FORESCOUT

OT Network Security Monitoring Add-on Module for Splunk

Installation/User Guide

Version 1.1 (February 19, 2021)

www.forescout.com

This document provides an overview and installation instructions applicable for version 1.1.0 of the OT Network Security Monitoring Alert Monitoring Add-on Module for Splunk.

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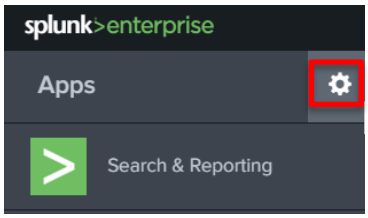
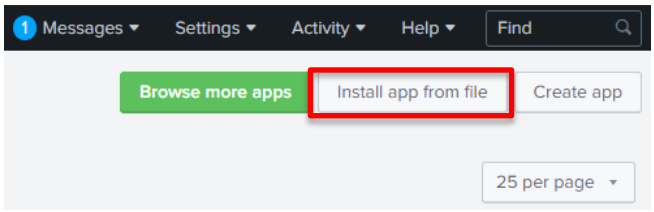
1. Installing OT Network Security Monitoring Add-on Module

From the Splunk web interface homepage menu on the left-hand side, click the cogwheel "Settings" button. You will navigate to a new page with installed Splunk applications and add-ons.

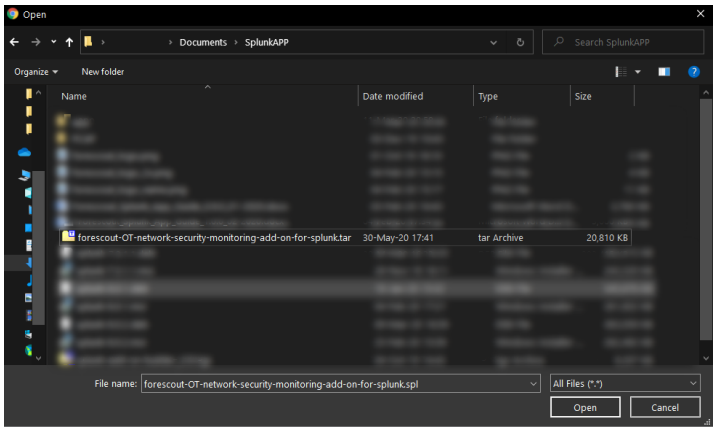


On the right-hand side, click "Install app from a file".

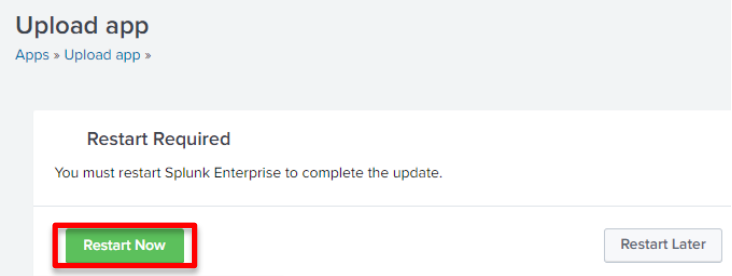


You will be forwarded to the "Upload an app" page. Click "Choose File."

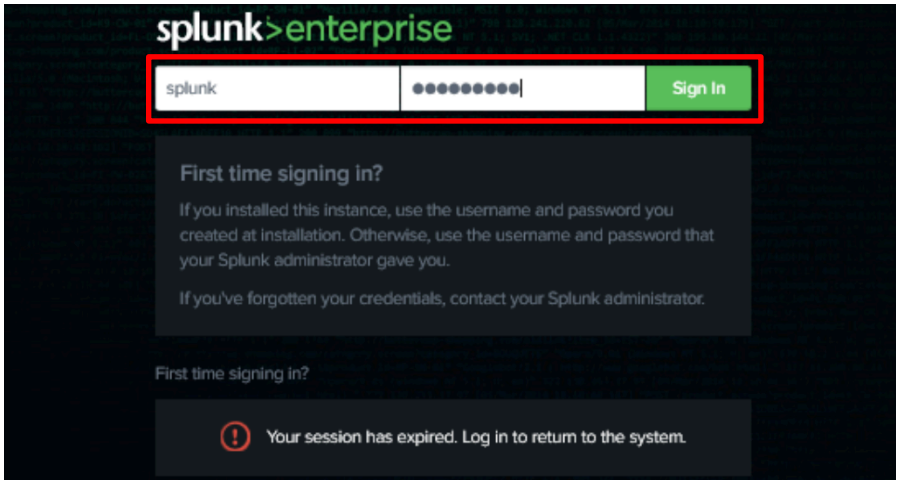
Select .spl (or .tgz) file that contains the OT Network Security Monitoring solution.



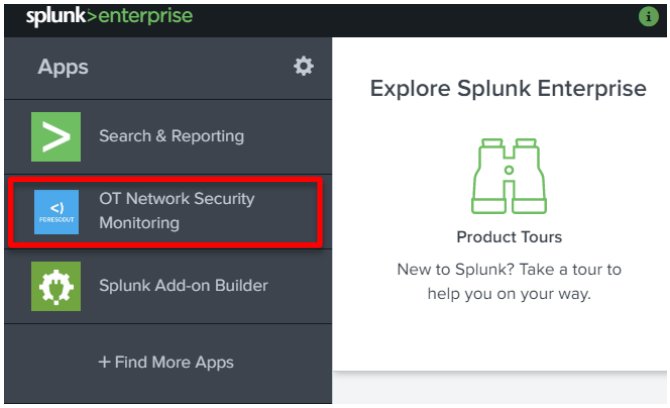
Click "Open," then "Upload" to complete the installation. After the process completes successfully, restart Splunk. If you do not see the dialog below, navigate to "Settings," then "Server controls," then choose "Restart Now."



Refresh the browser and log in to Splunk.

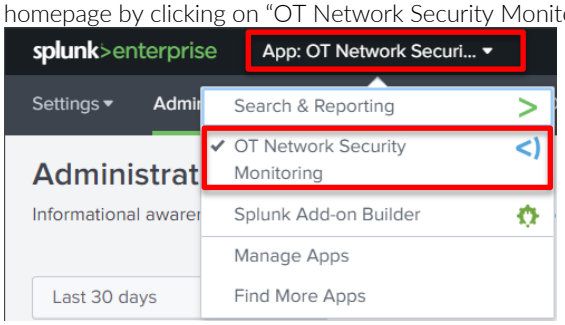


The OT Network Security Monitoring package is now available in the Splunk Apps Menu.

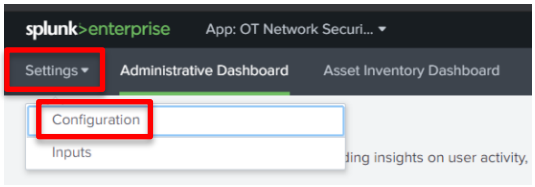


2. Configuring OT Network Security Monitoring Add-on Module

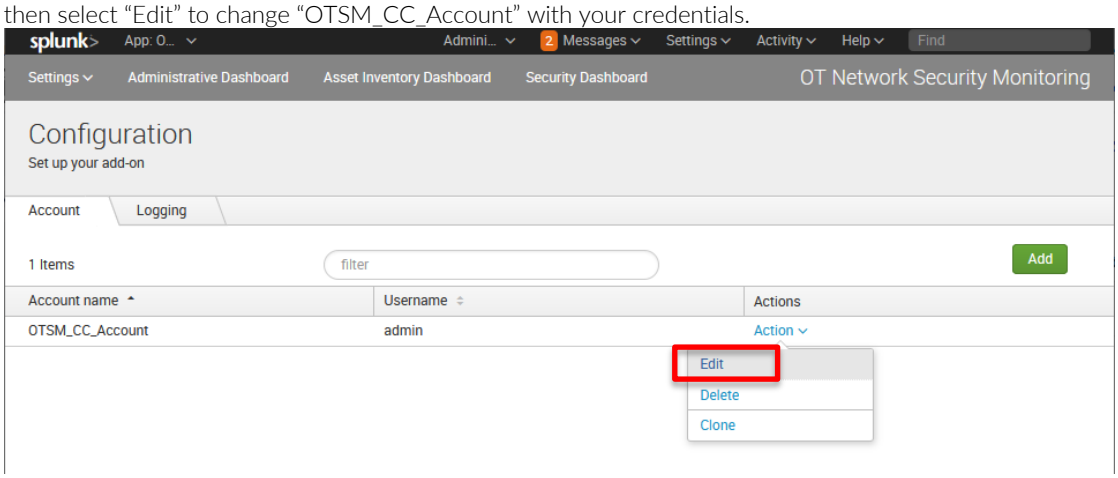
Before using the add-on, it must be configured. Navigate to OT Network Security Monitoring Alert Monitoring homepage by clicking on “OT Network Security Monitoring Alert Monitoring” in the Splunk apps drop-down menu.



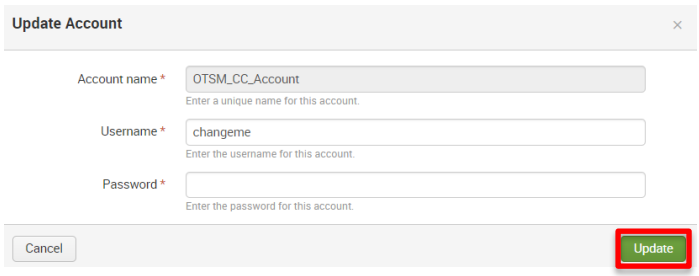
In the app homepage, you will see a tab bar menu. Click the “Settings” drop-down and go to “Configuration.”



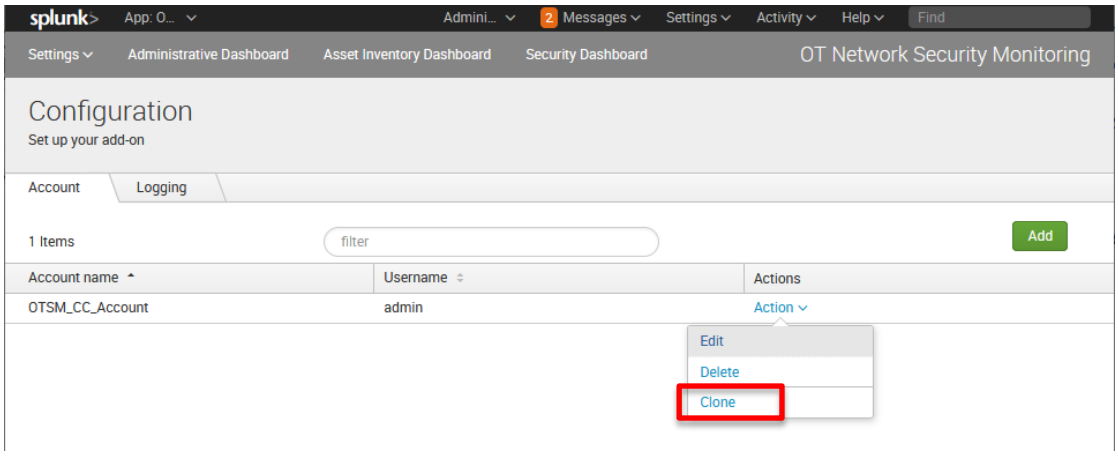
In the “Configuration” page, you will see a tab page control. In the “Account” tab, click on “Action” drop-down menu, then select “Edit” to change “OTSM_CC_Account” with your credentials.



