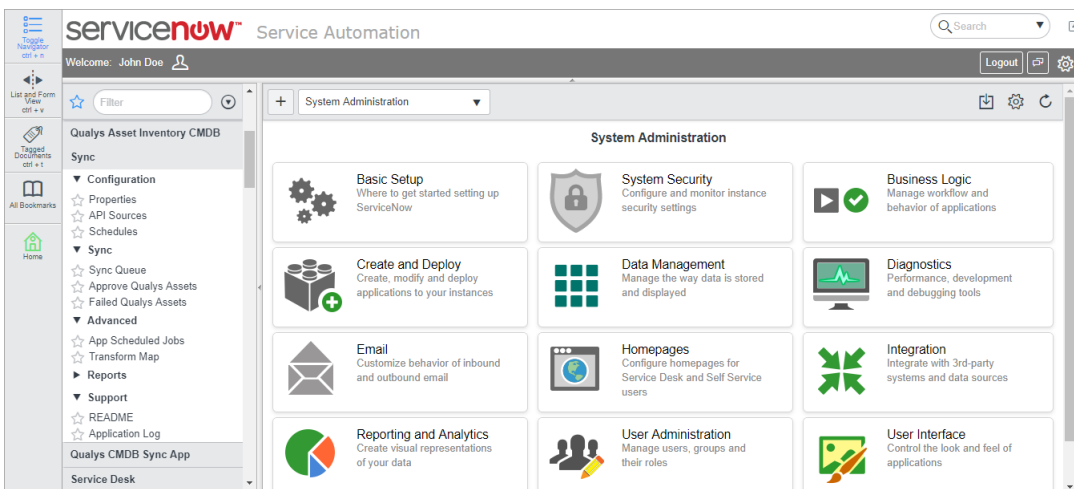
[Update Properties](#) - The Properties have pre-defined values, however you can always update a property to better suit your needs.

Install the App

Visit the [ServiceNow Online Store](#).

Search for Qualys Asset Inventory CMDB Sync App, and click Contact Seller. Your Technical Account Manager (TAM) will contact you, and then ServiceNow provisions the app into an instance of your choice. The app then appears in the "Downloads" list of your instance. Click "Install" to start using the app.

In the Search field, type Asset Inventory, and then select Qualys Asset Inventory CMDB Sync App from the left pane. After you are done, new module appears in your ServiceNow instance that looks like this:



Add API Source

Once you install the Qualys App, you need to add the API source. Go to Qualys Asset Inventory CMDB Sync App > Configuration > API Sources, and click New.

The screenshot shows the 'Qualys API Credentials' configuration page. At the top right, there are 'Submit' and 'Test Connection' buttons, which are circled in red. The form contains the following fields and options:

- Name:** Sample Source
- POD:** Qualys India Platform 1
- Username:** jdoe
- Password:** (masked with dots)
- Active:** ☒
- Created:** (empty field)
- Updated:** (empty field)
- Enable Qualys to ServiceNow Sync?** ☒
- Enable ServiceNow to Qualys Sync?** ☒
- Qualys to ServiceNow Sync Count:** (empty field)
- ServiceNow to Qualys Sync Count:** (empty field)
- Sync Asset Tag/ Asset Group:** (expanded section)
 - Sync Asset Tags:** ☒
 - Sync Asset Groups:** ☒
 - Asset Tags Last Sync:** (empty field)
 - Asset Groups Last Sync:** (empty field)
- Submit** and **Test Connection** buttons (circled in red at the bottom left).
- Related Links:** [Test Connection](#)

Enter required details to create the source:

Name - Provide a name for the API source.

POD - Click and select the valid Qualys POD.

Username and **Password** - Enter valid Qualys Cloud Platform credentials with API access enabled for the account on the selected POD.

Enable Qualys to ServiceNow Sync and **Enable ServiceNow to Qualys Sync** - Select these options to allow uninterrupted sync between Qualys and ServiceNow.

Active - Select this option to tell us the source is active and assets should be synced from the active source. In case of multiple sources, you can use this option to activate or deactivate a source.

Click **Submit** to create the API source.

Then, after configuring and saving the API source, choose the record you just created from the API source list, open the record and click **Test Connection**.

Create Schedules

You need to set up at least one schedule. You may eventually want many more. Once a schedule is successfully created, the sync between the source and CMDB gets working as per the defined schedule.

Qualys to ServiceNow Scheduling

Go to Qualys Asset Inventory CMDB Sync App > Schedules and select “Qualys to ServiceNow” for Sync Direction.

Enter required details to configure the schedule:

Name - Provide a unique name for your schedule that helps you identify your schedule.

Active - Select to enable and activate the schedule you create. If you want to activate a schedule sometime later, you can disable this checkbox.

API Source - Select the API Source.

Sync Direction - Select Qualys to ServiceNow.

Target Transform Map - Select the custom transform map that tells us which destination table to put the assets in. Support of Configuration Item (CI) Class Selection allows you to define/customize the destination tables into which the pulled asset information should go after the assets are approved. [Learn more](#)

Download Assets Since: Define the date and time to sync assets from Qualys to ServiceNow. The schedules will download the assets after the defined time.

API Filter: Use search tokens to filter the assets as per the requirement.

Example: `operatingSystem.category1: 'Linux'`

This token will list all the assets with the Linux operating system.

[Click here](#) for help on using the search tokens.

Run, Starting, Repeat Interval - Tell us the frequency of the schedule to be executed. For example, you could schedule it periodically every 15 minutes.

Auto Approve - Select this to enable auto-approval of assets. This will save the effort of manually approving the assets to be staged on the production tables.

Qualys to ServiceNow Sync - Select the information we should fetch for each asset: Sync Ports Info, Sync Volumes Info, Sync Network Interfaces Info, Sync Software Info.

For initial sync from Qualys to ServiceNow, we recommend that you plan your schedules at an interval of every ten minutes.

Once you configure your selections, click Submit to create the schedule.

Note: The Meta Info fields and few other blank fields such as Last Run Timestamp, Last Fetched Host Id are populated with information only after the schedule is executed.

ServiceNow to Qualys Scheduling

Go to Qualys Asset Inventory CMDB Sync App > Schedules and select “ServiceNow to Qualys” for Sync Direction.

< Schedules

To sync from ServiceNow to Qualys, you need Qualys account with Manager role.

Selection of either of Asset Group or Asset Tag is allowed. Clear current selection to choose Asset Tag.

Name: Demo Schedule

Run: Daily

Active: ☒

Time: Hours 00 00 00

* API Source: Demo Source

* Sync Direction: ServiceNow to Qualys

Last Run Timestamp

ServiceNow to Qualys Sync

* Tracking method: IP

Only NETWORK_RANGE tags are available.

Qualys Asset Tag

Please select Qualys Asset Tag or Qualys Asset Group.

Qualys Asset Group: All

Enable VM? ☒

This needs to be enabled else synced assets wont be scanned by Qualys.

