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About this guide

Welcome to Qualys App for Splunk Enterprise with TA! This user guide describes how to install and use the Qualys Technology Add-on (TA) to see your Qualys data in Splunk.

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/

Want to contact Support

Send an email to support@qualys.com with the following information:

- Qualys TA version
- Visualization App version related to the issue, if any
- Complete TA and Splunk log for the time duration you had the issue
Get Started

Qualys App for Splunk Enterprise pulls (via the TA-QualysCloudPlatform) vulnerability and compliance detection data from your Qualys account and puts it in Splunk for easier searching and reporting.

The app uses Splunk’s App Development framework and leverages existing Qualys APIs.

Pre-requisites

- A valid Qualys account with API access
- A Splunk Enterprise/Cloud account
- Computer with Linux

Download and Install the App

Download the latest version of Qualys Technology Add-on (TA) for Splunk by going to:
https://splunkbase.splunk.com/app/2964/
Upload the downloaded tar.gz file using the “Install app from file” option.

Browse to the file and click Upload.

You’ll be prompted to restart Splunk. When you log back in, click the “Set up now” button.
Configure the App

Provide details for connecting to the Qualys API Server. Then configure settings for collecting VM, WAS, PC, FIM, EDR, CS detection data, Activity log, and KB Data. To access this page, go to Apps > Manage Apps > Qualys Technology Add-on for Splunk > Set up.

Note

If you are installing TA for the first time or upgrading your TA that has no configuration, then you must restart your Splunk once configurations in TA are saved successfully. You are required to restart Splunk only when you configure TA the first time. Restarting Splunk enables TA to reload the configurations from the app.conf file, which are modified after TA configuration.

If you are upgrading to TA 1.8.9, you have to again manually enter Qualys API credentials after the upgrade otherwise you wont be able to access the Qualys API server. Before entering the credentials, we recommend you to empty the cache of your browser and do a hard reload.
Which URL do I enter for the Qualys API Server?
You’ll enter the Qualys API Server URL for the Qualys Cloud Platform where your account is located. Click here if you need help finding the URL.

Which account credentials do I provide?
The username and password for the Qualys account you want to sync with Splunk. Note – If you return to TA Setup page at a later time, your saved credentials won’t be visible. Do not enter credentials again as this will add another credential pair to the passwords.conf file and may cause issues when trying to pull data.

Note - If your TA version is 1.8.7 or higher, you do not have to remove the passwords.conf file to update TA credentials. Just update the credentials from the TA setup page without removing the passwords.conf file.
Can I authenticate using a client certificate?
Yes. Select “Use a Client certificate for authentication” and provide your PEM-encoded X.509 certificate (.pem file). You’ll also need to provide the certificate key (.key file) if it’s separate from the certificate, and enter a passphrase if the certificate/key file is encrypted.

Can I configure multiple Qualys instances via one Qualys TA App?
You can not create multiple Qualys instances using one Qualys TA app instance running on a Splunk instance. A single TA app instance does not support configuring multiple Qualys user accounts. The solution is to create multiple TA instance across multiple forwarders and configure one user account on each TA instance.

VM Detection Data
Configure settings for collecting VM detection data. Select one or more logging options to indicate the type of data you want to view in Splunk.

Enter API input parameters (in the Extra parameters field) for the Host Detection API to pull select vulnerability data from your Qualys account.

For example, only pull data for certain hosts by specifying ips=10.10.10.2-10.10.10.10.
Refer to API user guides
Why choose “Log host information with each detection”?
Choose this option if you want to log host information (IP, OS, DNS, NetBios) along with each detection.

Tell me about the “Host fields to log” and “Detection fields to log” fields
1) In the “Host fields to log” field, we show the default output fields that you will see for host assets on Splunk for VM events. You can add additional comma-separated host XML tag names such as “Asset_ID” returned in the Host List API response that you want to log in the event or remove any existing tag that you don’t want to log.

2) In the “Detection fields to log” field, we show the default output fields that you will see for host detection on Splunk for VM events. You can add additional comma-separated detection XML tag names such as “AFFECT_EXPLOITABLE_CONFIG” and “AFFECT_RUNNING_KERNEL” returned in the Host List Detection response that you want to log in the event or remove any existing tag that you don’t want to log.

Tell me about the “Max characters allowed in RESULTS” field
The “Max characters allowed in RESULTS” field lets you specify how many maximum characters will appear in the Results field. This means if the number of characters exceeds the maximum allowed characters, then TA will truncate the excess characters after parsing the RESULTS field and append the message “[TRUNCATED XXX Characters]” in the Results field. The max length includes the characters in the appended message. The default value is zero which means TA won't truncate any characters while parsing and you will see the entire value in the RESULTS field in Splunk.

What values are shown in the “RESULT_TRUNCATED” field?
The “RESULT_TRUNCATED” field shows values based on whether the RESULT field is truncated by TA or Splunk.

1) The “RESULT_TRUNCATED” field is set to “0” if neither TA nor Splunk truncates the value in the Results field.

2) The “RESULT_TRUNCATED” field is set to “1” when Splunk truncates the RESULTS field. This happens if the truncation value set for the RESULTS field in the props.conf file in Splunk is greater than that set on the TA set up page. In this case, the difference between the truncation values set in the TA and Splunk is truncated by Splunk after TA truncates the RESULTS field as per the value specified in the “Max characters allowed in RESULTS” field.

3) The “RESULT_TRUNCATED” field is set to “2” if TA, after parsing the event, truncates the RESULTS field value and if the truncation value set for the RESULTS field in the props.conf file in Splunk is either the same or less than that set for the RESULTS field for VM on the TA set up page.

Note that if Splunk truncates the RESULTS field, then the message “[TRUNCATED XXX Characters]” in the Results field is not shown.
What are VM Detection-Advanced Settings?
The "Enable full data pull always?" option allows you to specify whether TA should do a full data pull or an incremental pull on each run. By default, this is not selected and TA does an incremental pull. Select the option to pull the full host detection data from Qualys account and put it on Splunk.

The "Enable .seed file generation?" option indicates to TA to generate a .seed file at the location specified by you for TA to stream host detection data into Splunk. You have the option to specify either directory path or file path. If you specify a directory path, TA creates a seed file each time TA pulls data into Splunk. TA appends data in the same .seed file if you specify a file.

We strongly recommend you to get in touch with our support team if you want to change VM Detection-Advanced Settings.

How to configure directory path for the .seed file on Splunk Cloud?
Directory path for the .seed file on Splunk Cloud must start with $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/tmp. TA-QualysCloudPlatform shows an error while generating the .seed file if you configure any other path.

What are the event types for searching VM Detection data in Splunk?
Note that we provide default event types that you can use to search for VM detection data pulled in Splunk. See Event Types for Searching your Apps Data.

Policy Compliance Data
Choose one or more options to specify what posture data you want to fetch and index in Splunk for your policy. 1) Select "Log individual PC Compliance Posture events" to fetch posture info for all the host assets. 2) Select "Log Policy Summary", to fetch policy summary information. These two options are selected by default. 3) Select "Log "All" details" to fetch full posture data. If the check box is not selected, we will show only basic details for your policy. 4) Select the “Add additional fields (REMEDIATION, RATIONALE, EVIDENCE, CAUSE_OF_FAILURE)” check box, to fetch and index full posture data and also data for these additional fields.

We use “policy_id” parameter to pull posture information. TA will first fetch all the policy IDs using the Compliance Policy List API and then for each policy_id, it fetches the posture information using the Compliance Posture Information API.

The “Number of posture info records per API request” option lets you specify the number of posture info records that will be returned per request for a single policy. The value in this field will be used for the “truncation_limit” parameter of the PC posture API request. If the requested list identifies more records than the truncation limit, then the XML output includes the <WARNING> element and the URL for making another request for the next batch of records.

The default value is 1000. If you specify 0, then TA will fetch all the posture information for a policy ID in a single output. We recommend paginated output if the posture info data is large.
Enter API input parameters (in the Extra parameters field) for the Posture Information API. For example, specify IDs of the hosts for which you want to collect the compliance posture information. Refer to API user guides.

Note that we provide default event types that you can use to search for policy compliance data pulled in Splunk. See Event Types for Searching your Apps Data.

**WAS Findings**

Configure WAS Finding settings data to collect WAS data from your Qualys WAS account. You can choose to log individual findings and/or web application summary events.