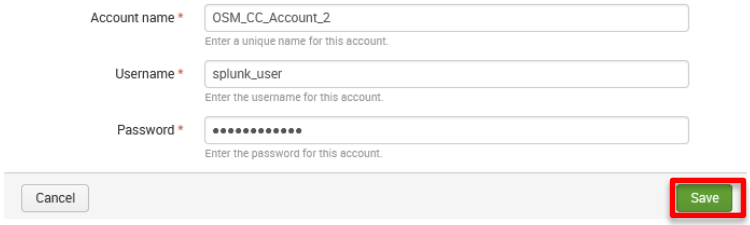
Enter your Command Center server credentials, then click “Update” to save your settings.



To connect to more than one Command Center, you need to add an account for each CC. On the “OTSM_CC_Account” row, click on “Action,” and then click on “Clone”.

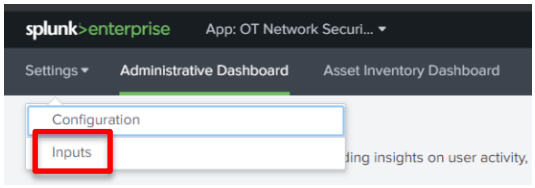


Enter an account name, the username and the password. Then, click on “Save”.

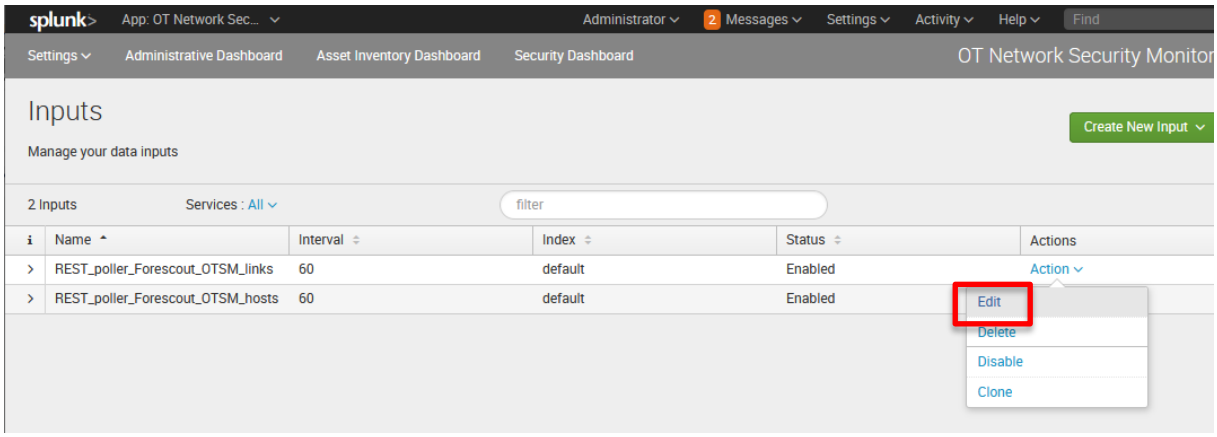


Repeat the last two steps for each Command Center installation that you wish to configure.

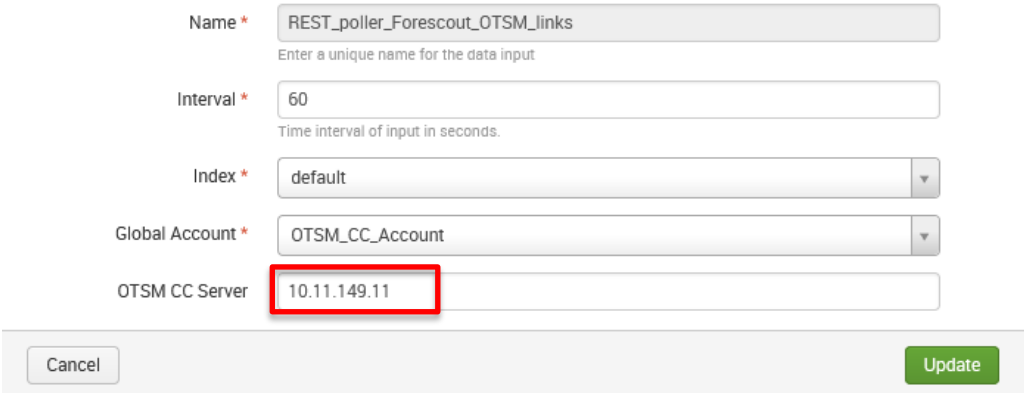
Next, click the “Settings” drop-down and go to “Inputs.”



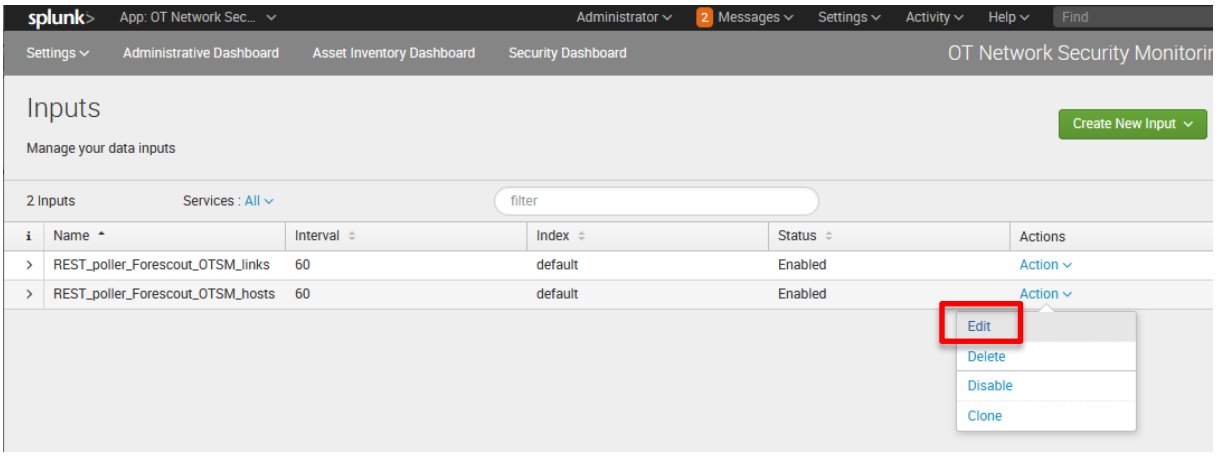
On the “Inputs” page, you will see two pre-defined inputs. In the input “REST_poller_Forescout_OTSM_links,” click on the “Action” drop-down menu, then click on “Edit” to specify the Command Center hostname/IP.



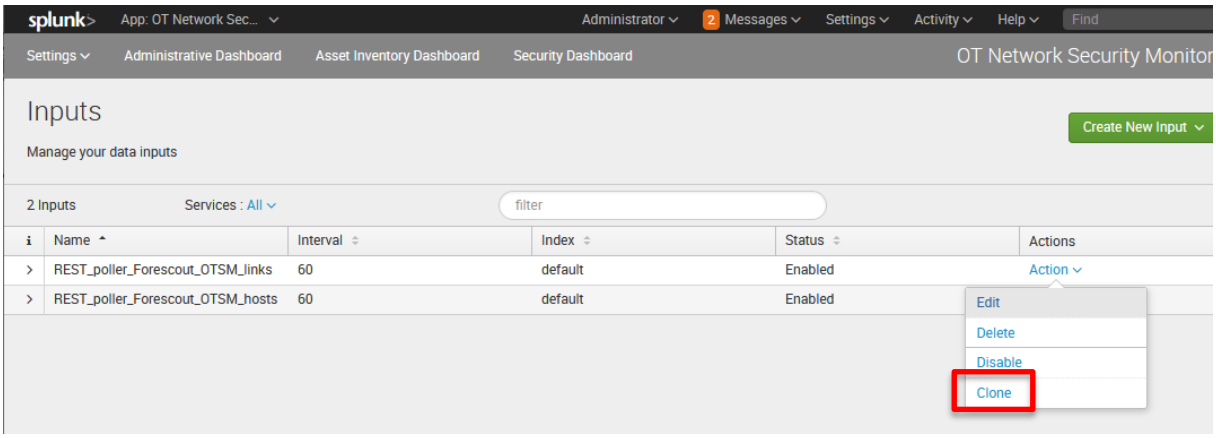
Enter the CC Server hostname/IP and click "Save."



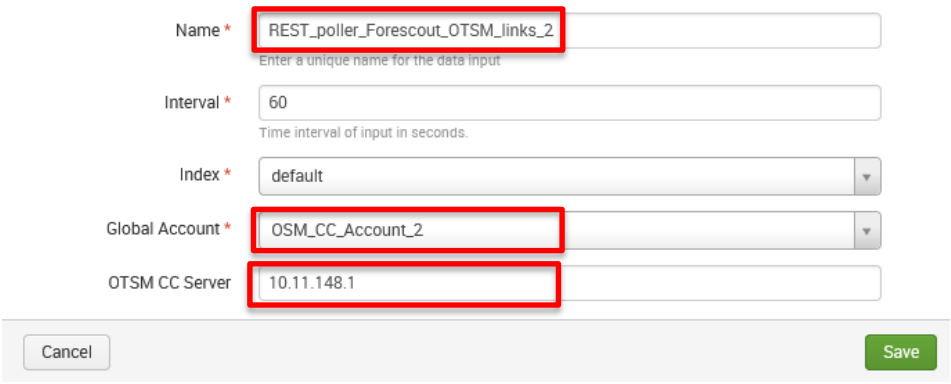
Repeat the last two steps for the "REST_poller_Forescout_OTSM_hosts" input.