Enable PC? ☐

Tick this if you want the assets to be scanned for Policy Compliance.

Table: Computer [cmdb_ci_computer]

Query: Add Filter Condition Add "OR" Clause

-- choose field -- -- oper -- -- value --

Enter required details to configure the schedule:

Name - Provide a unique name for your schedule that helps you identify your schedule.

Active - Select to enable and activate the schedule you create. If you want to activate a schedule sometime later, you can disable this option.

API Source - Select the API source.

Sync Direction - Select ServiceNow to Qualys.

Run - Tell us the frequency of the schedule to be executed. For example, we could configure to execute schedule only on-demand.

Tracking Method - Choose a tracking method when syncing from ServiceNow to Qualys. Choose IP, DNS, or NETBIOS tracking method.

Qualys Asset Tag or **Qualys Asset Group** (Optional) - Choose a Qualys Asset Tag or Qualys Asset Group. The “Qualys Asset Tag” or “Qualys Asset Group” box will assign that tag in Qualys Cloud Platform to any assets synced from ServiceNow. Note - The Asset Tags that belong to only NETWORK_RANGE type are populated. All other asset tags are ignored.

We also highly recommend you add filter conditions (at minimum IP Address) to assets to be synced. When you select a TABLE ensure that the table has a column with “ip_address” name, else the ServiceNow > Qualys sync may not function.

VM (Vulnerability Management) is enabled by default to be able to scan the assets you sync. We recommend that you do not disable this option. It is optional to enable PC (Policy Compliance).

Once you configure your selections, click Submit to create the schedule.

Note: The Meta Info fields and few other blank fields such as Last Run Timestamp are populated with information only after the schedule is executed.

Update Properties

The Asset Sync Properties have pre-populated values. However, you can always change the values to suit your needs. To view the existing properties or update the values, go to Qualys Asset Inventory CMDB Sync App > Configuration > Properties.

Let's take a look at how each property functions.

Size of Download batch - Configure two properties using this setting:

- The maximum number of assets to be fetched in a single API request call made by the scheduler.
- The maximum number of records to be fetched and processed at one go from the queue by the download processor.

Size of Upload batch - Maximum number of records to be picked by the upload processor from the queue to be uploaded to Qualys.

Max Transaction Lifetime (in minutes) - The Qualys App has time restrictions on schedule run time. Although by default the time restriction is set to 10 minutes, you can change the time restriction to any time between 10 and 60 minutes. If you configure the schedule time to 20 minutes, the schedule is stopped after 20 minutes. In such a case, next scheduled run will resume from where the earlier run was stopped.

API Timeout Setting (in milliseconds) - The wait time (in milliseconds) for the response to the API request.

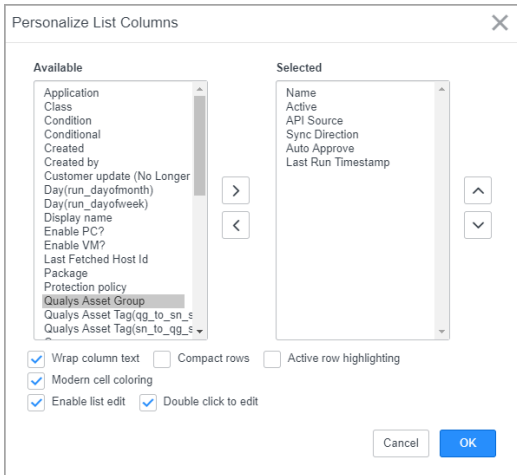
How to add data in CMDB - Choose a method to insert the data in CMDB:

- Transform Maps. Allows you to use single or multiple attributes but only single condition to define which assets to add/update to the CI records. [Learn more](#)
- Identification Engine. Allows you to use single or multiple attributes along with multiple conditions to define which assets to add/update to the CI records. [Learn more](#)

Customize Data List Columns

We display few columns in the data lists. You can customize which columns appear and change the column sequence. We'll show you an example for adding the column "Qualys Asset Group" to data lists.

1) Click the  icon in the main pane. The Personalize List Columns pop-up appears.



2) The Available list includes columns that are currently hidden. From this list, select the column you want to display. For example, double-click the column "Qualys Asset Group" and you'll see it moved to the Selected list.

3) Enable or disable other settings like Wrap column text, double click to edit, and so on.

4) Click OK.

You'll start seeing the Qualys Asset Group column. We display values in this column when the tag is present in the XML. If for some interfaces, the Qualys Asset Group is not available (XML does not contain it OR it's empty), the value in the column will be empty.

Schedules New Go to Name Search 1 to 2 of 2							
	Name	Active	API Source	Sync Direction	Auto Approve	Last Run Timestamp	Qualys Asset Group
☐	Demo Schedule - SN-QS	true	Demo Source - SN-QS	ServiceNow to Qualys	false	2019-06-05 03:01:56	(empty)
☐	Demo Schedule	false	Demo Source	Qualys to ServiceNow	false	2019-06-05 02:54:48	(empty)

Syncing

Start syncing your asset information between Qualys and ServiceNow CMDB.

In Summary

Sync Queue: This is where you'll see all jobs involved during the flow of assets between Qualys and ServiceNow.

Approve Qualys Assets: This is where you'll see assets that need manual approval when auto-approval is not enabled.

Failed Qualys Assets: This is where you'll see assets that failed to get transformed.

Sync Queue

The Sync Queue lists jobs of two types: Upload and Download. The Type column indicates the direction of the flow of assets.

Download: Qualys to ServiceNow

This shows the list of jobs run from Qualys to ServiceNow assets. The status indicates whether the application was able to parse the XML response successfully. The XML that was transferred is also available here (usually attached as response.xml).

Sync Queues New Go to: API Payload Search 1 to 3 of 3							
All API Payload Request time Response time API URL Processing Finish Type Processing Notes/Mess							
Search Search Search Search Search Search Search							
☐	[{"lastSeenAssetId":"36466","lastModifiedDate":"1999-01-01T00:00Z","pageSize":"10"}]	2019-06-17 23:13:20	2019-06-17 23:13:25	https://apigateway-p04.int.qualys.com/am...	2019-06-17 23:13:58	Download	API response attached successfully; Resp...
☐	[{"lastSeenAssetId":"","lastModifiedDate":"1999-01-01T00:00Z","pageSize":"10"}]	2019-06-17 23:14:20	2019-06-17 23:14:25	https://apigateway-p04.int.qualys.com/am...	2019-06-17 23:14:58	Download	API response attached successfully; Resp...
Actions on selected rows... 1 to 3 of 3							

Upload: ServiceNow to Qualys

This is the list of assets to be synced from ServiceNow to Qualys Cloud Platform. Defining IP along with Asset Tag or Asset Group in Schedules will add two entries for an asset during upload: one for IP address and one for Asset Tag or Asset Group.