Enter API input parameters (in the Extra parameters field) for the WAS Findings API to pull select data from your Qualys account. For example, specify Ids of web applications for which you want to view data. Refer to API user guides.

Note that we provide default event types that you can use to search for WAS Findings data pulled in Splunk. See Event Types for Searching your Apps Data.
**Container Security Data Settings for Images**

Configure these settings to collect Container Security data for individual docker image vulnerabilities and summary of events for docker images.

Enter API input parameters (in the Extra parameters field) for the Docker Image Vulnerability API. This lets you pull only select vulnerability data for docker images from your Qualys account. For example, specify Ids of docker images for which you want to view vulnerability data. Go to the Container Security online help for API information.

![Container Security Settings for Images](image)

Note that we provide default event types that you can use to search for CS data for images data pulled in Splunk. See Event Types for Searching your Apps Data.

**Container Security Data Settings for Containers**

Configure these settings for collecting CS data for containers. Select one or more logging options to indicate whether you want to log and show individual vulnerabilities on a container and/or a summary of vulnerabilities found on a container. The Summary will include the total number of vulnerabilities with a break up of potential, confirmed and patchable vulnerabilities.

Enter API input parameters (in the Extra filters for Containers field) for the Container Vulnerability API. This lets you pull specific containers and their vulnerability data from your Qualys account. For example, if you want to download data only about running
containers that has severity 5 vulnerabilities, you would specify state:RUNNING and vulnerabilities.severity:5 in the Extra filters field. Go to Container Security Online Help for API information.

![Container Security Settings for Containers]

Note that we provide default event types that you can use to search for CS data for containers data pulled in Splunk. See Event Types for Searching your Apps Data.

**FIM data settings for events, ignored events and incidents**

Configure FIM Settings for Events, Ignored Events and Incidents to collect FIM data for events, ignored events and incidents from your Qualys FIM account.

Enter API input parameters (in the Extra filters for FIM Events API, Extra filters for FIM Ignored Events API, Extra filters for FIM Incidents API) to specify what data (events, ignored events and incidents) will be pulled from your Qualys account.

For example, specify “action: rename” to pull all the events that are generated for this action.

![FIM Settings for Events]
Note that FIM UI uses the user's local timezone while the Splunk-FIM integration uses UTC timezone by default. If you are trying to match results from UI to Splunk integration, you will need to match Qualys UI and Splunk Integration timezones.

**Note**

*TA versions greater than 1.6.5 only work with FIM API version 2.0.2.0 and later and not with versions earlier than 2.0.2.0.*

Note that we provide default event types that you can use to search for FIM events, ignored events, and incidents pulled in Splunk. See Event Types for Searching your Apps Data.

**Endpoint Detection and Response (EDR) Settings**

Configure EDR API settings to fetch the EDR data from your Qualys EDR Account. Enter the API input parameters (in the Extra parameters to pass to Indication of Compromise API) to specify what EDR data (events) will be pulled from your Qualys account.
TA uses default parameters “type:file AND indicator.score>0) OR (type:process AND action:running)” in the API request to call EDR API. These parameters are shown in the EDR settings. You can customize the API request by adding new parameters or modifying the existing parameters.

Activity Log Settings
Configure Activity Log settings to fetch activities from your Qualys account. Enter the API input parameters (in the Extra parameters to pass to Activity Log API) to specify what Activity Log data (events) will be pulled from your Qualys account.

KnowledgeBase Settings
Configure Knowledge Base settings to enable or disable indexing KnowledgeBase (KB) data in Splunk. The check box “Index the KnowledgeBase…”, indicates whether TA after pulling the KnowledgeBase data will index the KnowledgeBase data in Splunk or write the data into a CSV file.

When you select the check box and click Save, TA fetches the KB data and then indexes this data into Splunk. If you are on the distributed setup environment, we recommend you to select this option so that you can get the updated KnowledgeBase data on the Search Head and generate the KB CSV file from the Search Head.
If the check box is not selected, TA does not index the KB data and creates a KB CSV file. The CSV file will have KB data from 1999-01-01 till the current date. By default, this option is disabled.

After you enable the index KB data option, the KB data will be indexed in Splunk. Next, you need to generate the KB CSV lookup on the Search Head using the Splunk's scheduled saved searches feature. To generate KB CSV look up on the Search Head, you need to create a schedule save searches on the Search Head, and then create the KB CSV lookup definition. Creating “scheduled saved searches” and “KB CSV Lookup Definition” on the Search Head” are one-time activities that you need to perform when you enable KB indexing first time.

Note that we recommend these steps if you are using distributed Splunk setup & have enabled the index KB data option on the TA setup page.

If you disable the KB indexing option later, then disable the scheduled save searches and lookup definitions created for KB indexing. If you enable the KB indexing option after disabling, then just enable the scheduled save searches and lookup definitions created for KB indexing instead of creating them again.

**Create scheduled saved searches on the Search Head**

1) Go to **Settings > Searches, Reports, and Alerts**.

2) On the **Searches, Reports, and Alerts** page, click **New Report**.

3) On the **Create Report** screen, enter a title & description for the new report. For example, you can have a title: Generate KB CSV Lookup and a description: Generate KB CSV Lookup.

4) In the **Search** field, copy and paste this SPL and replace the `{INDEX_NAME}` with the actual index name which you have set for KnowledgeBase data input. The SPL will read the KB data for the specified fields using the specified index that has the Qualys KnowledgeBase source type and then write this data in the KB CSV output file.
Configure the App
Get Started

index= {INDEX_NAME} sourcetype="qualys:knowledgebase" | table QID, SEVERITY, VULN_TYPE, PATCHABLE, PCI_FLAG, TITLE, CATEGORY, PUBLISHED_DATETIME, CVSS_BASE, CVSS_TEMPORAL, CVSS_VECTOR_STRING, CVSS_V3_BASE, CVSS_V3_TEMPORAL, CVSS_V3_VECTOR_STRING, CVE, VENDOR_REFERENCE, THREAT_INTEL_IDS, THREAT_INTEL_VALUES, BUGTRAQ_IDS | outputlookup qualys_kb.csv

5) In the **App** field, select the **Search & Reporting (search)** option to generate the KB CSV file under the directory: SPLUNK_HOME/etc/apps/search/lookups/.

6) Click **Save** to create the report. When you click **Save**, you will be navigated back to the **Searches, Reports, and Alerts** page.

7) On the **Searches, Reports, and Alerts** page, select **Search & Reporting (search)** from the app drop-down field.

8) Navigate to the report title that you have created, then click **Edit** to schedule the report.

9) Click **Edit** and select the **Edit Schedule** option.

10) On the **Edit Schedule** screen, select the **Schedule Report** check box.

11) From the **Schedule** drop-down field, select **Run on Cron Schedule**.

12) In the Cron Expression input field, enter the cron format to specify the cron schedule for running the report. For example, enter */2 * * * * to schedule the cron after every 2 minutes.

13) In the **Time Range** field, select the **All time** option to pull all the index data.

14) Click **Save**.

Create KB CSV Lookup Definition on the Search Head

These steps let you access the KB CSV file data using the lookup.

1) Go to **Settings > Lookups** and on the **Lookups** page, click **Add New** in the Lookup definitions row to create lookup for KB CSV file.

2) From the Destination app field, select the **search** option to select the destination app to be used for the lookup.

3) In the **Name** field, enter a name as qualys_kb_lookup.

4) From the **Type** field, select the **File-based** option.
5) From the **Lookup** file field, select the **qualys_kb.csv** option.

6) Click **Save** to create the KB CSV lookup.

**What happens when you disable KB indexing option after enabling it first?**

When you disable KB indexing after enabling it first, the user may not get updated data or see blank dashboard. This is so because on disabling the KB indexing, the lookup file generated from the scheduled search will be removed from “SPLUNK_HOME/etc/apps/search/lookups/” directory. As a result, TA will read the lookup file that is now generated in the default “SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/lookups/” directory.

To see updated data or not to see blank dashboard, you should disable the scheduled saved searches when you disable KB indexing after enabling it first. You need to disable the scheduled saved searches as the scheduled saved searches when run won’t fetch latest KB data if the KB indexing option is disabled.