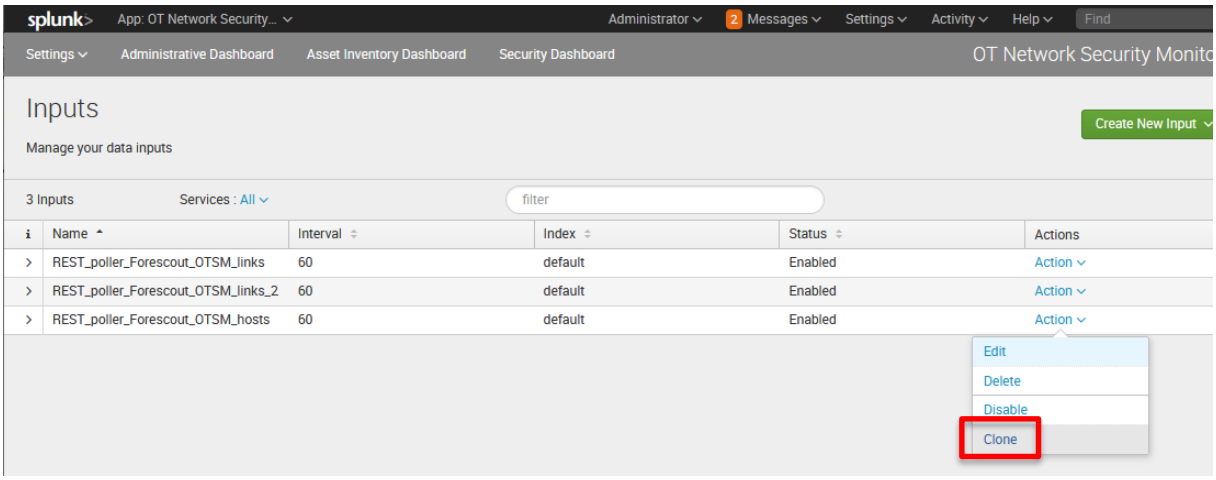
To connect to more than one Command Center, you will need to clone both inputs for each CC installation. In the input "REST_poller_Forescout_OTSM_links," click on the "Action" drop-down menu, then click on "Clone."



Enter a new Name for this input, select the Global account that contains the credentials for this CC and specify the hostname/IP.



Then, clone the "REST_poller_Forescout_OTSM_hosts" input and repeat the configuration process.



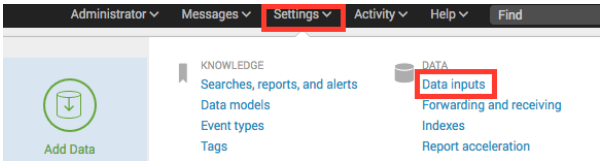
You will need to clone the "Hosts" and "Links" inputs for each Command Center installation.

So far, the Add-on should be able to fetch data via REST calls to the Command Center API. If you have existing data in the CC, you can check if this data is loaded by Splunk via searching for `forescout:OTSM:REST:hosts links` or `sensors` sourcetypes. See `inputs.conf`.

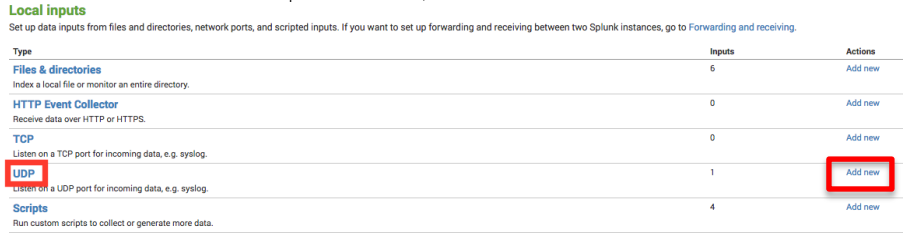
To open a communication with CC to forward its logs, an input port must be setup. OT Network Security Monitoring Alert Monitoring uses an input port to listen for incoming syslog messages and assign the `forescout:OTSM:logs:*event_type*` sourcetype based on transforms defined in *transforms.conf*.

You can setup an input port by performing the following steps. Setup for TCP and UDP input ports is virtually identical on Splunk's side. The only difference is in the Command Center forwarding settings, which are covered in later chapters. For this example, we have used port 5143 via UDP. This port can be any value and must be the same value the CC server uses with its log forwarders to send data. The procedure for setting up log forwarders in CC is defined in the next chapter.

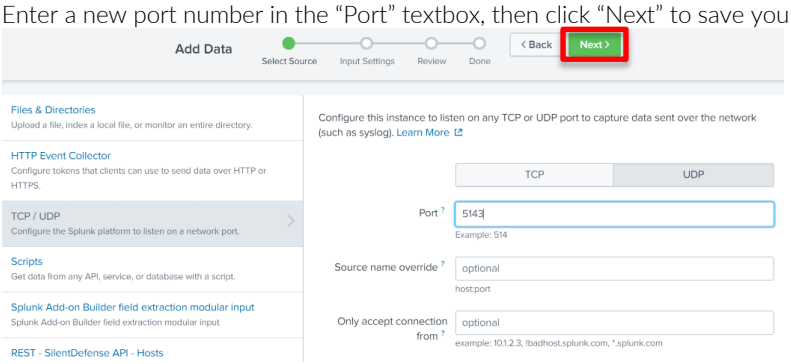
From Splunk's web interface, in the title bar menu, click "Settings" then "Data Inputs" to setup the input listener.



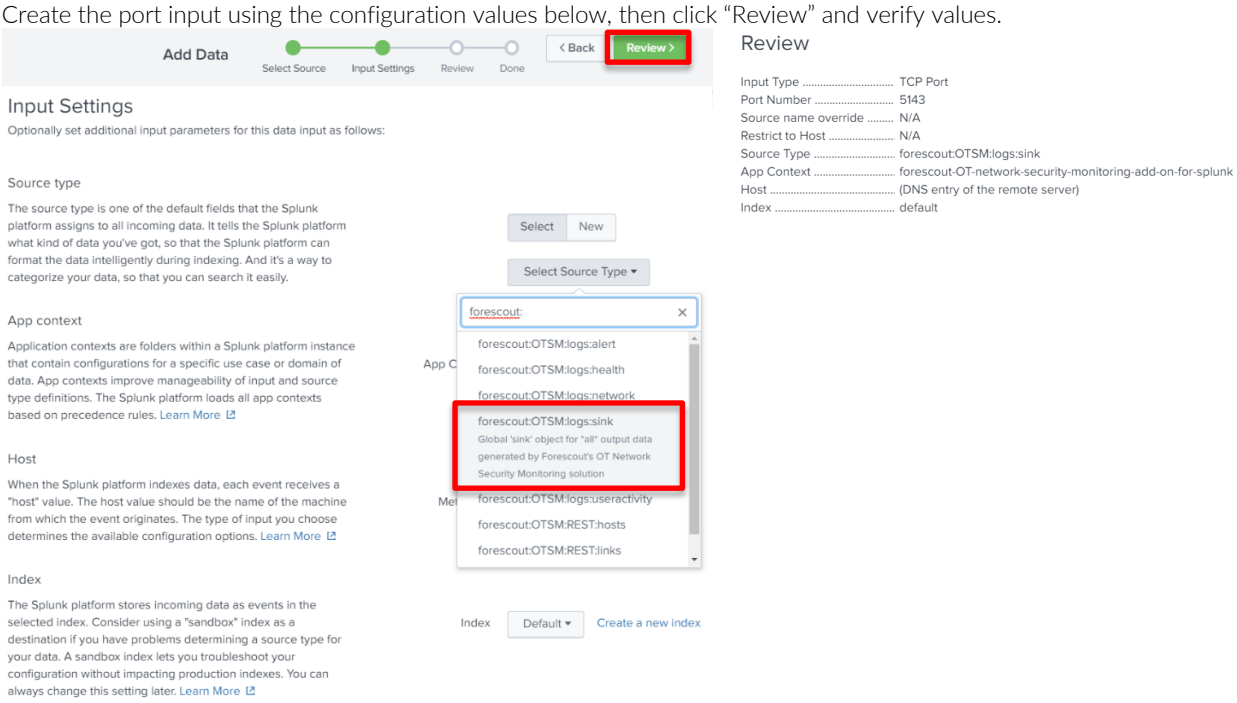
From “UDP” in the “Local inputs” section, click on “Add new” link.



Enter a new port number in the “Port” textbox, then click “Next” to save your changes.



Create the port input using the configuration values below, then click “Review” and verify values.



You are done configuring the Splunk Add-on! It should now have a working connection with the Command Center to gather host, link and sensor information via REST calls to CC. You can test this by replaying a PCAP on the machine (using tcpreplay, not to be confused with PCAP Sensor in CC) where you have a running Sensor instance (and that sensor is associated with a CC) and see some of the information generated in one of the three dashboards from the OT Network Security Monitoring Alert Monitoring add-on or search for the REST source types (i.e. `sourcetype="forescout:OTSM:REST:hosts"`).

To receive full information (alerts, network logs, etc.), CC needs to be setup to send these logs to Splunk, and this is detailed in the next chapter.

Important: The host information may change as eyeInspect analyzes more traffic in the network, thus, the add-on will continuously fetch more host data via the REST API. According to the interval specified in the data input configuration, the add-on fetches 1000 hosts per period. The hosts are fetched sequentially according to their ID number. When the last host is fetched by the add-on, the first 1000 hosts are fetched again in the next period, enabling Splunk to have the most recent host data. The dashboard and add-on queries will always show the recent host data, while the `forescout:OTSM:REST:hosts` source will also contain the old data.

Consider the impact of this continuous information logging on your Splunk instance and plan adequately the polling frequency and Splunk maintenance activities.

3. Configuring OT NSM Command Center Appliance

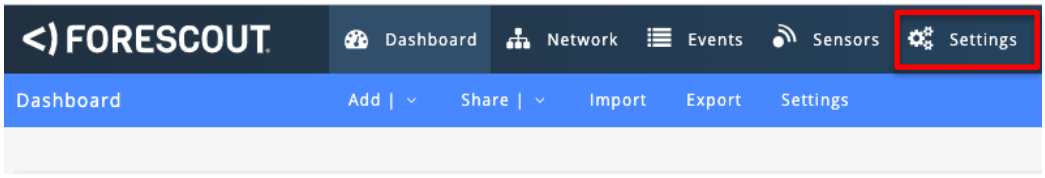
This information covers default log forwarding configuration for Splunk. Please refer to the Operational Guide for instructions on how to configure fields and/or other forwarding options of alerts, host and link information, and/or sensor health information.

To forward the logs from multiple Command Centers, you will need to repeat all the steps from this chapter (Configure Alert, Network Log, User Activity and Health Status Log Forwarding) in each CC installation.

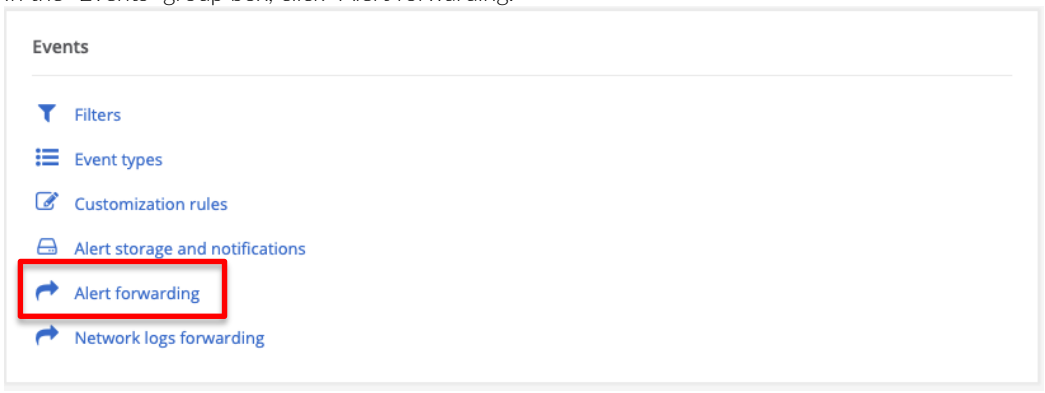
3.1. Alert Forwarding

NOTE: Before proceeding to setup alert forwarding, please ensure that there are *passive* sensors connected to CC. *Active* and *PCAP Replay* sensors do not generate these logs.