Sync Queues New Go to: Created Search 1 to 2 of 2					
All > Type in Upload API URL Status Request time Response time Type					
Search Search Search Search upload					
☐	https://qualysapi-p04.int.qualys.com/qps/rest/2.0/update/am/tag	Success	2019-06-05 03:04:07	2019-06-05 03:04:08	Upload
☐	https://qualysapi-p04.int.qualys.com/api/2.0/fo/asset/ip/?action=add&ips=10.0.0.12&enable_vm=1&enable_pc=0&tracking_method=IP	Success	2019-06-05 03:04:14	2019-06-05 03:04:19	Upload
Actions on selected rows... 1 to 2 of 2					

Approve Qualys Assets

Assets imported from Qualys to ServiceNow will appear here for approval after successful processing in Sync Queue. If processing fails for any record in Sync Queue (status = Error), none of the host assets in that XML will be visible here. You'll need to approve each asset individually or one screen at a time. You will overwrite data in your CMDB when you approve the asset.

Qualys Assets

Approve

New

Go to

Name

Search

1

to 6 of 6

All > CMDB table sys id is empty > Status = Not Approved > Qualys Asset Id is not empty > Transform State = (empty)

Search

Search

Search

Search

=NotAppr

Search

Search

catcentos73s_QA_REN

9211558

0699c96e-b08a-4b57-a874-575f13f0565e

Not Approved

[Demo Source](#)

2020-12-30 16:00:00

catdebian84x64_RE

9243905

200e089c-9f72-4f72-b629-8da73bcd2b43

Not Approved

[Demo Source](#)

2018-06-05 17:00:00

catfedora25x64_2ND_RENAMED

9242101

41e20b85-5cf9-4c0a-a9b7-cc499a711366

Not Approved

[Demo Source](#)

2017-12-11 16:00:00

catrhel72s_QA_RE

9211557

2c928109-aa2f-413a-8041-7daa7aa24e74

Not Approved

[Demo Source](#)

2019-12-30 16:00:00

catubu1604x64_RENAMED

9242100

ac36a17-2eef-4c89-8a5d-fb7fd4499132

Not Approved

[Demo Source](#)

2021-04-29 17:00:00

CATW10PRO1511-WINDOWS-10_QA_RE

9242099

8a27a32c-a8c6-4a16-b0a5-3f98ea9aead5

Not Approved

[Demo Source](#)

2017-10-09 17:00:00

Approve

Actions on selected rows ...

1

to 6 of 6

Save time by using auto-approval

Enabling auto-approval of assets saves you effort and time because you won't have to manually approve each asset. If you enable auto-approval, none of the assets are displayed in the Approve Qualys Assets list.

Failed Qualys Assets

All of the assets imported from Qualys to ServiceNow that fail to get transformed are listed in the Failed Qualys Assets list. The transformation from Qualys to ServiceNow could fail due to criteria not being matched. For example, if you define the method to add data as "Identification Engine" and there is no identifier in the app.

All > Transform State = Fail > CMDB table sys id is empty							
Name	Transform State	Status	CPU Count	Qualys Asset Id	Asset Last Logged On User	Asset Most Frequent User	Asset UUID
Search	=FAIL	Search	Search	Search	Search	Search	Search
☐ dlkro00910	Fail	Not Approved	1	131711207	root		c7bf60b8-e80e-423c-abc2-277ccefb9e0
☐ dlkro00930	Fail	Not Approved	1	131711206	administrator		4cf2098e-31d1-4002-b3db-db8de20b8f5a

Advanced Configuration

The Advanced Configuration tells you about various pre-defined configurations and steps to customize them to your need. Transform Maps and Identification Engine are methods you can use to add data to your CMDB.

In Summary

[App Scheduled Jobs](#) - List of all scheduled jobs. Update or change the frequency of scheduled jobs as per your needs.

[Transform Maps](#) - Use transform mapping to map source and destination fields dynamically. Use predefined Transform Maps or create your own.

[Identification Engine](#) - Use this method to define the criteria using single or multiple attributes that uniquely identify the source assets and asset information before the assets get approved and are added to the CMDB system.

[Configuration Item \(CI\) Class Selection](#) - Use CI Class Selection to create customized tables and associate custom tables with custom Transform Maps.

[Application Log](#) - All log entries related to the important activities in Qualys App.

App Scheduled Jobs

All of the App Scheduled Jobs are listed under Advanced > App Scheduled Jobs.

Scheduled Jobs New Go to Name Search 1 to 10 of 10										
All > Application = Qualys ITAM App > Class = Scheduled Script Execution										
	Name	Name	Active	Active	Class	Condition	Updated	Conditional	Day(run_dayofweek)	Repeat Interval
	Search	Search	Search	Search	=sysaut	Search	Search	Search	Search	Search
☐	Auto Approval Processor	Auto Approval Processor	true	true	Scheduled Script Execution		2019-06-10 04:10:23	false	Monday	2 Minutes
☐	Auto Approval Processor2	Auto Approval Processor2	true	true	Scheduled Script Execution		2019-06-10 05:57:56	false	Monday	2 Minutes
☐	Download Processor	Download Processor	true	true	Scheduled Script Execution		2019-05-13 21:17:18	false	Monday	5 Seconds
☐	Download Processor 2	Download Processor 2	true	true	Scheduled Script Execution		2019-06-10 03:02:53	false	Monday	5 Seconds
☐	Download Processor 3	Download Processor 3	true	true	Scheduled Script Execution		2019-06-10 03:05:02	false	Monday	5 Seconds
☐	Fetch Qualys Asset Groups Schedule	Fetch Qualys Asset Groups Schedule	true	true	Scheduled Script Execution		2019-01-06 21:47:37	false	Monday	
☐	Fetch Qualys Asset Tags Schedule	Fetch Qualys Asset Tags Schedule	true	true	Scheduled Script Execution		2019-01-06 21:47:19	false	Monday	
☐	Qualys Sync Queue Cleanup Job	Qualys Sync Queue Cleanup Job	true	true	Scheduled Script Execution		2019-06-17 00:04:25	false	Monday	
☐	Qualys Terminate Schedule Logs	Qualys Terminate Schedule Logs	true	true	Scheduled Script Execution		2019-06-16 22:29:27	false	Monday	4 Hours

We support the following App Scheduled Jobs. The function and frequency of execution of each job is described. However, you can always update or change the frequency of scheduled jobs as per your needs.

Auto Approval Processor - Checks the records to know which schedule does it belong to and processes it further. Only records that have auto-approval enabled are processed by the Auto Approval Processor.

Download Processor - Picks the records of type Download with Queued status from sync queue and parses the XML. The number of records to be picked in a batch is defined by the Size of Download batch setting in Properties section. Currently, we support three download processors that work in parallel to fasten the process.

Fetch Qualys Asset Groups Schedule - By default, this schedule is executed once daily. Once executed, it syncs all of the Asset Groups in Qualys Cloud Platform for use within the App. You may run this more than once a day if you generate Asset Groups in Qualys Cloud Platform frequently.