**What happens when you enable the “index KnowledgeBase data” option?**

When you enable indexing, TA determines if the KB data is getting indexed for the first time into Splunk or KB data has been indexed before. If TA determines that the KB data is indexed the first time, then the entire KB data from 1999-01-01 is pulled. TA pulls the entire data so that the KB data which you could see before upgrading TA will be available to you in the new version. On the other hand, if KB data has been indexed before, then TA uses the KB checkpoint date of the last run to pull the KB data.

**How TA determines if the KB data is getting indexed for the first time?**

When you upgrade Splunk TA to 1.8.4 or later and choose to index the KB data into Splunk, TA will determine if the KB indexing option is enabled for the first time. TA does this by checking if the KB checkpoint file is empty and if the KB CSV file exists. Note that TA creates a KB CSV file when you upgrade Splunk TA to 1.8.4 or later. If TA finds these 2 conditions true, then TA will fetch the KB data from 1999-01-01, update the KB checkpoint file with the latest date and time, and remove the KB CSV file from the lookup folder if it exists.

Later, if you delete the KB checkpoint file or clear the KB checkpoint file data, then before indexing the KB data, TA will check that the KB checkpoint file is empty and the KB CSV file doesn’t exist. If these 2 conditions are found true, then TA will assume that the KB indexing option is enabled not for the first time. In this case, TA will use the start date provided on the KB input data form to pull the KB data from your Qualys account and update the KB checkpoint file with the latest date and time.

Note that if the index KB check box is not selected, TA will generate the KB CSV file but TA does not update the KB checkpoint file.
Proxy Configuration
Provide the proxy server IP address and credentials for Qualys API requests.

Preserve API Output
Select this check box to save the API output files in Splunk. By default, this check box is not selected. When checked, TA will preserve JSON/XML files of API output for all the modules for which TA is configured to pull the data from your Qualys cloud.

Configure Data Sync
TA-QualysCloudPlatform pulls Qualys data and indexes in Splunk on a regular basis. Scripts parse and convert the Qualys API output to Splunk friendly format (CIM-compliant in Splunk parlance).

Go to Settings (on the top menu) and select Data Inputs.
Then click the “Add new” link for the Qualys Technology Add-On, as shown below.

Choose the Qualys metric (data feed input) you’re interested in, specify when to start pulling data and how often. Then click Next. Repeat these steps for each metric you want.

For VM data, choose knowledge_base and host_detection. You need to create 2 data inputs. One for knowledgebase and another for host detection.

For PC data, choose policy_posture_info.

For WAS data, choose knowledge_base and was_findings. You need to create 2 data inputs. One for knowledgebase and another for was findings.

For CS image data, choose cs_image_vulns.

For CS container data, choose cs_container_vulns.

For FIM events data choose fim_events.

For FIM ignored events data choose fim_ignored_events.

For FIM incidents data choose fim_incidents.
For EDR data choose edr_events.
For Activity Log data choose activity_log.

Tip – When setting the interval, keep in mind your Qualys scanning schedule. If you’re scanning weekly, you don’t need to sync data daily.

**Does the script pull all data or deltas only?**
The first time a script runs it pulls all data from your Qualys account. After that it pulls only the changes.

**Qualys data is added to Splunk**
You’ll notice each scan has a separate entry in Splunk. If you purge hosts using your Qualys account the data is not removed from Splunk.

**How to assign a custom index to an event type?**
From TA v1.7.1 onwards, we are not supporting macro definition for indexes.

Specify a custom index from UI

Go to Settings > Event types and from the App drop-down select Qualys Technology Add-On for Splunk. Navigate to the event type that you want to update. Click the event type and update the search string to specify index=<name of the custom index>.

Specify a custom index from CLI

To set custom index, copy the eventtype.conf file from $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/default/ to $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/local/ and update the search string of the required event type to specify index=<name of the custom index>. Then restart Splunk.
Enable the Data Feed to Start in Splunk

Return to Settings > Data Inputs > Qualys Technology Add-On. You’ll see each of the Qualys metrics you selected. Make sure you enable these.

Once you enable data feeds, check the $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/tmp directory on your search head to see the XML files begin to download. Depending on how much data there is, it can take from hours to days to download the first data set.

Note that for all FIM data inputs, choose a date equal to or greater than 2017-01-01T00:00:00.000Z.

How to setup for a Search Head Cluster

1) Install Qualys TA on your Forwarder. Depending on the type of data you want to ingest, add and enable all or any of these data inputs: host_detection, was_findings, policy_posture_info.

2) Use Deployer to push Qualys visualization apps.

3) On each Search Heads, manually configure the event types. To add event types, go to Settings > Event types. On the Event types page, click New Event Type. In the Add new page, provide the search string for the new event type and click Save.
How to index KB data into Splunk

We support indexing of the KnowledgeBase (KB) data in Splunk so that the Splunk TA users on the distributed setup environment can get the updated KnowledgeBase data on the Search Head from the Heavy Forwarder.

On the TA set up page, we added a KnowledgeBase Settings section that has a check box “Index the KnowledgeBase. CSV lookup...”.

The check box indicates whether to index the KnowledgeBase data in Splunk or to write the data into a CSV file. When you select the check box and click Save, TA will fetch the KB data and index the KB data in Splunk. If the check box is not selected, TA does not index the KB data into Splunk and creates a CSV file. The CSV file will have KB data from 1999-01-01.

On the Settings > Data Inputs > Add Data page for Qualys technology add on, we added the information that for knowledge_base “Start Date” field is applicable only if the “Index the KnowledgeBase. CSV lookup...” option is enabled for the Knowledge Base settings on the TA set up page.

After you enable the index KB data option, you need to generate KB CSV lookup on the Search Head. See KnowledgeBase Settings.
How to get the RESULTS field indexed in host detection input

Update optional parameters on the TA setup page to include “show_results=1”. Already have optional parameters listed? Simply append this with an '&' sign, for example “show_tags=1&show_results=1”.

How to populate the SOLUTION section in the KB lookup file

You’ll need to edit the kbpopulator.py script used to populate the KB lookup file. The KB lookup file is: $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/lookups/qualys_kb.csv

1) Go to $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform. Use this command:
   cd $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform

2) Backup this file:
   $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/bin/qualysModule/splunkpopulator/kbpopulator.py

3) Open kbpopulator.py and do the following:
   Find this line and remove # from the beginning of the line (uncomment it):
   # QID_EXTRA_FIELDS_TO_LOG = ["VULN_TYPE", "PATCHABLE", "PCI_FLAG", "TITLE", "CATEGORY", "DIAGNOSIS", "CONSEQUENCE", "SOLUTION", "PUBLISHED_DATETIME"]
   Find this line and add # to the beginning of the line (comment it out):
   QID_EXTRA_FIELDS_TO_LOG = ["VULN_TYPE", "PATCHABLE", "PCI_FLAG", "TITLE", "CATEGORY", "PUBLISHED_DATETIME"]
   The 2 lines should look like this when you’re done:
   QID_EXTRA_FIELDS_TO_LOG = ["VULN_TYPE", "PATCHABLE", "PCI_FLAG", "TITLE", "CATEGORY", "DIAGNOSIS", "CONSEQUENCE", "SOLUTION", "PUBLISHED_DATETIME"]
   # QID_EXTRA_FIELDS_TO_LOG = ["VULN_TYPE", "PATCHABLE", "PCI_FLAG", "TITLE", "CATEGORY", "PUBLISHED_DATETIME"]

4) Save your changes to kbpopulator.py.

5) Let the knowledgebase input run according to your schedule or run it immediately using this command:
   cd $SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform
   $SPLUNK_HOME/bin/splunk cmd python /bin/run.py -k -s <your Qualys API server> -u <your Qualys API username> -p <your Qualys API password>
View your Qualys Data in Splunk!

We provide additional apps that make use of the data collected by the TA. You’ll get dashboards and reports, and you’ll be able to easily search your data.

Simply download and install these apps. There is no setup needed!

- Qualys VM App for Splunk Enterprise
- Qualys PC App for Splunk Enterprise
- Qualys WAS App for Splunk Enterprise
- Qualys CS App for Splunk Enterprise
- Qualys FIM App for Splunk Enterprise
- Qualys EDR App for Splunk Enterprise

Once installed, you’ll see new apps on your Splunk Home page. Click any app on your Home page to view data.
View your Qualys Data in Splunk!

Sample VM Dashboard

Sample WAS Dashboard
View your Qualys Data in Splunk!