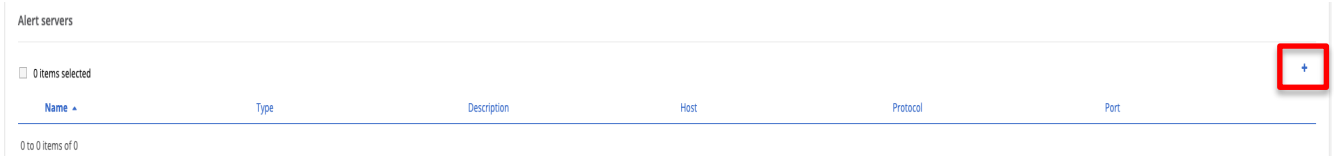
Click on "Settings" in Command Center's top bar menu.



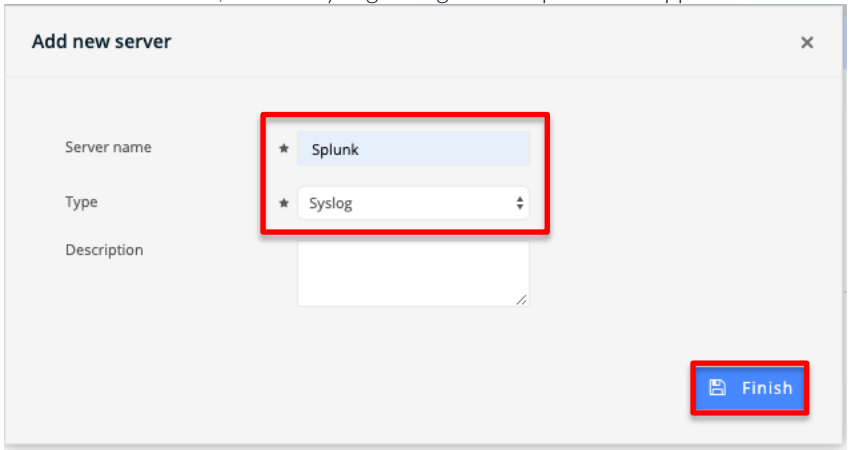
In the "Events" group box, click "Alert forwarding."



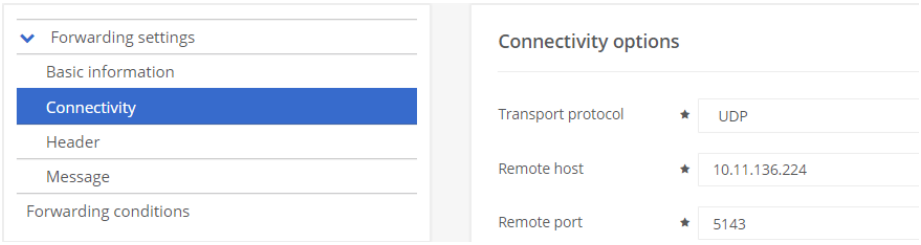
Click the "+" in the Alert Servers list to add a new server.



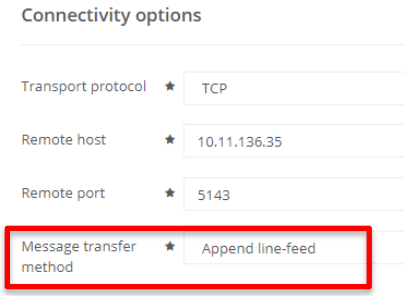
Enter a name for this forwarder/server, and leave "Syslog" as Type. Enter a description (optional). Click "Finish" to create the forwarder, and the syslog configuration options will appear.



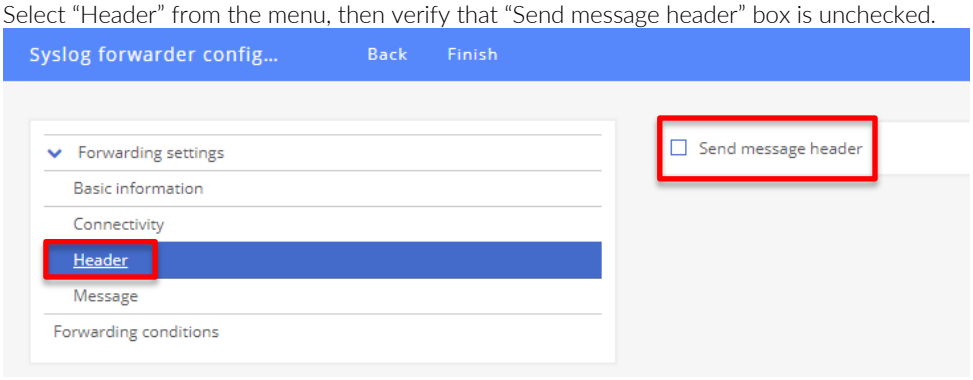
In the left side menu, select "Connectivity," and the "Connectivity options" group box will appear on the right. Select "UDP" under "Transport protocol," enter the IP address of your Splunk server and use 5143 for the port.



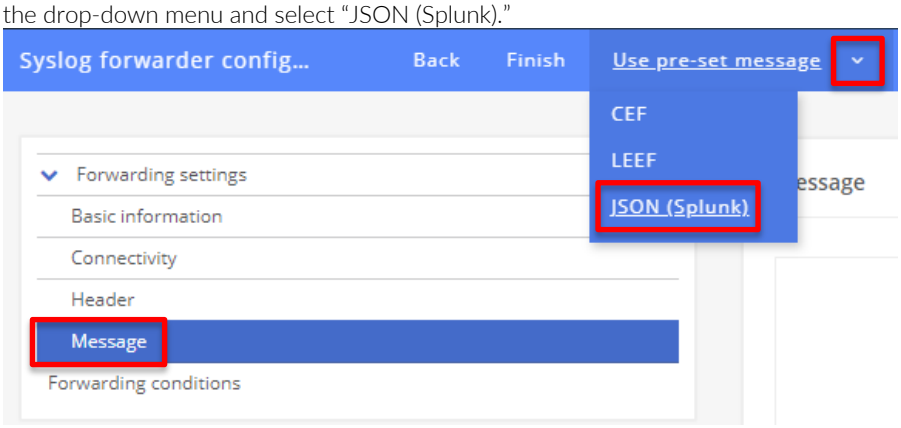
NOTE: If you are using TCP as the transport protocol, please ensure that "Append line-feed" option is selected from the "Message transfer method" drop-down.



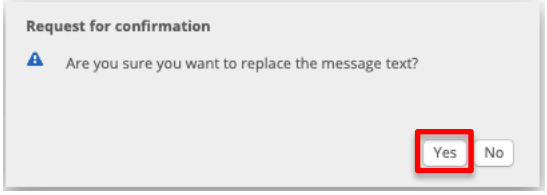
Select "Header" from the menu, then verify that "Send message header" box is unchecked.



Select "Message" from the menu, then click the arrow next to "User pre-set message" link on the title bar to open the drop-down menu and select "JSON (Splunk)."

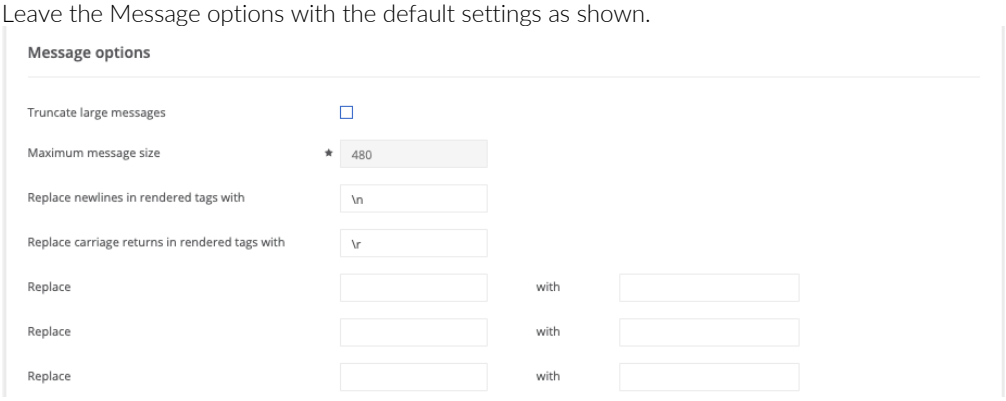


A dialog box will appear. Click "Yes" to replace the message.

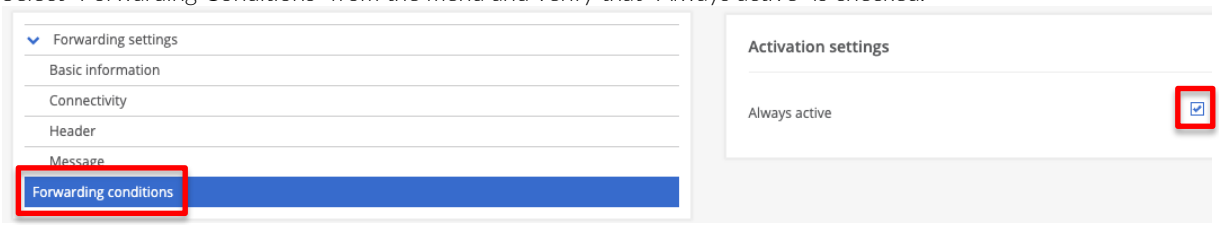


The following content will appear in the Message dialog box.

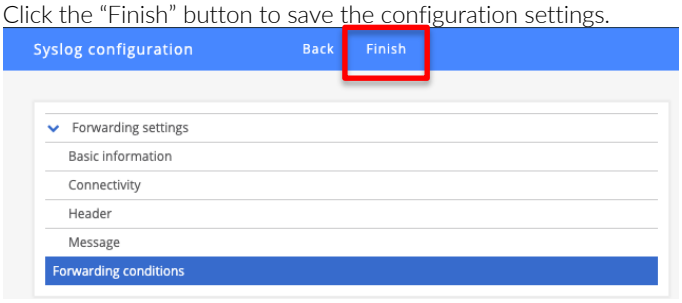
Leave the Message options with the default settings as shown.