Fetch Qualys Asset Tags Schedule - By default, this schedule is executed once daily. Once executed, it syncs all of the Asset Tags in Qualys Cloud Platform for use within the App. You may run this more than once a day if you generate Asset Tags in Qualys Cloud Platform frequently.

Qualys Sync Queue Cleanup Job - Clears the Sync Queue records with 'SUCCESS' status (older than 30 days) and records with 'ERROR' status (older than 60 days) on daily schedule.

Qualys Terminate Schedule Logs - Maintains a log of the transactions that are terminated due to exceeding the time required to execute the transaction.

Uploader - Picks the records of type Upload with Queued status from Sync Queue and sends it to Qualys.

Transform Maps

A transform map is a set of field maps that determine the relationships between fields in an import set and fields in an existing ServiceNow table.

After creating a transform map, you can reuse it to map data from another import set to the same ServiceNow table. The Transform Maps module allows an administrator to define destinations for imported data on any ServiceNow table. Transform mapping can be as simple as a drag and drop operation to specify linking between source fields on an import set table and destination fields on any ServiceNow table.

Table Transform Maps New Go to Order Search							
All > Application = Qualys Asset Inventory CMDB Sync							
	Name	Source table	Target table	Run business rules	Order	Active	Updated
	Search	Search	Search	Search	Search	Search	Search
☐	Qualys Asset Inventory Asset Transform Map	Import Assets [x_qual5_itam_app_import_assets]	Computer Extended [x_qual5_itam_app_computers_extended]	false	100	true	2019-06-23 23:38:57
☐	Qualys Asset Inventory Software Instance Map	Import Software Instance [x_qual5_itam_app_import_software_instance]	Software Instance [cmdb_software_instance]	false	100	true	2019-06-23 23:39:32
☐	Qualys Asset Inventory Network Interfaces Transform Map	Import Network Interfaces [x_qual5_itam_app_import_network_interfaces]	Network Adapter [cmdb_ci_network_adapter]	false	100	true	2019-06-23 23:39:10
☐	Qualys Asset Inventory Software Transform Map	Import Master Software [x_qual5_itam_app_import_master_software]	Software Extended [x_qual5_itam_app_software_extended]	false	100	true	2019-06-23 23:39:42
☐	Qualys Asset Inventory Open Ports Transform Map	Import Open Ports [x_qual5_itam_app_import_open_ports]	Asset Open ports [x_qual5_itam_app_open_ports]	false	100	true	2019-06-23 23:39:21
☐	Qualys Asset Inventory Volumes Transform Map	Import Volumes [x_qual5_itam_app_import_volumes]	File System [cmdb_ci_file_system]	false	100	true	2019-06-23 23:39:54
☐ Actions on selected rows... 1 to 6 of 6							

Use transform mapping to map source and destination fields dynamically. You could easily use the predefined Transform Maps or create one to suit your need.

Qualys Pre-defined Transform Map	Type of Asset Information Affected
Qualys Asset Inventory Transform Map	Assets
Qualys Asset Inventory Software Instance Map	Software Instances
Qualys Asset Inventory Network Interfaces Transform Map	Network Interfaces
Qualys Asset Inventory Software Transform Map	Software
Qualys Asset Inventory Open Ports Transform Map	Open Ports
Qualys Asset Inventory Volumes Transform Map	Volume of the Asset

Learn more

Please refer to the [ServiceNow documentation](#) to learn more about transform maps.

Identification Engine

You could opt to use Identification Engine instead of Transform Maps. Similar to transform maps, the identification engine helps you to decide which assets should be added to CMDB system. You can to define the criteria using single or multiple attributes that uniquely identify the source assets and asset information before the assets get approved and are added to the CMDB system.

Pre-requisites

- Identification Engine uses the “Configuration Management for Scoped Apps” plugin which must be installed before you start using it. Please refer to the [ServiceNow documentation](#) for detailed installation steps.
- Ensure that you add Qualys as Choices in the Discovery Source (column) of the Configuration Item (cmdb_ci table). Go to System Definition > Tables and search for Configuration Item table. In the table, open the Discovery Source column. Click New under Choices section and add Qualys as Label and Qualys as Value and click Submit.

Add or Update Rules (Pre-defined Table)

- 1) Navigate to Identification/Reconciliation > CI Identifiers.
- 2) Search for Computer Extended Table and open the record.

	Name	Active	Applies to	Description	Independent
☐	Computer Extended	true	Computer Extended [x_qual5_item_app_computers_extended]		true
☐	Configuration File	true	Configuration file [cmdb_ci_config_file]		false
☐	Connect-It Service	true	Connect-It Service [cmdb_ci_appl_connectit]	SW.Connect-It Service	false

3) Let's add a new Identifier Entry in the table. Click New.

4) Unlock the Criterion attributes to view the list of available attributes. Let us choose IP address from the Available section and click to move it to Selected section.

You could choose multiple attributes as well. In case of multiple attributes, AND condition is applicable for attributes. For example, IP Address and MAC Address.

5) Assign a priority to the attribute.

6) Select Allow null attribute to indicate if the assets with attribute value as null should be picked or not.

7) Click Submit.

Custom Table

If you are using a new custom table, then along with above mentioned steps, you also need to do the following:

Note: The following steps along with the script works only if you have selected Identification Engine for Add data in CMDB property. If you have opted for Transform Map, refer to the script in Transform Maps section.

Create custom Transform Map

1) Navigate to Qualys Asset Inventory CMDB Sync App > Transform Map and click New. Change the scope to Qualys App.

2) Provide a name for your transform map.

- 3) Select Source table and select Target table.
- 4) Click Submit and then open the newly created Transform Map.
- 5) Click New Field Map.
- 6) Ensure that you select source field and target field and click Submit.
- 7) Click New Transform script.
- 8) Choose OnBefore for When field and paste the following script:

```
(function runTransformScript(source, map, log, target /*undefined
onStart*/ ) {

if (source.target_table_name != "x_qual5_itam_app_computers_extended"){
    ignore = true; return;
}
var obj = new x_qual5_itam_app.ApproveAssets();
var transferDataType =
gs.getProperty('x_qual5_itam_app.tranform_data_type');
try{
    if(transferDataType != "Transform map"){
        ignore = true;
        var payload = obj.generatePayload(map,source);
        var jsonUntil = new global.JSON();
        var input = jsonUntil.encode(payload);
        var output =
sn_cmdb.IdentificationEngine.createOrUpdateCI('Qualys', input);
        obj.processQualysAsset(source,output);// Update
Qualys Asset Table.
    }else{
        ignore = false;
    }
}catch(e){
    log.error("Error while transforming
Asset("+source.qualys_asset_id+"). Error -"+e);
}
})(source, map, log, target);
```

Where x_qual5_itam_app_computers_extended is the name of the target table. The script ensures that if the name of the target table matches, only then the asset data is inserted in the specified target table. Else, the data is ignored. This way, you can create destination table depending on your need and insert the required data in it.