Sample PC Dashboard

Sample CS Dashboard
Sample FIM Dashboard

176,850

Events by Severity

File & Directory Changes by Change Action

Top Changes by User

Top Changes by Process

Changes by OS
Sample EDR Dashboard

Search Your Qualys Data

Choose Search & Reporting on the Splunk Home page. Then enter your search query in the search field. Here are some sample search queries to get you started.

Most Prevalent Vulnerabilities
Host Distribution by OS

Scan Volume
Search Container Security Data

CS data is in JSON format. TA indexes CS events in a structured format. You can search the CS data in Splunk using DOT notation.

Use these event types to search for different types of container data: cs_image_info_event to search for vulnerabilities of images, qualys_cs_container_details, qualys_cs_container_vuln to search for container data and qualys_cs_container_vuln_summary to search for container vulnerabilities.

For more information on creating search queries to filter CS data, refer to the Splunk Search Reference.

Sample JSON query to filter images matching a registry object in a repo list
eventtype="cs_image_info_event"
## Search Your Qualys Data

View your Qualys Data in Splunk!

### New Search

- **Event:** *msg* = *snap_* *msg*, *event*

- **Fields:**
  - *msg* = *snap_* *msg*, *event*
  - *created* = *2012-01-23T13:54:16Z*
  - *ipAddr* = *192.168.0.1*
  - *serviceType* = *HTTP*
  - *serviceName* = *HTTP*
  - *destination* = *
  - *status* = *

- **Time Range:**
  - *Start Time* = *
  - *End Time* = *

- **Search Results:**
  - *Message*: *snap_* *msg*, *event*

- **Actions:**
  - *Create Table View*
Search Your Qualys Data
View your Qualys Data in Splunk!

Sample JSON query to search images with a specific vulnerability severity count
`eventtype="cs_image_info_event" "vulnerabilities.severity2Count"="2"`
Sample JSON query to search vulnerabilities on running containers:

```
eventtype=qualys_cs_container_vuln [search eventtype=qualys_cs_container_details state=RUNNING | dedup containerId | fields + containerId]
```

You can use the Debug option to view debug information for one or more data input parameters.
Search FIM Data for Events and Incidents

FIM events, Ignored events and incidents ingested in splunk can be searched using their eventtype. Further, user can search them using SPL of desired filters.

Here are some sample queries for searching FIM data in Splunk.

**Sample query to search for FIM events**

```
eventtype="qualys_fim_event"
```

**Sample query to search for FIM ignored events**

```
eventtype="qualys_ignored_fim_event"
```
Sample query to search for FIM incidents

eventtype="qualys_fim_incident"
Search EDR Data

You can search for specific EDR events that TA has pulled in Splunk from your Qualys account. Use `eventtype="qualys_edr_event"` or create your own SPL search query to filter the data.
Search Activity Log Data

You can search for specific Activity Log events that TA has pulled in Splunk from your Qualys account. Use eventtype="qualys_activity_log_event" or create your own SPL search query to filter the data.
Event Types for Searching your Apps Data

Here is the list of default event types for Qualys Apps. You can use these event types when searching your Apps data in Splunk.

Note - If the customer has used custom index then replace {INDEX_NAME} with custom index name else replace with main.

**Event types for VM Detection data**

1) Event Type Name - qualys_vm_detection_event
   Search Query - index={INDEX_NAME} (sourcetype="qualys:hostDetection" OR sourcetype="qualys_vm_detection") "HOSTVULN"

2) Event Type Name - qualys_host_summary_event
   Search Query - index={INDEX_NAME} (sourcetype="qualys:hostDetection" OR sourcetype="qualys_vm_detection") "HOSTSUMMARY"

**Event types for WAS Findings data**

1) Event Type Name - qualys_was_finding_event
   Search Query - index={INDEX_NAME} sourcetype="qualys:wasFindings" "WAS_FINDING"

2) Event Type Name - qualys_was_summary_event
   Search Query - index={INDEX_NAME} sourcetype="qualys:wasFindings" "WAS_SUMMARY"

**Event types for Policy Compliance data**

1) Event Type Name - qualys_policy_info_event
   Search Query - index={INDEX_NAME} sourcetype="qualys:pc:policyInfo" "POLICY_INFO"

2) Event Type Name - qualys_posture_info_event
   Search Query - index={INDEX_NAME} sourcetype="qualys:pc:postureInfo" "POSTURE_INFO"

3) Event Type Name - qualys_policy_summary_event
   Search Query - index={INDEX_NAME} sourcetype="qualys:pc:postureInfo" "POLICY_SUMMARY"

**Event types for container Security data for images**

1) Event Type Name - cs_image_info_event
   Search Query - index={INDEX_NAME} sourcetype="qualys:cs:csimageinfo" "IMAGE_INFO"

2) Event Type Name - cs_vuln_info_event
   Search Query - index={INDEX_NAME} sourcetype="qualys:cs:csimagevulninfo" "VULN_INFO"
Event Types for Searching your Apps Data

3) Event Type Name - cs_vuln_summary_event
Search Query - index=[INDEX_NAME] sourcetype="qualys:cs:csimagevulninfo" "VULN_SUMMARY"

Event types for Container Security data for containers
1) Event Type Name - qualys_cs_container_details
Search Query - index=[INDEX_NAME] sourcetype="qualys:cs:container" "CONTAINERDETAILS"
2) Event Type Name - qualys_cs_container_vuln
Search Query - index=[INDEX_NAME] sourcetype="qualys:cs:containerVuln"
   type=CONTAINER_VULN
3) Event Type Name - qualys_cs_container_vuln_summary
Search Query - index=[INDEX_NAME] sourcetype="qualys:cs:containerVuln"
   type=CONTAINER_VULN_SUMMARY

Event types for FIM data for events, ignored events, and incidents
1) Event Type Name - qualys_fim_event
Search Query - index=[INDEX_NAME] sourcetype="qualys:fim:event"
   splunk_event_type=FIM_EVENT
2) Event Type Name - qualys_ignored_fim_event
Search Query - index=[INDEX_NAME] sourcetype="qualys:fim:ignored_event"
   splunk_event_type=FIM_IGNORED_EVENT
3) Event Type Name - qualys_fim_incident
Search Query - index=[INDEX_NAME] sourcetype="qualys:fim:incident"
   splunk_event_type=FIM_INCIDENT

Event types for Endpoint Detection and Response (EDR) data
Event Type Name - qualys_edr_event
Search Query - index=[INDEX_NAME] source="qualys"
   sourcetype="qualys:ioc:ioceventinfo" OR sourcetype="qualys:edr:event"

Event types for Activity log data
Event Type Name - qualys_activity_log_event
Search Query - index=[INDEX_NAME] sourcetype="qualys:activityLog"
App Management & Troubleshooting

APP Management

How to remove the app

1) Stop Qualys App for Splunk Enterprise:

   $SPLUNK_HOME/bin/splunk stop

2) Remove Qualys App for Splunk Enterprise:

   $SPLUNK_HOME/bin/splunk remove app TA-QualysCloudPlatform -auth
   username:password

Note: To remove the TA app from Splunk cloud, raise a ticket with Splunk Support.

Utility script to clean up left-over XML and PID files

You’ll sometimes see orphan XML files in the TA-DIR/tmp directory when TA has errors, for example while calling the API, getting the response stream or parsing the API response. While running the utility, you can provide command line options to specify data input(s) for the XML files to be cleaned up. The utility will delete all the XML files related to the chosen data input(s), except those belonging to currently running TA processes.