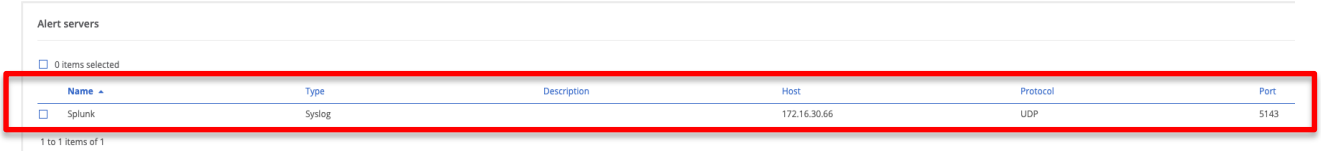
Select “Forwarding Conditions” from the menu and verify that “Always active” is checked.



Click the “Finish” button to save the configuration settings.



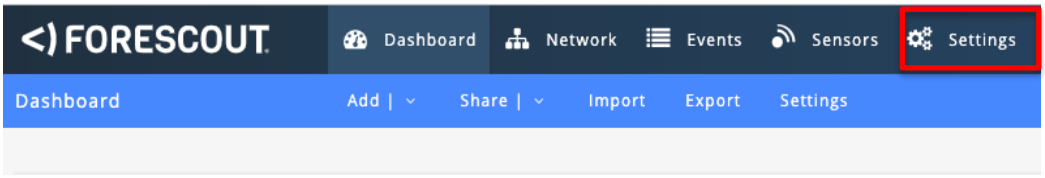
The server will now be listed under Alert Servers.



3.2. Network Log Forwarding

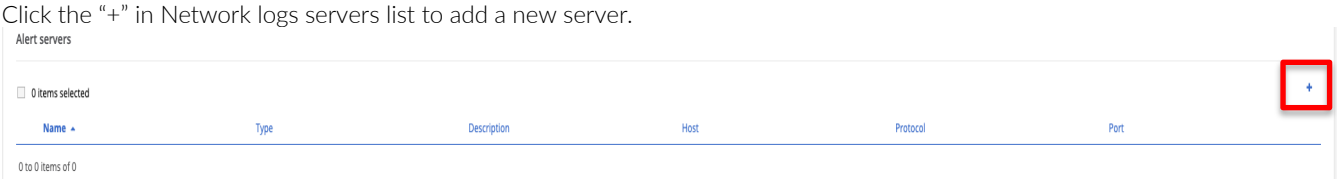
NOTE: Before proceeding to setup network log forwarding, please ensure that there are *passive* sensors connected to CC. *Active* and *PCAP Replay* sensors do not generate these logs.

Click on "Settings" in Command Center's top bar menu.

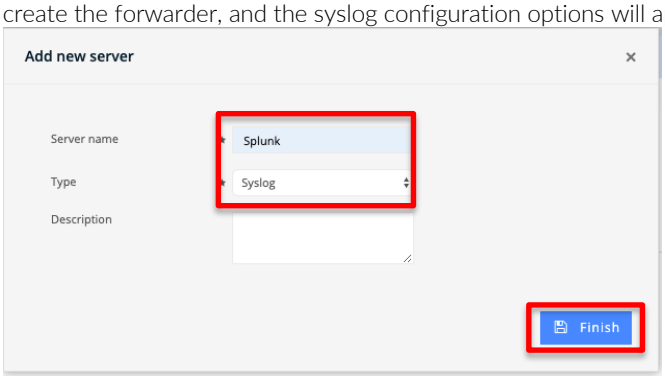


In the "Events" group box, click "Network logs forwarding."

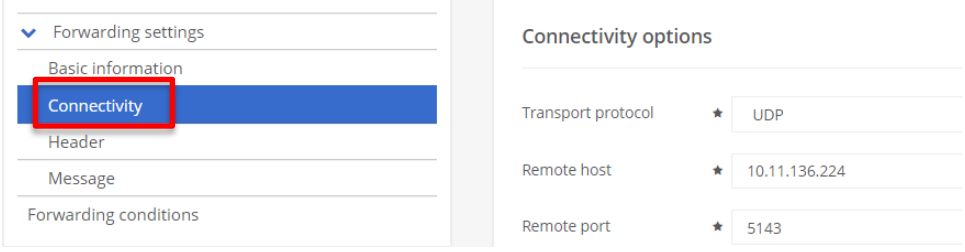
Click the "+" in Network logs servers list to add a new server.



Enter a name for this forwarder/server, and leave "Syslog" as Type. Enter a description (optional). Click "Finish" to create the forwarder, and the syslog configuration options will appear.



In the left side menu, select "Connectivity," and the "Connectivity options" group box will appear on the right. Select "UDP" under "Transport protocol," enter the IP address of your Splunk server and use 5143 for the port.



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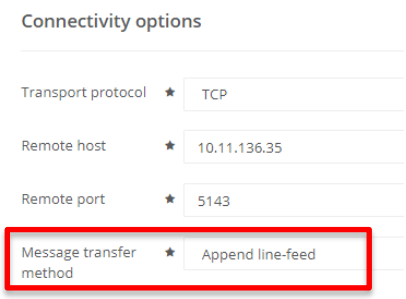
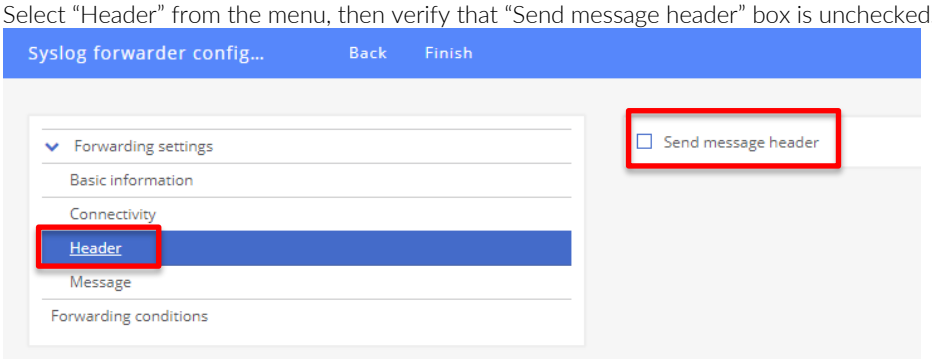


Select “Header” from the menu, then verify that “Send message header” box is unchecked.



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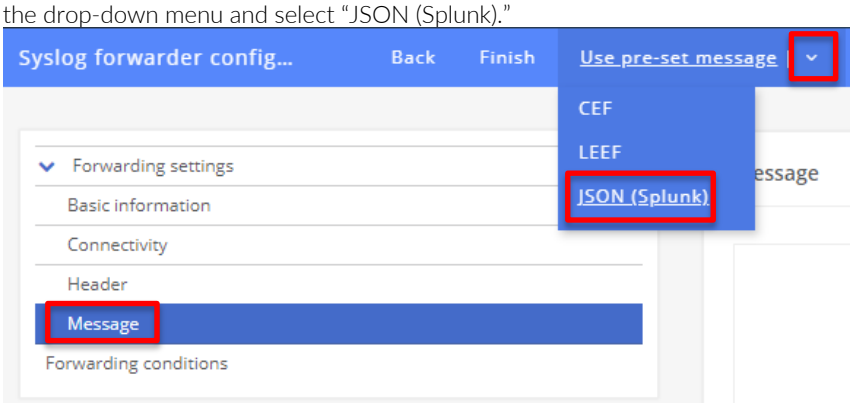
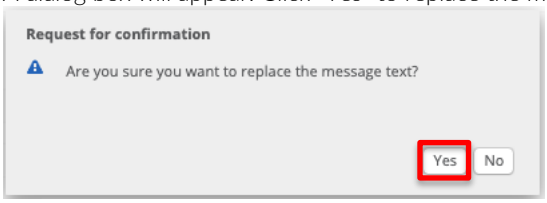
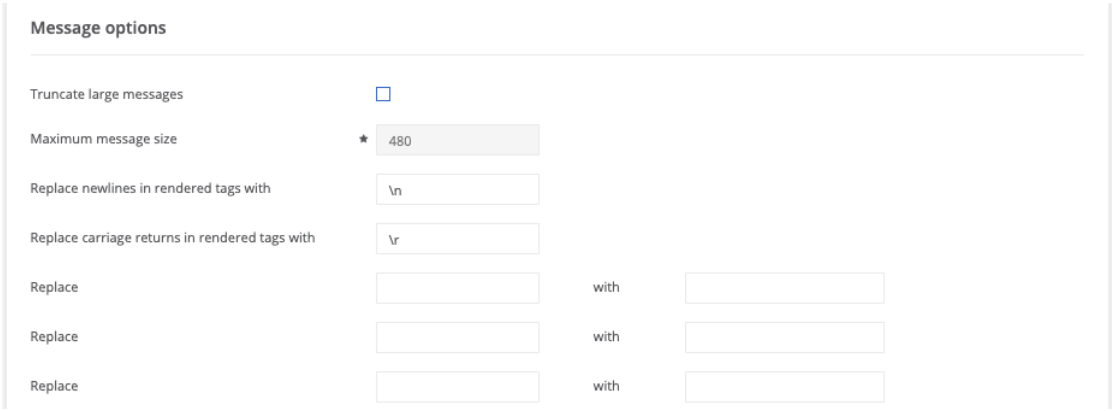


A dialog box will appear. Click “Yes” to replace the message.



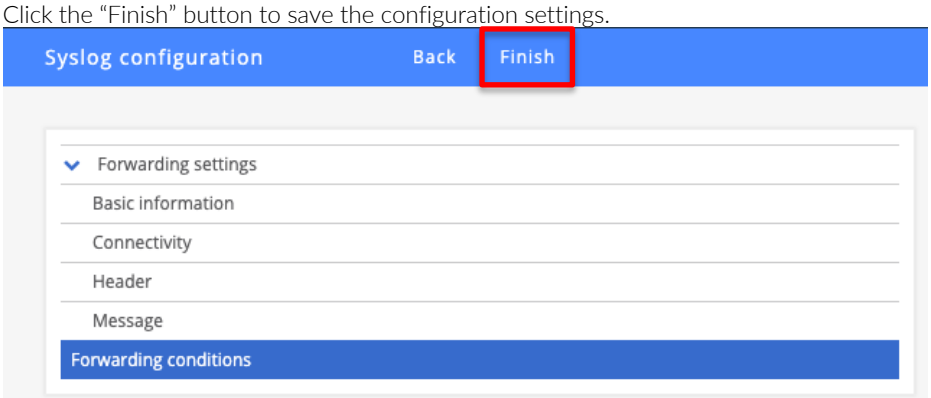
The following content will appear in the Message dialog box.

Leave the Message options with the default settings as shown.

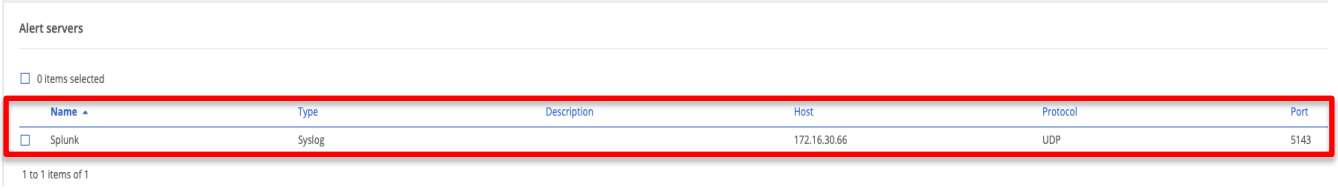


Select “Forwarding conditions” from the menu and verify that “Always active” is checked.