Where x_qual5_itam_app.tranform_data_type: the settings in properties that indicates the data transfer is through transform map or identification engine.

- 9) Click Submit. You can now change the scope of the app back to Global.

Configuration Item (CI) Class Selection

Define/customize the destination tables into which the pulled asset information should go after the assets are approved.

Easily create customized tables and associate custom tables with custom transform map. You can create separate transform map for each different destination table and then create a schedule for each transform map.

Let us consider an example where a company has a total of 100 assets. Among the 100 assets, 70 assets belong to Windows OS and the other 30 belong to Linux OS. The Transform Maps module enables an administrator to define destinations for imported data on any ServiceNow table. Using CI Class, you can easily achieve this.

Customize Transform Maps Using CI Class

The following steps along with the script work only if you have selected “Transform Map” for the “Add data in CMDB” property. If you have opted for Identification Engine, refer to the script in the Identification Engine section.

Step 1: Create your own custom tables

- 1) Go to System Definition > Tables and click New.
- 2) Ensure that you select Configuration Item (name=cmdb_ci) table in Extends table field.
- 3) Create custom columns as per your need.
- 4) Clear the Create Module check box.
- 5) Click Submit.

Step 2: Create custom Transform Map

- 1) Go to Qualys Asset Inventory CMDB Sync App > Transform Map, and click New. Change the scope to Qualys App.
- 2) Provide a name for your transform map.
- 3) Select Source table and select Target table.
- 4) Click Submit and then open the newly create Transform Map.
- 5) Click New Field Map.
- 6) Ensure that you select source field and target field and click Submit.
- 7) Click New Transform script.
- 8) Choose OnBefore for When field and paste the following script:

```
if (source.target_table_name != "x_qual5_itam_app_computers_extended")
{
    ignore = true; return;
}
```

Where x_qual5_itam_app_computers_extended is the name of the target table. The script ensures that if the name of the target table matches, only then the asset data is inserted in the specified target table. Else, the data is ignored. This way, you can create destination table depending on your need and insert the required data in it.

9) Click Submit.

Step 3: Create custom schedule

Create a new custom schedule and ensure that you associate the customized transform map you created to Target Transform Map field.

Step 4: Update report configuration

You need to configure report settings to pick data from the customized destination table you create to avoid data mismatch.

Application Log

Log entries are listed under Advanced > Application Logs.

	Level	Message	Source Script	Source Script Table	Sequence	Source
☐	Information	1.0 Download Queue Processor Download processor trying to read 10 record(s) for this run id 0b33f2a8db3a3f808d2ed92b5e961926	Script Include: QualysAppUtil	Script Include [sys_script_include]	2019-07-19 03:00:01	x_qual5_itam_app
☐	Information	1.0 Download Queue Processor Download processor trying to read 10 record(s) for this run id 85437668db72bb80bf3f58b8dc961932	Script Include: QualysAppUtil	Script Include [sys_script_include]	2019-07-19 03:00:10	x_qual5_itam_app
☐	Information	1.0 Download Queue Processor Download processor trying to read 10 record(s) for this run id c9433668db72bb80bf3f58b8dc961998	Script Include: QualysAppUtil	Script Include [sys_script_include]	2019-07-19 03:00:10	x_qual5_itam_app
☐	Information	1.0 Download Queue Processor Download processor trying to read 10 record(s) for this run id 0d433668db72bb80bf3f58b8dc9619a5	Script Include: QualysAppUtil	Script Include [sys_script_include]	2019-07-19 03:00:10	x_qual5_itam_app

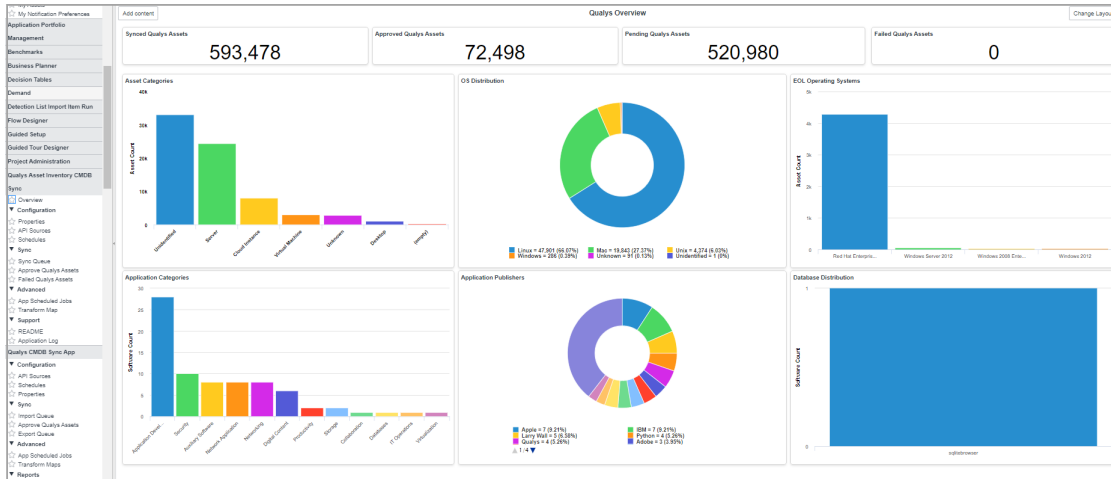
Logged activities include:

- API Response. For example, when you click Test Connection and if the account does not have access to Global IT Asset Inventory module.
- Schedule Lifecycle (Start, Run, and Finish)
- Lifecycle of Download Processor and Upload Processor (Start, Run, and Finish)
- Transform Type being used (Transform Map or Identification Engine)
- Asset Approval type (Manual or Auto Approval)
- Fetching Asset Tags and Asset Groups

View Reports

Go to Qualys Asset Inventory CMDB Sync App > Overview. The Overview page displays a consolidated view of all the reports. If you view this page before syncing the assets, it may display all values as zero.

Note: The Reports option from version 1.0 is now merged in the Overview option. Thus, you will no longer see the Reports option in the menu.



When the Overview page is launched for the first time, you see a list of 10 default reports. However, the reports can be customized based on your preference. For more information, see, [Customize Overview Page](#).

Types of reports that you can configure:

Report Name	Description
Qualys Assets Reports	
Approved Qualys Assets	The Approved Qualys Assets report lists the assets auto/manually approved. This number is listed on the production table.
Asset Categories	The Asset Categories report gives a clear picture of the various types of assets across your organization. The chart is a diagrammatic representation of the asset categories. Click the bar to view additional details about the respective asset category.
End of Life Operating Systems	The End of Life (EOL) Operating Systems report gives a clear picture of the various types of operating systems with the end of life across your organization. The chart is a diagrammatic representation of the operating systems. Click the bar to view additional details about the respective operating system.
Failed Qualys Assets	The Failed Qualys Assets lists the number of assets that are not transformed into the CMDB table.