Example 1: Help: Use the below command to understand how utility script can be used for specific data inputs

   my-user@my-host:$SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform#
   $SPLUNK_HOME/bin/splunk cmd python ./bin/cleanup.py --help

Example 2: Delete Host Detection and WAS Findings XML

   my-user@my-host:$SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform#
   $SPLUNK_HOME/bin/splunk cmd python ./bin/cleanup.py --hd --was

Example 3: Delete XML files belonging to all data inputs

   my-user@my-host:$SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform#
   $SPLUNK_HOME/bin/splunk cmd python ./bin/cleanup.py --all
## Know important file paths in Splunk

<table>
<thead>
<tr>
<th>File</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>$SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/default/eventtype.conf</td>
</tr>
<tr>
<td>KB lookup</td>
<td>$SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/lookups/qualys_kb.csv</td>
</tr>
<tr>
<td>API Credential</td>
<td>$SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/local/passwords.conf</td>
</tr>
<tr>
<td>Qualys TA Configuration</td>
<td>$SPLUNK_HOME/etc/apps/TA-QualysCloudPlatform/local/qualys.conf</td>
</tr>
<tr>
<td>Qualys TA log</td>
<td>$SPLUNK_HOME/var/log/splunk/ta_QualysCloudPlatform.log</td>
</tr>
<tr>
<td>Check point</td>
<td>$SPLUNK_HOME/var/lib/splunk/modinputs/qualys</td>
</tr>
</tbody>
</table>
Troubleshooting

Looking for logs?
Qualys logs are populated in Splunk’s index “_internal”. Use this search to find logs:

```
index=_internal source="$SPLUNK_HOME/var/log/splunk/ta_QualysCloudPlatform.log"
```

Troubleshooting the setup
- Be sure to enter the proper API Server URL for the configuration.
- Verify you can reach the API from the Splunk Search Head where you installed Qualys App for Splunk Enterprise (no firewall or other infrastructure).
- Be sure the Qualys user account you’re using to connect has API access. Edit the user account in the Qualys UI and select the API access check box in the user settings. Don’t see this option? Reach out to Qualys Support or your Technical Account Manager.

Check that API calls are being made
In the Splunk setup where failing account is used, run the following search to see if API calls are being made to Qualys APIs:

```
index=_internal source="$SPLUNK_HOME/var/log/splunk/ta_QualysCloudPlatform.log" (/api/2.0/fo/asset/host/vm/detection/" OR "/api/2.0/fo/knowledge_base/vuln/" OR "/api/2.0/fo/compliance/posture/info/" OR "/qps/rest/3.0/search/was/finding")
```

Check that data feed is enabled
If you don’t see any entry for the API call, then check that the data input was added and enabled.
- If not enabled, please enable it.
- If enabled, and you still don’t see any records for the API call, please check the TA installation directory. If you find the host_detection.pid file in the installation directory, delete it.

Note that you should see entries for the /api/2.0/fo/knowledge_base/vuln/ API call.

Check error logs
If everything is fine (inputs added and enabled; API calls are made) and you still don’t have data, please check “_internal” index for errors logged for TA-QualysCloudPlatform.

Run the following search and provide error logs to Qualys Support:

```
index=_internal source="$SPLUNK_HOME/var/log/splunk/ta_QualysCloudPlatform.log" ERROR:
```

Delete the checkpoint file and pull the data again for a Qualys module
Navigate to $SPLUNK_HOME/var/lib/splunk/modinputs/qualys/. Delete the checkpoint file of the desired module. For example, Delete ‘host_detection’ file for module Host Detection and initiate the pull once again. TA will now pull the data from the date configured in Data Input Settings for the respective Qualys module.
## Troubleshooting

### App Management & Troubleshooting

**qualys.py is running even after the data input is disabled or Splunk is restarted**

This issue is seen mostly on Ubuntu OS, that has default shell set to 'dash'. To fix this issue, set the default shell from 'dash' to 'bash'.

Steps to change the Ubuntu configuration:

1)  `~# debconf-show dash
   * dash/sh: true

2)  `~# debconf-set-selections <<< "dash dash/sh string false"

3)  `~# debconf-show dash
   * dash/sh: false

4)  `~# dpkg-reconfigure -f noninteractive dash

   Removing 'diversion of /bin/sh to /bin/sh.distrib by dash'

   Adding 'diversion of /bin/sh to /bin/sh.distrib by bash'

   Removing 'diversion of /usr/share/man/man1/sh.1.gz to /usr/share/man/man1/sh.distrib.1.gz by dash'

   Adding 'diversion of /usr/share/man/man1/sh.1.gz to /usr/share/man/man1/sh.distrib.1.gz by bash'

5)  `~# debconf-show dash
   * dash/sh: false

**How to switch python interpreter for Python3?**

1) Goto the path - `$SPLUNK_HOME/etc/system/local/server.conf`

2) Add the `python.version=python3` under [general].

3) Restart the Splunk.

**Blank dashboard for the KnowledgeBase data**

Perform these steps to identify and troubleshoot the issue:

- Check whether the correct index is used in the SPL added for the scheduled saved search.

- In case you disabled indexing after enabling it earlier, then check whether the scheduled saved search is also disabled as it is running for the index in which data is not updated.

- Go to the Settings > Lookups > Lookup table files and on the Lookup table files page select “All” from the App drop-down field. Check `qualys_kb.csv` is generated for which app. On enabling the indexing, the file should be present for 'search' app and on disabling the
indexing, the file should be present for 'TA-QualysCloudPlatform' app. If qualys_kb.csv is present for any other app, then you should delete the file for that app else you may get to see blank KnowledgeBase dashboard.

**URL to the Qualys API Server**

The Qualys API URL you should use for API requests depends on the Qualys platform where your account is located.

Click [here](#) to identify your Qualys platform and get the API URL.

You can easily find the API server URL for your account. Log in to your Qualys account and go to Help > About. You’ll see this information under Security Operations Center (SOC).
What’s New

Improvements in 1.8.9

Indication of Compromise (IOC) App rebranded as Endpoint Detection and Response (EDR)

With this release, Indication of Compromise (IOC) App will be known as Endpoint Detection and Response (EDR) in Qualys TA. Because of this change, we replaced all the instances of IOC on TA UI (labels, IOC data input), log messages with EDR.

If you are using IOC data input and choose to upgrade to TA 1.8.9, we will show you a warning message in the TA log for IOC data input. The warning message will inform that IOC data input is deprecated and you need to manually configure the EDR data input from the Splunk UI.

If you are using IOC data input and if you enable the new EDR data input, we check if IOC data checkpoint is available or not. After the check, if we find IOC checkpoint file and do not find EDR check point file then TA will rename the IOC checkpoint file to the EDR checkpoint file and consider IOC checkpoint as the start date to fetch the data for the EDR data input.

If both the IOC and EDR checkpoint is available then TA will fetch the data from the EDR checkpoint file and ignore the IOC checkpoint file.

We removed the event types of IOC data input. The new event type name for EDR data input is "qualys_edr_event". For backward compatibility that is to make the older IOC data available in Splunk along with the EDR data, we have merged the IOC and EDR source types into an EDR event type. When you use the EDR event type, we will fetch older IOC data for IOC data input and latest EDR data for EDR data input.

Note
As IOC App is deprecated, you need to manually add EDR and remove the IOC data input.

Issues Fixed

TA setup changes for Qualys API credentials

We had an issue where the users using multiple technology add ons of different organizations were unable to configure username and password from the TA setup page.

We fixed this issue by setting TA-QualysCloudPlatform-Api as realm name for Qualys API credentials in the passwords.conf file.

The realm name was not set in previous releases. Now you can update the username and password from the TA setup page only if the user with "TA-QualysCloudPlatform-Api" realm name exists in the passwords.conf file.

Note that this means if you are upgrading to TA 1.8.9, you have to again manually enter Qualys API credentials after the upgrade otherwise you wont be able to access the Qualys API server. Before entering the credentials, we recommend you to empty the cache of your browser and do a hard reload.
We will create a new entry for the username with the realm name in the passwords.conf file. This user name with realm name will be used to fetch data from your Qualys account.

**Add milliseconds in checkpoint file for FIM data inputs**

We fixed an issue where TA was not able to fetch FIM data because checkpoint date or start date is till seconds, whereas FIM supports date in the milliseconds (YYYY-MM-DDThh:mm:ss.msZ) format. To fix this issue, we now check the checkpoint or start date and add milliseconds to it if the checkpoint date is till seconds.

**Fixed incomplete API response XML file issue for Policy Compliance**

We fixed an issue where for Policy Compliance module, TA was unable to fetch data for PC data input and showed an error message if the PC API returns incomplete data or XML file. To fix this issue, now when TA will receive incomplete data or XML file, it will save this file as error file and will make the PC API call again to fetch the data from your Qualys account.

**Fixed 400 bad request issue for Container Security**

We fixed an issue where due to limitation of elastic search for Container Security data input if the page size is not equally divisible 10000 then the CS API was throwing 400 bad Request error. We have updated the logic so that elastic search limitation of 10000 is not violated when fetching CS data.