Click the “Finish” button to save the configuration settings.



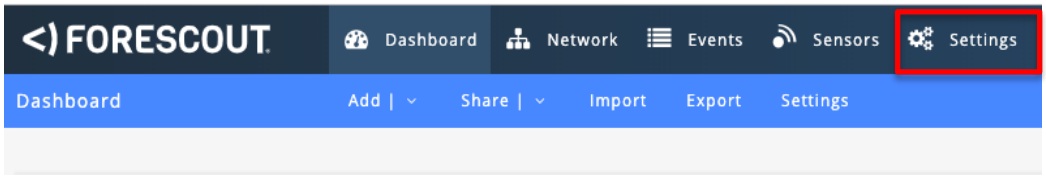
The server will now be listed under Network log servers.



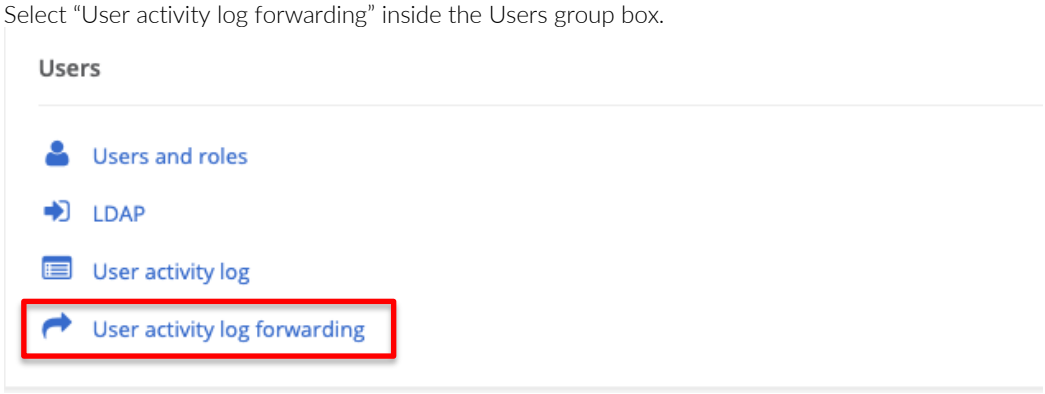
3.3. User Activity Log Forwarding

NOTE: Before proceeding to setup user activity log forwarding, please ensure that there are *passive* sensors connected to CC. *Active* and *PCAP Replay* sensors do not generate these logs.

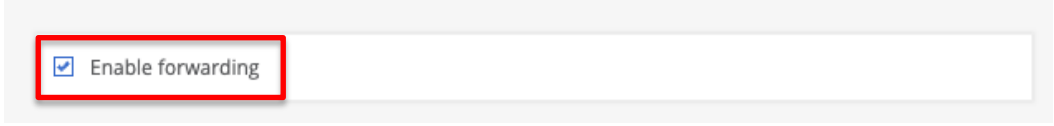
Go to Settings on the main menu bar in the Command Center.



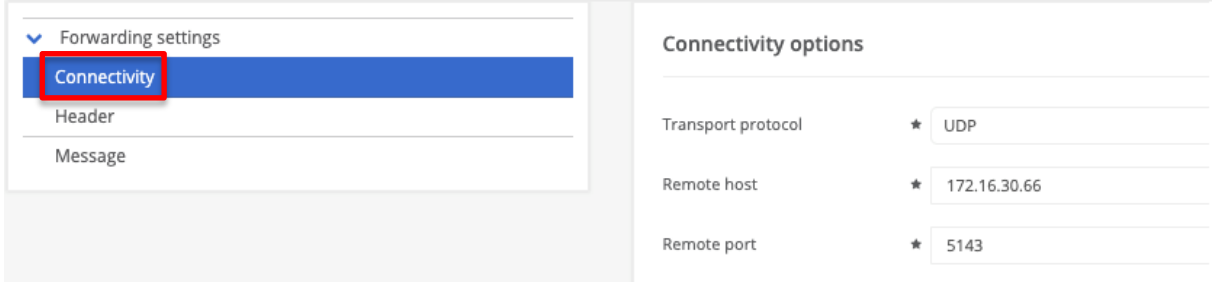
Select "User activity log forwarding" inside the Users group box.



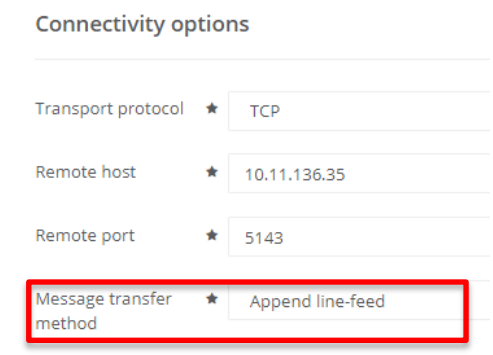
Verify that "Enable forwarding" is checked.



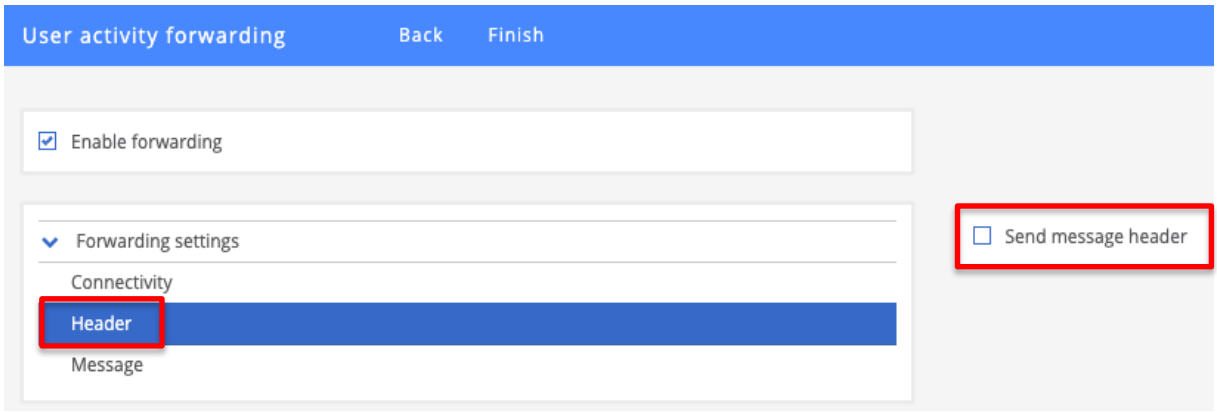
In the left side menu, select "Connectivity," and the "Connectivity options" group box will appear on the right. Select "UDP" under "Transport protocol," enter the IP address of your Splunk server and use 5143 for the port.



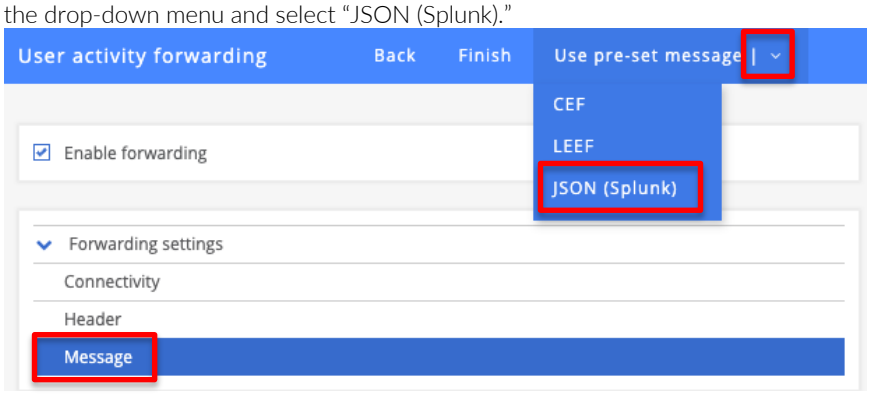
NOTE: If you are using TCP as the transport protocol, please ensure that "Append line-feed" option is selected from the "Message transfer method" drop-down.



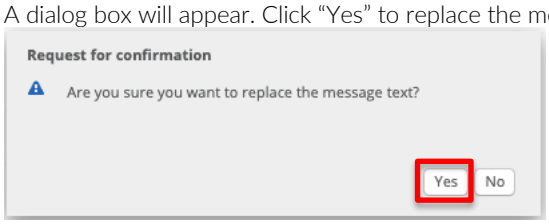
Select "Header" from the menu, then verify that "Send message header" is unchecked.



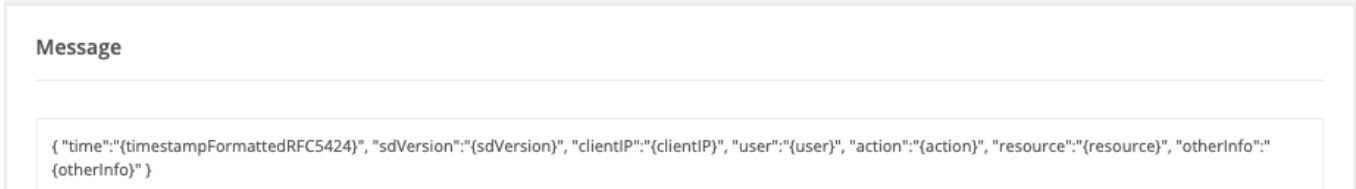
Select “Message” from the menu, then click the arrow next to “User pre-set message” link on the title bar to open the drop-down menu and select “JSON (Splunk).”



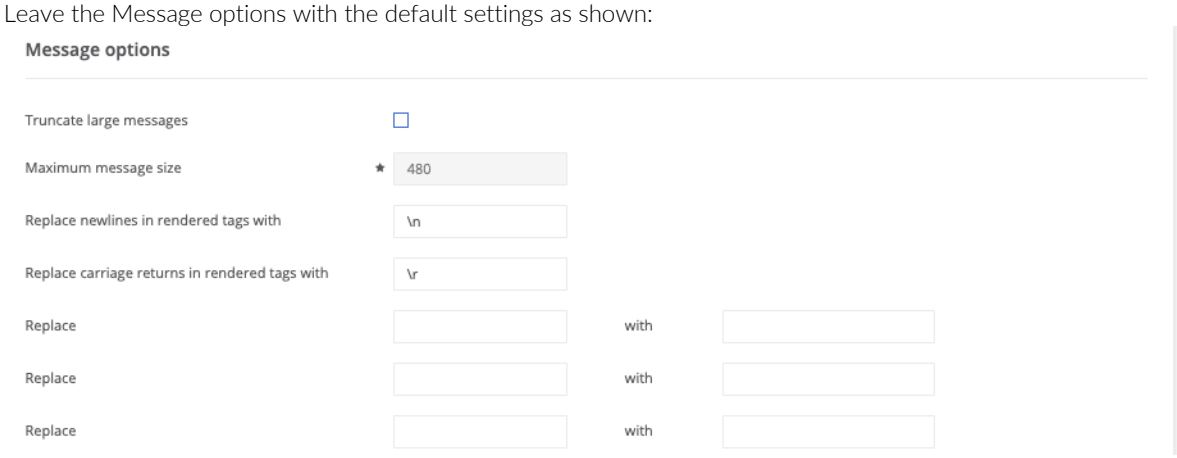
A dialog box will appear. Click “Yes” to replace the message.