Report Name	Description
Hardware Manufacturers	The Hardware Manufacturers report gives a clear picture of the various manufacturers of hardware across your organization. The chart is a diagrammatic representation of the hardware manufacturers. Click the slice to view additional details about the respective manufacturer.
OS Distribution	The OS Distribution report gives a clear picture of the operating systems installed on the assets across your organization. The chart is a diagrammatic representation of the operating systems. Click the slice to view additional details about the respective operative system.
Pending Qualys Assets	The Pending Qualys Assets report lists the assets which are not approved.
Synced Qualys Assets	The Synced Qualys Assets report lists the assets synced from Qualys to ServiceNow.
Software Report	
Application Categories	The Application Categories report gives a clear picture of the various types of applications installed on the assets across your organization. The chart is a diagrammatic representation of the various applications. Click the bar to view additional details about the respective application category.
Application Publishers	The Application Publishers report gives a clear picture of the various publishers of the application installed on assets across your organization. The chart is a diagrammatic representation of the publishers. Click the bar to view additional details about the respective publisher.
Database Distribution	The Database Distribution report gives a clear picture of the various types of the database used across your organization. The chart is a diagrammatic representation of the database distribution. Click the bar to view additional details about the respective database type.
End of Life Application	The End of Life (EOL) Application report gives a clear picture of the various types of applications with end of life across your organization. The chart is a diagrammatic representation of the Application. Click the bar to view additional details about the respective operating system.
Software Distribution	The Software Distribution report gives a clear picture of the various types of software used across your organization. The chart is a diagrammatic representation of the software distribution. Click the bar to view additional details about the respective database type.
Software Lifecycle Stage	The Software Lifecycle Stage report lists the lifecycle stages of applications. Example: GA, EOL/EOS.

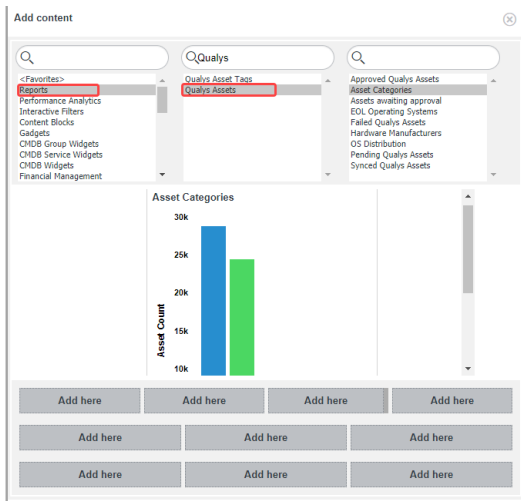
Customize Overview Page

You can add or remove the reports from the Overview page.

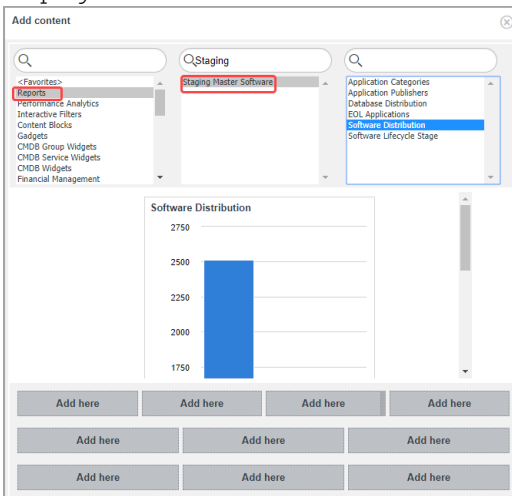
Add a Report

Click on **Add content**, the Add content pop-up appears. Select one of the following options to add reports:

-To add Qualys Assets reports: Select Reports from the first column, Qualys Assets from the second column and in the third column, select the required report from the displayed list.



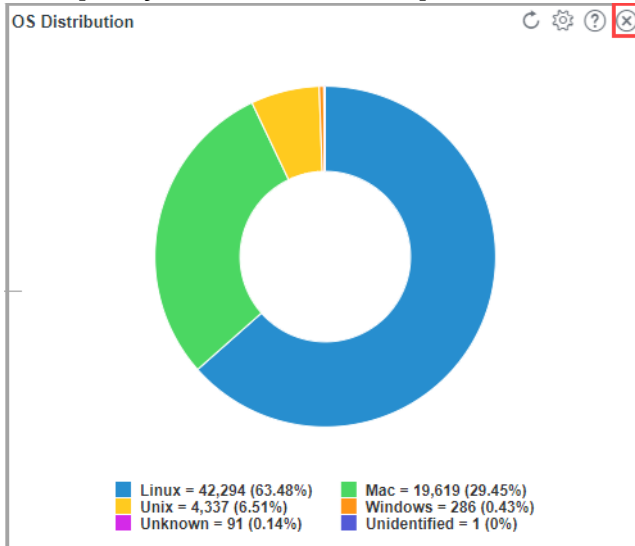
-To add Software reports: Select Reports from the first column, Staging Master Software from the second column and in the third column, select the required report from the displayed list.



Once you select the required report, click one of the **Add here** options. The 10 Add here options indicate different locations where you can add the report on the Overview page.

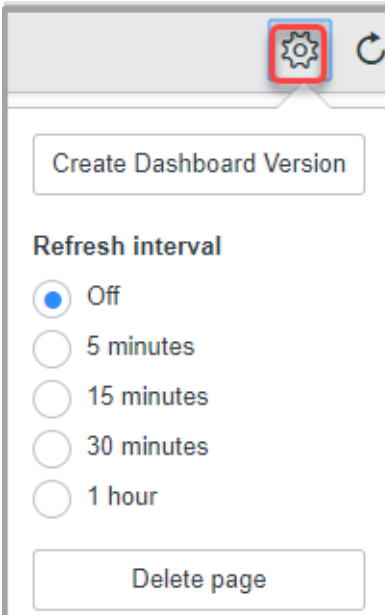
Remove a Report

To remove a report from the overview page, click on the close  option. Once you delete the report, you cannot undo the process. To add the same report again, see [Add a Report](#).



Refresh Overview page

To refresh all the reports on the Overview page at a fixed interval, click on the Homepage Settings  icon and select the required Refresh interval.



Create Dashboard Version

Refresh interval

☒ Off

☐ 5 minutes

☐ 15 minutes

☐ 30 minutes

☐ 1 hour

Delete page

Debugging and Troubleshooting

Here are scenarios that will help you debug certain common issues.

How to debug

In case of any unexpected application behavior one should check the application logs.

The application log has four different levels of logging: Information, Error, Warning, Debug

The application writes log entries after important transitions. For example, Schedule run, on click of test connection to API Server [Qualys Qualys Asset Inventory CMDB Sync App > Advanced > Application Log]

Observed Issues

Scenario: Sometimes clicking on 'Test Connection' gives 'error' response to user.

Workaround: Check the error message.