**Improvements in 1.8.8**

**TA to support date format in milliseconds for FIM data input**

As FIM now supports date in milliseconds format, TA will also accept date format with milliseconds to fetch FIM events, ignored events, and incident data. Due to this change, on the Data Input page, the start date to pull FIM data should be in UTC in ISO 8601 format: “YYYY-MM-DDThh:mm:ss.msZ”.

If the Start Date field is blank, then we set the default start date to 1999-01-01T00:00:00Z and pull the data from this date. But as FIM requires milliseconds in the date format, we will now show an invalid date format message if you leave the Start Date empty for any of the FIM Qualys Metrics. For FIM Qualys Metrics, you need to manually enter the Start Date in UTC in ISO 8601 format: “YYYY-MM-DDThh:mm:ss.msZ”.

We added this information on the Data Inputs screen (Settings > Data Inputs > Qualys Technology Add-On).

Note that if you are upgrading to TA 1.8.8 and you have already added FIM data inputs, then edit the data inputs as per the new date/time format and save it again to let the data input run successfully.
**What's New**

**Improvements in 1.8.7**

**Updated CS containers and CS images API Version to 1.3**

We updated CS Container and CS Image API version from 1.2 to 1.3 for CS container and CS image data inputs.

From this version onwards, use in the CS API request:

- SHA value of the image (imageSha) instead of image ID (imageId) to fetch the image details
- SHA value of the container (containerSha) instead of container ID (containerId) to fetch the container details.
- the pageNumber parameter instead of PageNo parameter to fetch the page with the specified number.

**Reset the username and password from the TA setup page**

We made an improvement where earlier if a user with two Qualys API accounts on a Qualys platform tried to switch between accounts by changing the Qualys API credentials from the TA setup page, then the password.conf file was required to be removed.

Now, as per the new flow, you do not have to remove the password.conf file while setting the Qualys API credentials from the TA setup page. When you enter the username on the TA setup page, we check if the username already exists in the password.conf file. If the username already exists then we only update the password.

If the username specified on the TA setup page does not exist in the password.conf file, then we fetch the old username from the password.conf file. If the old username is not blank in the file, then we delete the old credentials and add the new username and password specified on the TA setup page. In the case of a new user, we add the new username and password specified on the TA setup page.

**Show Splunk restart message when saving settings on TA setup page first time**

We will now show a message to “restart the Splunk to load all settings” after you save the settings on the TA setup page for the first time. Earlier, when the user was saving the TA setup form the first time and was not restarting the Splunk, then on the data input and event types pages, the TA setup form was shown instead of the respective forms.

**Added DISA STIG SV values to PC Data Input**

Policy Posture API response now has <REFERENCE> tag shown under <GLOSSARY>. We will show the value of the <REFERENCE> tag in Splunk when you search Policy Posture data using the posture info event. The value for the tag will be blank if the <REFERENCE> tag has no value.
Improvements in 1.8.6

Change in processing logic of PC data input

Prior to this release, PC data input was using the “policy_ids” parameter to pull posture information. With this release, we will use the “policy_id” instead of the “policy_ids” parameter to pull the posture information. As per the new logic, TA will first fetch all the policy IDs using the Compliance Policy List API and then for each policy_id, it will fetch the posture information using the Compliance Posture Information API.

As a result of this change, on the TA setup page, we removed the “Number of POLICY IDs to use for PC Posture Information (max 10)” option and added the “Number of posture info records per API request” option for PC posture API request. The value in this field will be used for the “truncation_limit” parameter of the PC posture API request and define how many posture info records will be returned per request. If the requested list identifies more records than the truncation limit, then the XML output includes the <WARNING> element and the URL for making another request for the next batch of records.

The default value is 1000. If you want to fetch all the posture information in a single output then specify 0. Paginated output is recommended if the posture info data is large.

Change in XML input file parsing logic for performance improvement

We changed the parsing logic for the XML input files to improve the processing time of XML files. TA now does not load the full XML input file in the Splunk memory which was making the system slow and causing the XML processing to take longer time. To improve the performance, TA now parses the XML file line by line or tag by tag.
What’s New

Improvements in 1.8.5

Added three new fields in the VM Detection Setting section on the TA set up page

We have added three new fields: “Host fields to log”, “Detection fields to log”, and “Max characters allowed in RESULTS field” in the VM Detection Settings section on the TA Set up page.

1) "Host fields to log" shows default output values for host assets. You can add additional comma-separated host XML tag names such as “Asset_ID” returned in the Host List API response that you want to log into the event or remove any existing tag that you don’t want to log.

2) “Detection fields to log” shows default output fields for host detection. You can add additional comma-separated detection XML tag names such as “AFFECT_EXPLOITABLE_CONFIG” and “AFFECT_RUNNING_KERNEL” returned in the Host List Detection response that you want to log in the event or remove any existing tag that you don’t want to log.

3) Max characters allowed in the RESULTS field lets you specify how many maximum characters will appear in the Results field. This means if the number of characters exceeds the maximum allowed characters, then TA will truncate the excess characters after parsing the RESULTS field and append the message “[TRUNCATED XXX Characters]” in the RESULTS field.

The “RESULT_TRUNCATED” field now shows values based on whether the RESULT field is truncated by the TA or Splunk.

1) RESULT_TRUNCATED is “0” if neither TA nor Splunk truncates the RESULTS field/raw event.
2) RESULT_TRUNCATED value is “1” if the RESULTS field is truncated by Splunk. Note that if Splunk truncates the RESULTS field then the message “[TRUNCATED XXX Characters]” in the Results field is not shown.

3) RESULT_TRUNCATED value is “2” if the RESULTS field is truncated by TA. Note that if TA truncates the RESULTS field then the message “[TRUNCATED XXX Characters]” in the Results field is shown.

**Improvements in 1.8.4**

**Added option to index the KB data in Splunk**

With this release, we now support indexing of the KnowledgeBase (KB) data in Splunk so that the Splunk TA users on the distributed setup environment can get the updated KnowledgeBase data on the Search Head from the Heavy Forwarder and generate the KB CSV file.

On the TA setup page, we added a KnowledgeBase Settings section that has a check box "Index the KnowledgeBox...”.

The check box indicates whether to index the KnowledgeBase data in Splunk or to write the data into a CSV file. When you select the check box and click Save, TA will fetch the KB data and index the KB data in Splunk. If the check box is not selected, TA does not index the KB data into Splunk and creates a CSV file.
The CSV file will have KB data from 1999-01-01.

On the Settings > Data Inputs > Add Data page for Qualys technology add on, we added the information that for knowledge_base “Start Date” field is applicable only if “index the knowledge base” is enabled on the TA set up page.

After you enable the index KB data option, you need to generate KB CSV lookup on the Search Head. See KnowledgeBase Settings.

**CS image label Information now available in CS events**

You will now see the CS label information along with the CS image vulnerabilities in CS events for images in Splunk. TA uses a new API "/csapi/v1.2/images/<imageId>" to fetch the CS label and image vulnerability information. TA uses the label key to fetch the label information and the "vulnerabilities" key to fetch the vulnerability information. The image vulnerabilities & label information will be available in cs_vuln_info_event event type.

The new API does not provide image vulnerability summary information in the response. TA generates vulnerability summary information with the help of severity and patch availability fields of vuln summary information. All this vulnerability summary information will be available in the cs_vuln_summary_event event type.

**Improvements in 1.8.3**

We have fixed these issues in 1.8.3.

**Issues Fixed**

- We fixed an issue where the check box selection values for “log host summary events” and “Log Individual Host Vulnerabilities” options in the TA set up > VM Detection settings section was read from the app configuration file instead of qualys.conf file.
- We fixed an issue where TA was logging “VM host summary events for host detection” in Splunk even though the user had configured to exclude the VM host summary events on the TA setup page.

- We fixed an issue where WAS summary events weren’t fetched for all the threads when the WAS data was fetched using multiple threads. Now when the WAS data is fetched in the multi-thread mode, TA logs events in Splunk from all the threads.

- We fixed an issue where TA throws an error and terminates the WAS API call when the WAS data input is fetched using multiple threads and the web application IDs are not distributed appropriately to each thread. To fix this error, we have changed the logic of distribution for web application IDs between the threads so that web application IDs are appropriately distributed.