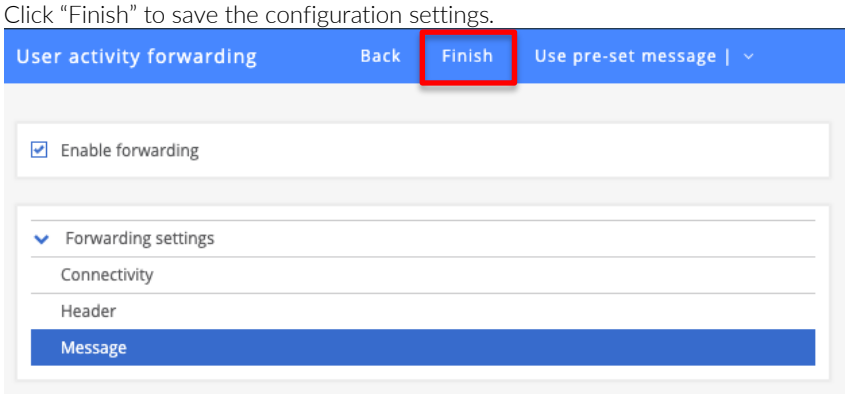
The following content will appear in the Message dialog box.



Leave the Message options with the default settings as shown:



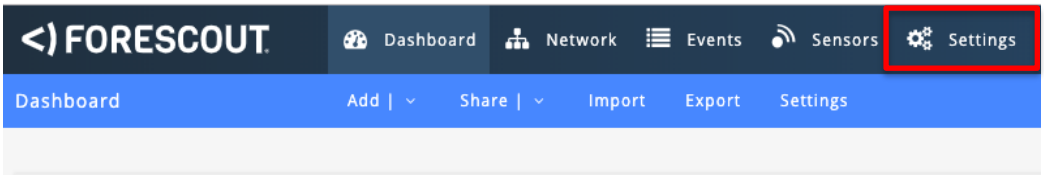
Click “Finish” to save the configuration settings.



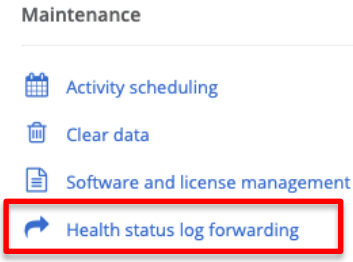
3.4. Health Status Log Forwarding

NOTE: Before proceeding to setup health status log forwarding, please ensure that there are *passive* sensors connected to CC. *Active* and *PCAP Replay* sensors do not generate these logs.

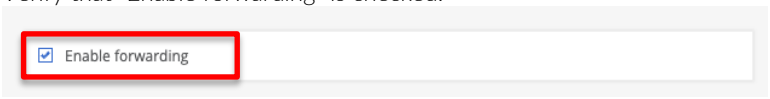
Go to Settings on the main menu bar in the Command Center.



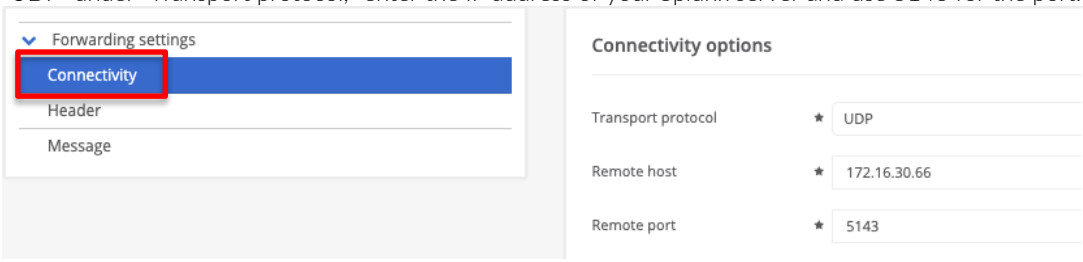
Under the Maintenance box, select "Health status log forwarding."



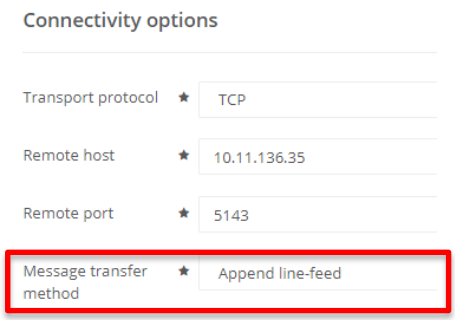
Verify that "Enable forwarding" is checked.



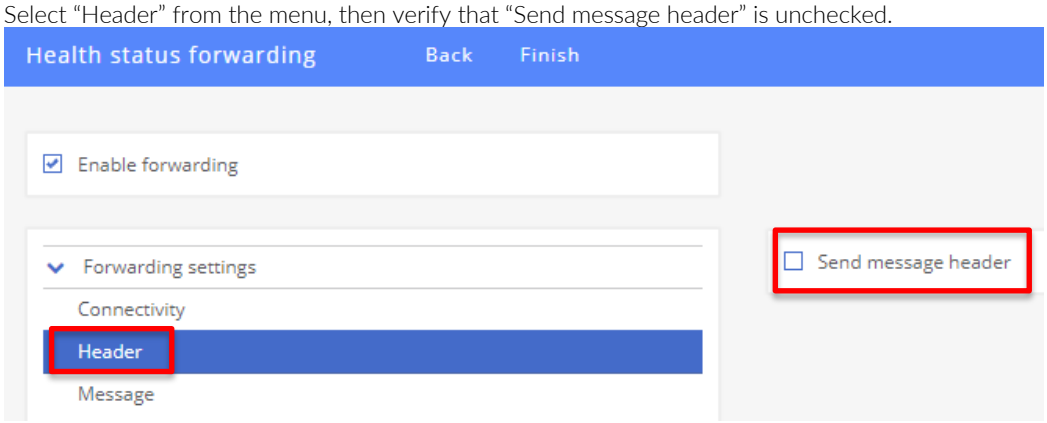
In the left side menu, select "Connectivity," and the "Connectivity options" group box will appear on the right. Select "UDP" under "Transport protocol," enter the IP address of your Splunk server and use 5143 for the port.



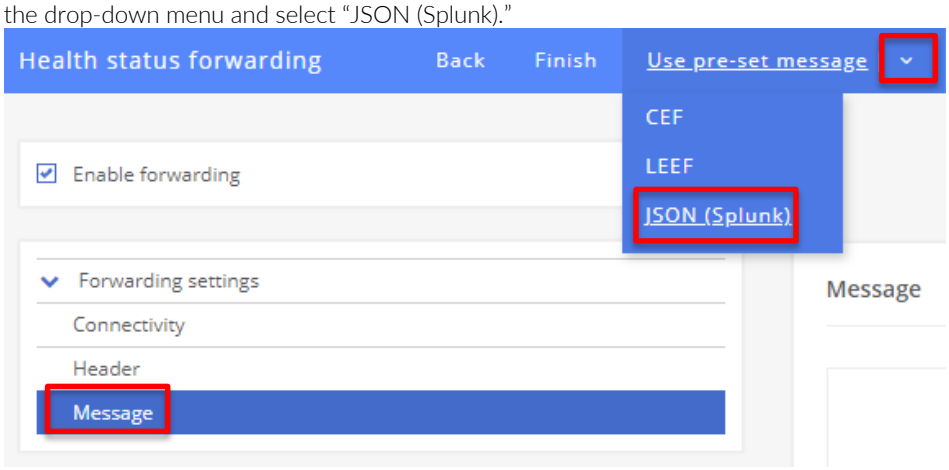
NOTE: If you are using TCP as the transport protocol, please ensure that the "Append line-feed" option is selected from the "Message transfer method" drop-down.



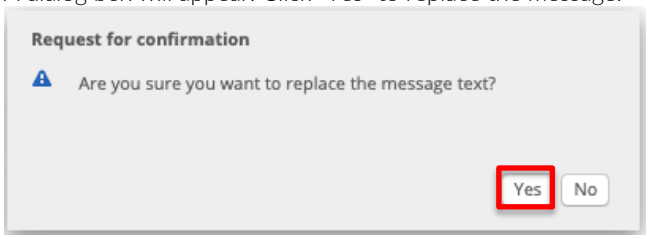
Select “Header” from the menu, then verify that “Send message header” is unchecked.



Select “Message” from the menu, then click the arrow next to “User pre-set message” link on the title bar to open the drop-down menu and select “JSON (Splunk).”

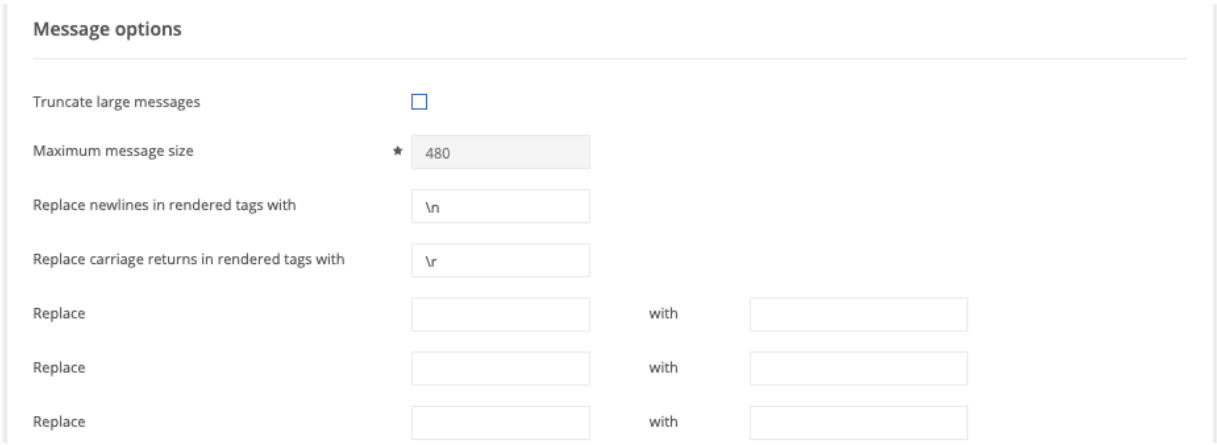


A dialog box will appear. Click “Yes” to replace the message.