- Try to repeat the 'Test Connection' a couple more times (if all input parameters are correct then 'success' message will be displayed)
- One can get the error message under 'Schedule Logs' for related entries in schedule record
- If no valid error is displayed (i.e. you are sure that the credentials are correct but API reported "unauthorized"), try again after some time. If error persists, contact Qualys Support

Scenario: When Download processor takes too much time to process

Workaround: Go to Properties and lower the Size of Download batch.

Scenario: Download Processor failed to process Sync Queue record(s)

Workaround: This may leave the corresponding Sync Queue entry in 'Error' state and the error details can be verified from 'Processing Notes/Message'

User should manually change the status back to

- 'Queued', and reset the 'Processor GUID' if he/she wants to process that response again.

If you reprocess any response, it will not lead to duplicate data, as application checks whether the record already exists in staging tables before inserting.

- 'Error', if he/she does not want to process it again.

Scenario: Exception while approving the assets, when you have multiple CI Rules setup with the same priority

In this case, the asset fails to approve. The application log will display the following error:

Error while transforming asset(asset id). Error -java.lang.NullPointerException

Workaround: Ensure you do not have multiple CI rules with the same priority and have expected order defined.

Scenario: Failed to approve asset using Identification Engine/Invalid Update

This error is displayed when the application finds some error with Identification and Reconciliation APIs.

To verify the issue, you can navigate to Failed Qualys Assets > Open the asset record and see the Notes section. This section contains the detailed error response, as received from Identification and Reconciliation API.

Scenario: Sometimes it is observed that 'approving' manually multiple assets gives 'Transaction Timeout' by ServiceNow

Workaround:

- In such case there is no data loss observed in asset transformation
- To overcome transaction timeout error, it is recommended to use 'Auto Approval' in schedule

Anticipated Issues

- Parallel execution of two schedules for two different CI Classes may insert records in both the custom CI tables. Hence it is recommended to run each schedule independently created for each CI Class.
- It is quite frequent to have error in opening/viewing attached 'response.xml' from sync queue records. Those response.xmls are considered as incomplete.

List of expected failure modes

- Qualys API server is undergoing maintenance/downtime
- Qualys subscription expired
- User credentials used are incorrect
- User credentials are correct, but user has no Qualys App subscription from Qualys

Common Questions

Do you currently support the Identification and Reconciliation API for CMDB CRUD actions?

Yes, Qualys App supports Identification and Reconciliation APIs. The goal of this API is to maintain the integrity of the database, and to correctly identify CIs so that new records are created only if CI is truly new to CMDB. See [CMDB Identification and Reconciliation](#)

You can change how to add data in CMDB from default Transform Map to Identification Engine from Properties page. You also need to create CI Identifier Rule for Target table.

What are the Target tables and which tables being considered for comparison delta?

The records are primarily compared and updated/created on x_qual5_itam_app_computers_extended table which is extended from cmdb_ci_computer table. However, if user wants to use any other table, they can easily update the transform map to work with some other table of their choice.

Can user add data to ServiceNow app from different Qualys servers?

Yes, user can add asset data from different Qualys PODs. User needs to create different API Sources and Schedules as per Qualys servers.

What are Upload and Download type records in Queue?

It can be easily differentiated by Type field available in the table. For Downloading data to ServiceNow app (i.e syncing assets from Qualys to ServiceNow) Type will be Download. For Uploading data to Qualys (Syncing assets from ServiceNow to Qualys servers) Type will be Upload.

Where can I find Assets which failed to transform in ServiceNow table?

You'll find these assets in Failed Qualys Assets. Users can then approve these assets again.

Why do I view timestamps in GMT for schedules despite configuring a different timezone?

In the schedule scripts, we use ServiceNow's new GlideDateTime().getDisplayValueInternal(); function to update the schedule last_run_timestamp. When this object is directly instantiated and used (e.g. in scoped application background script), it returns time in GMT, irrespective of the timezone configured for user under whom this script runs. That's how it is designed.

Also, since ServiceNow does not allow scoped applications to set the timezone, the app cannot do that on behalf of the user who created the schedule. However, the time value you see on the UI is shown in the user set timezone - even if you set GMT date-time in this column. When the schedule runs next time, it fetches value in GMT, and not the one you see on UI. That may lead to confusion, and log entries show time in GMT, for this reason we recommend that the ServiceNow user sets his or her time to GMT.

The Schedules I defined pulled the data accurately till yesterday. But, today, the same schedule is unable to fetch any assets or related data.

Check your application logs. The reason the schedules are unable to fetch assets is because either your trial period or your subscription has expired. Contact your TAM to extend your subscription. Once you have an active subscription, you need to activate your API Source and the schedules will fetch the assets.

If an asset is purged from Qualys, what will its status be in ServiceNow CMDB?

The asset purged from Qualys will not automatically be purged in ServiceNow CMDB. The asset must be manually purged from ServiceNow.

Field Mapping for Transform Maps

Qualys Asset Inventory Asset Transform Map

Source	Target
Import Assets (x_qual5_itam_app_import_assets)	Computer Extended (x_qual5_itam_app_computers_extended)
CPU Count(asset_cpucount)	CPU Count(asset_cpucount)
Asset Last Logged On User(asset_lastloggedonuser)	Asset Last Logged On User(asset_lastloggedonuser)
Asset Most Frequent User(asset_mostfrequentuser)	Asset Most Frequent User(asset_mostfrequentuser)
Asset UUID(asset_uuid)	Asset UUID(asset_uuid)
BIOS Asset Tag(bios_asset_tag)	BIOS Asset Tag(bios_asset_tag)
BIOS Description(bios_description)	BIOS Description(bios_description)
BIOS Serial Number(bios_serial_number)	BIOS Serial Number(bios_serial_number)
DNS Hostname(dns_hostname)	DNS Hostname(dns_hostname)
Hardware category(hardware_category)	Hardware category(hardware_category)
Hardware category 1(hardware_category_1)	Hardware category 1(hardware_category_1)
Hardware category 2(hardware_category_2)	Hardware category 2(hardware_category_2)
Hardware Full Name(hardware_full_name)	Hardware Full Name(hardware_full_name)
Hardware Lifecycle Confidence (hardware_lifecycle_confidence)	Hardware Lifecycle Confidence (hardware_lifecycle_confidence)
Hardware Lifecycle EOS Date (hardware_lifecycle_eos_date)	Hardware Lifecycle EOS Date (hardware_lifecycle_eos_date)
Hardware lifecycle GA (hardware_lifecycle_ga)	Hardware lifecycle GA (hardware_lifecycle_ga)
Hardware lifecycle GA (hardware_lifecycle_ga)	Hardware lifecycle GA (hardware_lifecycle_ga)
Hardware Lifecycle Intro Date (hardware_lifecycle_intro_date)	Hardware Lifecycle Intro Date (hardware_lifecycle_intro_date)
Hardware Lifecycle Obsolete Date (hardware_lifecycle_obsolete_date)	Hardware Lifecycle Obsolete Date (hardware_lifecycle_obsolete_date)
Hardware lifecycle Stage (hardware_lifecycle_stage)	Hardware lifecycle Stage (hardware_lifecycle_stage)
Hardware Product (hardware_product)	Hardware Product (hardware_product)
Hardware Serial Number (hardware_serial_number)	Hardware Serial Number (hardware_serial_number)
IP Address (ip_address)	IP Address (ip_address)
Last boot (last_boot)	Last boot (last_boot)
Last Modified Date (last_modified_date)	Last Modified Date (last_modified_date)