**Improvements in 1.8.2**

**Enhancements to VM Detection Event**

With this release, we have moved the Result field in the VM Detection event to the end of the event. When the Result field is placed before the other event fields, Splunk, at the time of processing the VM Detection event data, truncates all the fields after the Results field if the size of the event exceeds the truncation limit. To avoid truncation of fields, we have added the Results field at the end of the event. Now only the values in the results field will be truncated, if the event size exceeds the truncation limit.

We have added a RESULT_TRUNCATED field before the “Results” field in the event to inform you that the event is truncated or not. RESULT_TRUNCATED = 1 means event is truncated and RESULT_TRUNCATED = 0 means event is not truncated. You can search for truncated and non-truncated events using this field.

TA will also remove the leading and trailing white spaces from the Results field after TA fetches VM detection data from your Qualys account using the Host List Detection API.

Splunk reads the truncate value from the props.conf file in the TA in “global/local” directory. If this file is removed from the app “global/local” directory, then TA will read the truncate value from the global props.conf file in Splunk. TA never truncates the event data while sending it to Splunk. Splunk automatically truncates the event if the size of the event exceeds the truncate limit set in the props.conf or global props.conf file.

**Note**
The VM Detection event shows the Results field when `show_results` is set to 1 in the “Extra Parameters” fields in VM Detection Settings on the TA setup page. If this parameter is not set, then none of these changes will have any impact on the VM Detection Event data.

**Improvements in 1.8.1**

**Cleanup Script to remove API output files for Activity Log**

We added the “Activity Log” data input in the cleanup script to remove the API output files from the /tmp directory.

**Issue Fixed**

We fixed the byte string issue for the host detection data pulled in Splunk for versions above 8.x.x which uses Python 3 interpreter.

**Improvements in 1.8.0**

**Added a new data input - Activity Log**

We added a new data input “Activity Log” to TA to let you pull activity logs from your Qualys Account. To access data input page, go to Settings > Data > Data Inputs > Qualys Technology Add-On. Click Add and from Qualys Metrics drop-down, select activity_log.

**Page size field added for data inputs**

We added Page size field for these data inputs to let you specify the number of records to be fetched in single API call. The default value for page size is 1000 records, but you can change the value.

- Container Security Data Settings for Images
- Container Security Data Settings for Containers
- FIM settings for events
- FIM settings for ignored events
- FIM settings for incidents
- Indication of Compromise (IOC)
Redesigned TA setup form
We have redesigned TA setup form to make TA 1.8.0 Splunk cloud compatible as per the SplunkAppInspect tool suggestion and improve the user experience.

Issues Fixed
We have fixed the proxy server validation issue in this release.
You can now update Qualys’s password in the TA setup form without removing the password.conf file & restarting Splunk.
We now log the error in TA log if the CRON format of data input is invalid.

Improvements in 1.7.1
We made these improvements in 1.7.1
- TA is now compatible with both Python v2.7 and v3.7. See How to switch python interpreter for Python3?
- Container Security APIs now support the API gateway. Private cloud provider can use the gateway URL to connect to and fetch CS data from Qualys Cloud platform.

TA v1.7.1 no longer supports macro definition for indexes
Due to a known issue with Splunk, the user was getting a 255 error on the distributed Search Head setup. We have used macros for the ease of handling indexes and event types.
But in case of the distributed setup, macros definition was not getting expanded and as a result, the user was getting error on dashboard or while searching with event types.

To resolve this issue, the Splunk team has suggested not to use macros till further notice from them. See How to assign a custom index to an event type?

**Improvements in 1.6.7**

**Policy Compliance data to show additional fields**

You can now view REMEDIATION, RATIONALE, EVIDENCE and CAUSE_OF_FAILURE information in the compliance posture data for your policy.

To pull this data in Splunk, go to the TA setup page and in the “Policy Compliance Settings” section, select the “Add additional fields (REMEDICATION, RATIONALE, EVIDENCE, CAUSE_OF_FAILURE)” check box.

**Issues Fixed**

We fixed an issue where last evaluated date was not shown as the event date for the policy. Now if the policy has last evaluated date then we will show this date as the event date.
What's New

**Improvements in 1.6.6**

**TA to use “updated” dateTime to download Container and Images data in Splunk**

The new version of Container Security API uses a new parameter: “updated” to address the issue with mismatch count between Qualys UI and Splunk.

In TA 1.6.6, we now use the new parameter “updated” instead of “created” to ensure that all the Container and Images that were updated in particular duration gets synced in Splunk.

**Improvised Logging**

We have now improvised logging to print exception messages and avoid logging empty messages.

**Masked Passwords**

Previously, the password was in plain text. But, we now mask passwords in proxy authentication.

**Improved parsing for Host Detection RESULTS**

We have improvised Host Detection RESULTS section to address the issue of parsing RESULTS in upper case.

**Retry Interval**

We have introduced a new configuration `retry_interval_seconds` to retry same API request after configured interval, in case any error occurs while calling APIs.

Steps to configure `retry_interval_seconds`:

- edit qualys.conf file from below location:
  `<Splunk_Home>/etc/apps/TA-QualysCloudPlatform/local/qualys.conf`
- add below line to qualys.conf file
  ```
  retry_interval_seconds =<time_in_seconds>
  ```

**Improvements in 1.6.5**

**TA to use “processedTime” for downloading FIM Data in Splunk**

The new version 2.0.2.0 of FIM API has a new parameter “processedTime” to address the time lag issues with uploading the events on the Qualys portal by FIM agents.

In TA 1.6.5, we now use the new parameter “processedTime” instead of “dateTime” to ensure that all the FIM events that are generated in a particular duration are pulled in Splunk.

Due to this change, TA 1.6.5 will work only with FIM API version 2.0.2.0 and later and not with versions earlier than 2.0.2.0.
Improvements in 1.6.4

KnowledgeBase data to show BUGTRAQ_ID field
In Splunk, we will now show a new field “BUGTRAQ_ID” in KnowledgeBase data that is pulled from Qualys. This information is shown for QIDs that has “BUGTRAQ_ID” available.

FIM events to show event generated time in search results
When you search for FIM events in Splunk, the Time column in search results will now show you the time when the FIM event occurred as reported in your Qualys account. Earlier the time shown was the time when the event is pulled in Splunk.

Improvements in 1.6.3

Error on saving proxy server credentials
Fixed an issue where the TA user was getting an error when saving proxy server credentials required for authentication to the proxy server on the Qualys App set up page. Now the credential details are getting saved.

KnowledgeBase Data not populating in the solution section of the KB lookup file
We fixed an issue where the solution section in the KB lookup file (qualys_kb.csv) was not getting populated due to a failure in parsing of KnowledgeBase data. The parsing error occurred because the parameters “Threat_INTEL_IDs” and “Threat_INTEL_VALUES” were not found in the KB lookup file. We have added these two parameters in the KB lookup file.
Handle XML parsing error for WAS data
We fixed an issue where TA used to parse the WAS XML response file that had XML parsing errors. Now when TA will receive WAS data that contains parsing errors, it will not parse the file and request Qualys API server to resend the response file. TA will keep on requesting the WAS data from API server till it receives the data contains no parsing errors.

Certificate authentication failure when connecting to Qualys API server
We fixed an issue where authentication to the Qualys API server was getting failed when the user tried to connect to the API server via the proxy server using the certificate.

New Enhancements in 1.6.2
We have made the following enhancements in 1.6.2 release. TA can now:
- Pull EC2 metadata in host detection events using the extra parameter. For example, "host_metadata": "ec2", "host_metadata_fields": "region,accountId,instanceId".
- Pull “cwe” information in Qualys WAS events.
- Retry the request that failed due to corrupted response XML.

New Features in 1.6.1
You can now configure Qualys App for Splunk Enterprise to pull IOCevents data in Splunk from your Qualys account. We added a new Qualys metric (data input feed) “ioc_events” that you need to configure and enable for pulling the IOC events from your Qualys account. A new event type “ioc_info_event” is added for searching pulled IOC events in Splunk.

You can now preserve API output files in Splunk using the “Enable to preserve the XML/JSON files of API output” option. This option is available on the Qualys app setup page. By default, this check box will not be selected.
Added FIM Dashboard
We have also added a FIM dashboard to give you a graphical analysis of your FIM data pulled from your Qualys Account. You will see graphical data for total number changes, events by severity, file and directory changes by change action, and top changes by OS, user and process.

Multithreading not supported for FIM
We removed multithreading support for FIM as the new APIs (FIM API Version 2.0) do not support multithreading.

New Feature in 1.5.0
Qualys App for Splunk Enterprise can now pull FIM data for events, ignored events and incidents from your Qualys Account. On the TA set up page, you will now see 3 new sections: FIM Settings for Events, Ignored Events and Incidents. Specify configuration settings in these sections for collecting FIM data. Next, enable the FIM data feeds to pull the FIM data based on the configuration settings provided on the TA set up page.

New Features and Fixed Issues in 1.4.1
View Qualys Real-time Threat Indicators (RTIs) for vulnerabilities
We are now sending the Qualys Real-time Threat Indicators (RTIs) data in the data input for the Knowledge_base metric. Only, the user account with Threat Protection subscription can view this information for vulnerabilities found in the host based scans. You can set up your dashboard to monitor vulnerabilities for various threat level values. The sample search shows vulnerabilities for which threat value is High_Data_Loss.
eventtype=qualys_vm_detection_event | dedup 1 HOST_ID, QID | lookup qualys_kb_lookup QID OUTPUT THREAT_INTEL_VALUES | search THREAT_INTEL_VALUES=""High_Data_Loss"" | table HOST_ID, LAST_SCAN_DATETIME, QID, THREAT_INTEL_VALUES

Support for arf_kernel filters parameter for VM host detection
We now support “arf_kernel filters” parameter to identify vulnerabilities found on running or non-running Linux kernels. You can update the optional parameter to include the arf_kernel parameter in VM Detection Settings on the TA setup page.

Set show_results=1 to view TCP/UDP port information
We have fixed an issue where the user was unable to view the open TCP/UDP ports information in the HOSTSYMMARY events. To view the information, update optional parameters in VM Detection Settings on the TA setup page to include “show_results=1”.

Newline character removed from the port data in vulnerability data feed
We have fixed an issue where whitespace and newline characters in the port data in the Results tag in the vulnerability data feed fetched from the Qualys Server were introducing new events when imported in Splunk. Now, we have fixed this issue by removing these characters from the vulnerability data feed before importing it in Splunk.

Enable CVSS scoring in your account to view CVSS scores for vulnerabilities
We have fixed an issue where Splunk was showing an error for missing CVSS data when importing KnowledgeBase API response in Splunk TA. This issue was occurring for the user accounts that have CVSS Scoring not enabled for their subscriptions. As a result, the KnowledgeBase API response does not have CVSS data for vulnerabilities. To Enable CVSS Scoring in your Qualys account, go to "Reports > Setup > CVSS > Enable CVSS" and click "save".

Now, Splunk does not show missing CVSS data error if you do not enable CVSS scoring for your subscription. In this case, Splunk will show no CVSS metrics scores for vulnerabilities in the Splunk KnowledgeBase.
New Feature in 1.4.0

TA now supports ingesting Container Security data

Qualys App for Splunk Enterprise can now pull vulnerability information for docker image and container in Container Security from your Qualys account. TA pulls CS data based on the configuration information you have provided in the Container Security Settings for Images and Containers. CS data is in JSON format.

New Feature in 1.3.4

New information added in HOSTSUMMARY and HOSTVULN events

Added NETWORK_ID, LAST_VM_SCANNED_DATE and LAST_VM_SCANNED_DURATION information in HOSTSUMMARY.

```
HOSTSUMMARY: HOST_ID=2275208465, IP="104.154.69.105", TRACKING_METHOD="IP", NETWORK_ID="0", DNS="105.154.104.bc.googleusercontent.com", LAST_SCAN_DATETIME="2018-09-18T12:06:35Z", LAST_VM_SCANNED_DATE="2018-09-18T11:59:44Z", LAST_VM_SCANNED_DURATION="371", SEVERITY_1=5, SEVERITY_2=0, INFO=5, CONFIRMED=3, POTENTIAL=0, NEW=0, ACTIVE=3, FIXED=0, RE-OPENED=0, _SEVERITY_1=5, ACTIVE.SEVERITY_2=3, INFO.SEVERITY_1=5, CONFIRMED.SEVERITY_2=3, TOTAL.VULNS=8
```

Added LAST_FIXED_DATETIME, TIMES_FOUND, IS_IGNORED, IS_DISABLED information in HOSTVULN.

```
```

New Features in 1.3.3

New Basic option for fetching policy posture compliance data

You can now specify to Posture API to fetch only basic details of the policy posture compliance data for policy IDs. This option is for policy IDs with large posture compliance data. Keep the “Log All details (when unchecked, logs “Basic” details)” check box deselected in the Policy Compliance Settings for the API to get basic details.

Configure total number of policy IDs to be fetched

You can now configure in the Policy Compliance Settings the total number of policy IDs to be fetched by the Posture API. The valid number range is 1 to 10. Set this value low for policy IDs with large policy posture compliance data.
New Features in 1.3.1

Introducing new data input for Policy Compliance
TA is now able to pull and ingest Policy Compliance posture information! The TA Setup page includes new Policy Compliance configuration settings. The extra parameters option accepts API parameters for Posture Information API (/api/2.0/fo/compliance/posture/info/ with action=list). When pulling policies information, Posture API parameter policy_ids becomes the parameter ids for Policy detail API call.

Support for using client certificates to call API
Now you can specify a client certificate in TA so that TA uses it while making API calls. A new section has been added to the TA setup page for this.

New utility script to clean up left-over XML and PID files
This new script is useful for cleaning up orphan XML files in the TA-DIR/tmp directory. While running the utility, you can provide command line options to specify data inputs for the XML files to be cleaned up. The utility will delete all the XML files for the chosen data inputs, except those belonging to currently running TA processes.

Additional Improvements 1.3.1

Update to Host List Detection API
You’ll now see the parameter vm_processed_after in TA logs. With Qualys 8.9, we 1) changed the way we report host scan time so it’s based on when a scan finished, not when the scan started. 2) Introduced new parameters to filter the Host List VM Detection API by scan end dates and processed dates. The vm_processed_after parameter is used to filter the list to only show hosts with vulnerability scan results processed after a certain date and time.

Setup page save fails if there are any validation errors
TA will try to validate inputs given on the TA setup page. If validation fails, it will NOT save any details, but raise a ValueError. This results in a generic error message in the Splunk UI. You can see a more detailed error message given by TA in splunkd.log.

When installed on Search Head, do not run data inputs other than knowledge base
Checks were added to the code (with help from the Splunk team) to ensure that TA will only run the knowledgebase data input when TA is installed on a Search Head, even when other data inputs have been added and enabled. In other words, TA will not run host detection, WAS findings and PC posture information data inputs when installed on Search Head.

Log error messages given by Qualys API
If the Qualys API responds back with an error (in response body), TA will now log the error message in the TA log for troubleshooting. This way you’ll know if there’s an API reason for not getting data (e.g. Rate Limit exceeded).
What’s New

**PID repeat issue resolved**
TA writes PID in .pid file for every input run. This file is deleted at the end of the run. TA uses this pid file to check if any process with the PID is running. If it finds any such process, TA will check if the process is running qualys.py then only will it terminate itself, else TA will run the qualys.py script for the scheduled input.

**Configurable API Timeout period**
By default, the API timeout period is 300 seconds. If this value is not adequate you can set a different timeout value on the TA setup page.

**Display API parameters not allowed by TA**
To avoid operational problems, API parameters that are not allowed by TA are now clearly listed for each Extra API parameter field on the TA setup page.

**Log the index name being used in each run**
To help with troubleshooting, TA will now log the name of the index where data from each run will go into. This is the same index name as selected by the user while adding/updating the data input.

**Display data input name in each log entry**
There are some common execution paths for all data inputs in TA, and they write some log entries. When multiple data inputs are running at the same time, it becomes hard to identify which log entry was written for which data input. To fix this, TA will have a mention of data input it is running for in each log entry it writes. This way, one can grep all the log entries belonging to a particular data input. This would be useful if you are troubleshooting subsequent runs of the same data input.

**Avoid unnecessary call to msp/about.php each time Splunk invokes modular input**
Splunk invokes TA’s entry point script every 60 seconds. On each invocation, the code checks for the Qualys version by making a msp/about.php API call. This call was being made irrespective of whether the current time matched the configured cron/time interval. To avoid unnecessary calls, TA will first check if now is the time for any input to run. If yes, the API call is made. If no, the API call is not made.