Hardware Manufacturer (manufacturer)	Hardware Manufacturer (hardware_manufacturer)
Memory (memory)	Memory (memory)
Hardware Model (model)	Hardware Model (model)
Name (name)	Name (name)
NetBIOS name (netbios_name)	NetBIOS name (netbios_name)
Os Architecture (os_architecture)	Os Architecture (os_architecture)
Os Category (os_category)	Os Category (os_category)
Os Category 1 (os_category_1)	Os Category 1 (os_category_1)
Os Category 2 (os_category_2)	Os Category 2 (os_category_2)
Os Category Type (os_category_type)	Os Category Type (os_category_type)
Os Edition (os_edition)	Os Edition (os_edition)
Os Full Name (os_full_name)	Os Full Name (os_full_name)
Os Lifecycle Confidence (os_lifecycle_confidence)	Os Lifecycle Confidence (os_lifecycle_confidence)
Os Lifecycle EOL Date (os_lifecycle_eol_date)	Os Lifecycle EOL Date (os_lifecycle_eol_date)
Os Lifecycle EOL Support Stage (os_lifecycle_eol_support_stage)	Os Lifecycle EOL Support Stage (os_lifecycle_eol_support_stage)
Os Lifecycle EOS Date (os_lifecycle_eos_date)	Os Lifecycle EOS Date (os_lifecycle_eos_date)
Os Lifecycle EOS Support Stage (os_lifecycle_eos_support_stage)	Os Lifecycle EOS Support Stage (os_lifecycle_eos_support_stage)
Os lifecycle ga (os_lifecycle_ga)	Os lifecycle ga (os_lifecycle_ga)
Os Lifecycle Stage (os_lifecycle_stage)	Os Lifecycle Stage (os_lifecycle_stage)
Os Market Version (os_market_version)	Os Market Version (os_market_version)
Os Name (os_name)	Os Name (os_name)
OS Product Name (os_product_name)	OS Product Name (os_product_name)
Os Publisher (os_publisher)	Os Publisher (os_publisher)
Os update (os_update)	Os update (os_update)
Os Version (os_version)	Os Version (os_version)
Processor CPU Counts (processor_cpu_counts)	Processor CPU Counts (processor_cpu_counts)
Processor Description (processor_description)	Processor Description (processor_description)
Processor speed (processor_speed)	Processor speed(processor_speed)
(qualys_asset_id)	Qualys Asset Id(qualys_asset_id)
QWEB Host Id(qweb_host_id)	QWEB Host Id(qweb_host_id)
Time Zone(timezone)	Time Zone(timezone)
Type(type)	Type(type)

2. Qualys Asset Inventory Network Interfaces Transform Map

Source	Target
Import Network Interfaces(x_qual5_itam_app_import_network_interfaces)	Network Adapter (cmdb_ci_network_adapter)
Address (address)	IP Address (ip_address)
Hostname (hostname)	Fully qualified domain name (fqdn)
Interface Name (interface_name)	Name (name)
MAC Address (mac_address)	MAC Address (mac_address)
Type (type)	Category (category)
CMDB table sys id (cmdb_table_sys_id)	Configuration Item (cmdb_ci)

3. Qualys Asset Inventory Open Ports Transform Map

Source	Target
Import Open Ports (x_qual5_itam_app_import_open_ports)	Asset Open ports (x_qual5_itam_app_open_ports)
Description (description)	Description (description)
Detected Service (detected_service)	Detected Service (detected_service)
Port (port)	Port (port)
Protocol (protocol)	Protocol(protocol)
CMDB table sys id (cmdb_table_sys_id)	CI Sys Id (ci_sys_id)

4. Qualys Asset Inventory Volumes Transform Map

Source	Target
Import Volumes (x_qual5_itam_app_import_volumes)	File System (cmdb_ci_file_system)
Name (name)	Name (name)
Free size (free_size)	Free space bytes (free_space_bytes)
Total Size (total_size)	Size bytes (size_bytes)
CMDB table sys id (cmdb_table_sys_id)	Provided by (provided_by)

5. Qualys Asset Inventory Software Transform Map (Master Software)

Source	Target
Import Volumes (x_qual5_itam_app_import_volumes)	Software Extended (x_qual5_itam_app_software_extended)
Architecture (architecture)	Architecture (architecture)
Category (category)	Qualys Software Category (qualys_software_category)
Category 1 (category_1)	Category 1 (category_1)

Category 2 (category_2)	Category 2 (category_2)
Category Type (category_type)	Category Type (category_type)
Component (component)	Component (component)
Edition (edition)	Edition (edition)
Is Ignored (is_ignored)	Is Ignored (is_ignored)
Is Ignored Reason (is_ignored_reason)	Is Ignored Reason (is_ignored_reason)
Language (language)	Language(language)
License Category (license_category)	License Category (license_category)
Lifecycle GA (lifecycle_ga)	Lifecycle GA (lifecycle_ga)
Lifecycle Stage (lifecycle_stage)	Lifecycle Stage (lifecycle_stage)
Market Version (market_version)	Market Version (market_version)
Name (name)	Name (name)
Product (product)	Product (product)
Publisher(publisher)	Publisher (publisher)
Lifecycle Confidence (software_lifecycle_confidence)	Lifecycle Confidence (software_lifecycle_confidence)
Software Lifecycle EOL Date (software_lifecycle_eol_date)	Lifecycle EOL Date (software_lifecycle_eol_date)
Software Lifecycle EOL Support Stage(software_lifecycle_eol_support_stage)	Lifecycle EOL Support Stage (software_lifecycle_eol_support_stage)
Software Lifecycle EOS Date (software_lifecycle_eos_date)	Lifecycle EOS Date (software_lifecycle_eos_date)
Software Lifecycle EOS Support Stage (software_lifecycle_eos_support_stage)	Lifecycle EOS Support Stage (software_lifecycle_eos_support_stage)
Type (type)	Type (type)
Update (update)	Update (update)
Version (version)	Version (version)

6. Qualys Asset Inventory Software Instance Transform Map (Mapping Software) -

Source	Target
Import Software Instance (x_qual5_itam_app_import_software_instance)	Software Instance (cmdb_software_instance)
Install Date (install_date)	Install date (install_date)
CMDB software sys id (cmdb_software_sys_id)	Product Name (software)
CMDB table sys id (cmdb_table_sys_id)	Installed on (installed_on)