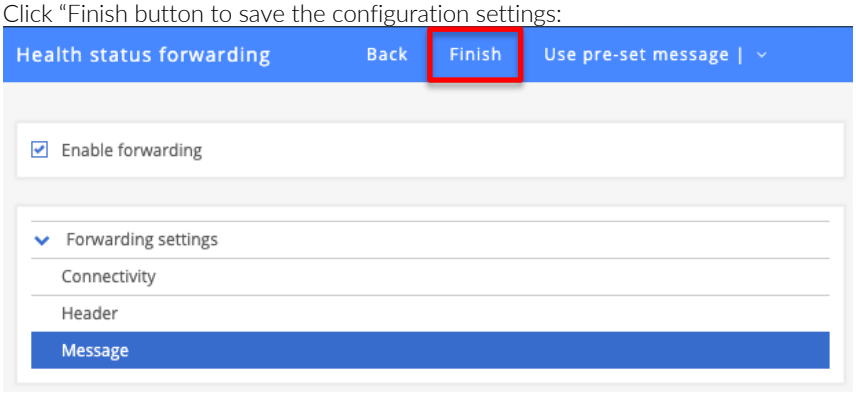


The following content will appear in the Message dialog box.

Leave the Message options with the default settings as shown.



Click “Finish button to save the configuration settings:



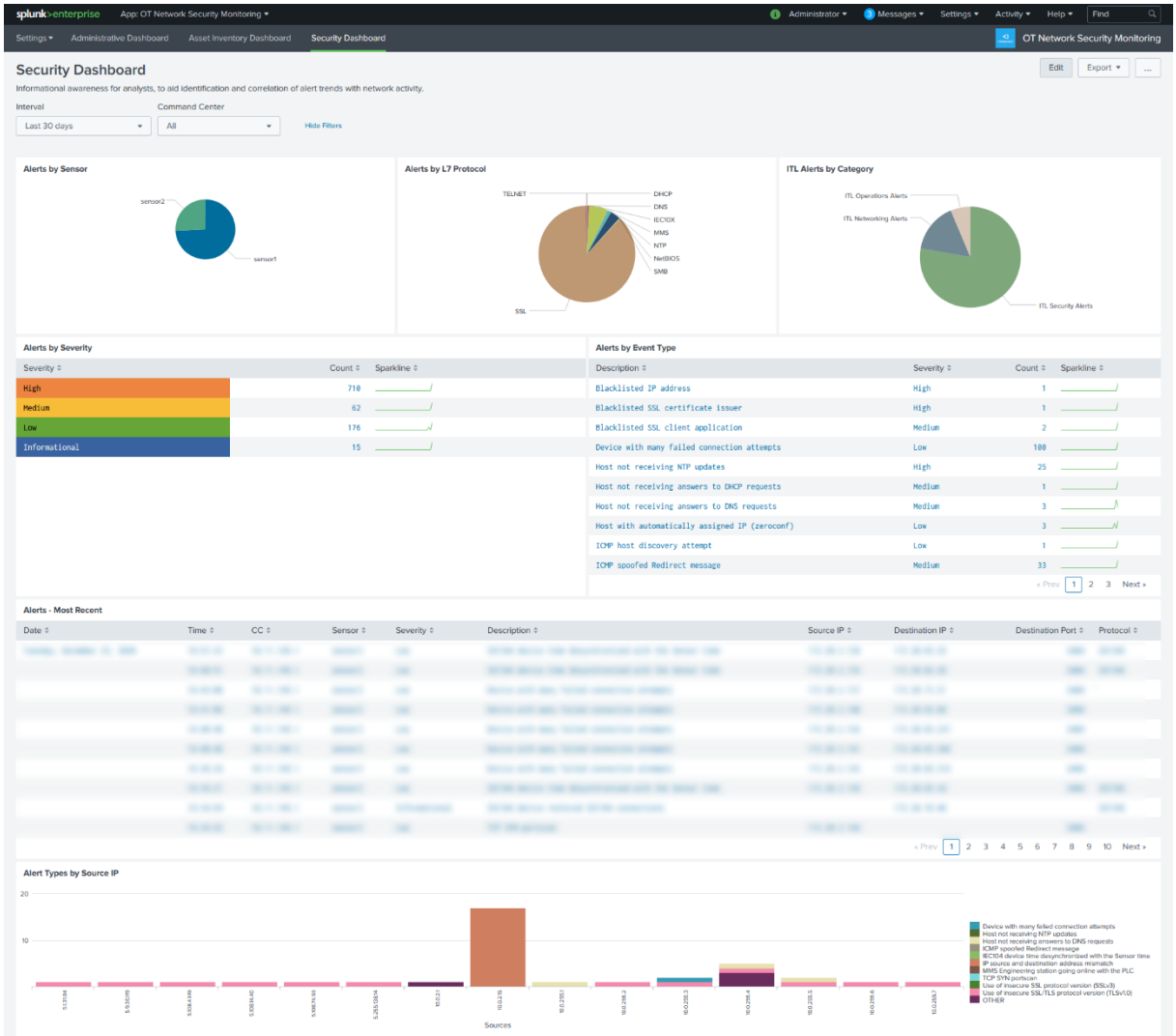
4. OT Network Security Monitoring Add-on Dashboards

The OT Network Security Monitoring dashboard app is a powerful tool that lets you visualize and identify trends within your monitored network. The dashboards allow you to drill down and analyze all the information sent by the OT Network Security Monitoring CC server. Each dashboard includes pre-configured widgets and panels to present information as described in the following pages, plus an interval time picker that can be used to modify the interval of interest on all the widgets, and a Command Center picker that allows you to visualize the information merged from all the CCs or from a single CC.

The App provides the following dashboards:

- Security Dashboard
- Asset Inventory Dashboard
- Administrative Dashboard

4.1. Security Dashboard



The Security Dashboard options and widgets

Interval Time Picker

[Drop-down menu] The shared time picker is used to control the time interval for *all* the widgets on the dashboard.

Command Center Picker

[Drop-down menu] Used to control from which CC the information on *all* dashboard's widgets is shown.

Alerts by Sensor Name
[Pie chart] Displays which sensor[s] have sent alerts. The displayed fields are Sensor Name and Count.

Alerts by L7 Protocol
[Pie chart] Displays which Layer 7 protocols have generated alerts. The displayed fields are Layer 7 Protocol and Count.

ITL Alerts by Category
[Pie chart] Displays the alerts generated by the OT Network Security Monitoring Industrial Threat Library (ITL) module. The ITL is split into three categories: Operations, Security and Networking. The displayed fields are ITL Category and Count.

Alerts by Severity
[Sparkline] Displays the number of alerts of each severity. OT Network Security Monitoring categorizes alerts as Informational, Low, Medium, High and Critical. The displayed fields are Severity, Count and Sparkline.

Alerts by Event Type
[Sparkline] Displays the number of alerts of each event type. The event types are provided by the OT Network Security Monitoring appliance. The displayed fields are Description, Severity, Count and Sparkline.

Recent OT Network Security Monitoring Alerts
[Table] Displays information about the most recent alerts that have been generated by OT Network Security Monitoring. The widget is sorted by time, with the most recent first, by default. The displayed fields are Time, CC, Sensor, Severity, Description, Source IP, Destination IP, Destination Port and Layer 7 Protocol.

Alert Types by Source IP
[Bar Chart] Displays the number of alerts associated with each source IP address. It is a stacked bar chart, and the colors within the bar correspond to the event type of the alerts. By default, only the 15 source IP addresses with the most alerts are included in the widget. The displayed fields are Source IP, Count and Event Type.

Alert Types by IP
[Bar Chart] Displays the number of alerts associated with each IP address (source and/or destination). It is a stacked bar chart, and the colors within the bar correspond to the event type of the alerts. By default, only the 15 IP addresses with the most alerts are included in the widget. The displayed fields are IP Address, Count and Event Type.

Alerts by Sensor Name by Protocol
[Bar Chart] Displays the number of alerts by each sensor. It is a stacked bar chart, and the colors within the bar correspond to the Layer 7 Protocol of the alerts. The displayed fields are Sensor Name, Count and L7 Protocol.

ITL Alerts (24h/1h)
[Count with Trend] Displays the count of ITL alerts by category in the previous 24 hours. It also has a trending arrow that shows whether the count has been increasing, decreasing or the same over the previous one hour. This widget does not use the shared time picker. The displayed fields are ITL Category and Count.

DNS Queries – Top 15
[Bar Chart] Displays the 15 most common DNS hostnames that have been queried. The displayed fields are DNS Query, Source IP, Destination IP and Count.

DNS Queries – Fewest 10
[Table] Displays the 10 least common DNS Queries seen on the network. The displayed fields are DNS Query and Count.

Resolved DNS Queries – Top 10
[Table] Displays the 10 DNS queries that have been resolved the most times. The displayed fields are Query/Response and Count.

Resolved DNS Queries – Fewest 10
[Table] Displays the 10 DNS queries that have been resolved the fewest times. The displayed fields are Query/Response and Count.

Authentication Success

[Bar Chart] Displays successful authentication attempts over cleartext protocols. It shows both the protocol and the username used for the authentication. The displayed fields are Date, Username, L7 Protocol and Count.

Authentication Failures

[Table] Displays authentication failures and the reason for the failure. The displayed fields are Time, Protocol, User, Authentication Error, Source IP and Destination IP.

Authentication Details

[Table] Displays both successful and failed authentication attempts that used cleartext protocols. The displayed fields are Time, CC, Source IP, Destination IP, Username, Protocol and Event (Success or Failure).

SSL Certificates Requested

[Table] Identifies SSL certificates used on the network. The displayed fields are Issuer, Validity, Expiration, Cipher Suite used, Source IP and Destination IP.

File Activity

[Table] Records the file activity happening on the network, such as file reads, writes or deletes. The displayed fields are Time, Source IP, Destination IP, Username, File Activity (delete, create, modify, etc.) and Filename.

4.2. Asset Inventory Dashboard

The Asset Inventory Dashboard options and widgets

Interval Time Picker
[Drop-down menu] The shared time picker is used to control the time interval for the widgets on the dashboard.

Command Center Picker
[Drop-down menu] Used to control from which CC the information on *all* dashboard's widgets is shown.

Assets – Added to Inventory
[Table] Displays assets that have been identified on the network. This widget does not utilize the shared time picker. The displayed fields are Time in Past, CC, IP, Mac Address(es), Vendor/Model, Firmware, Hardware, Serial, Labels, OS Version and First Seen.

Assets with Modules – Added to Inventory
[Table] Displays assets that have been identified on the network that have modules. This widget does not utilize the shared time picker. The displayed fields are Time in Past, CC, IP, MAC Address(es), Vendor/Model, Firmware, Hardware, First Seen and Modules.

Failed Connections
[Table] Displays failed connections seen within the network as reported by OT Network Security Monitoring. The displayed fields are Time, CC, Ports, Sensor, Source IP, Destination IP, Protocol and First Seen.

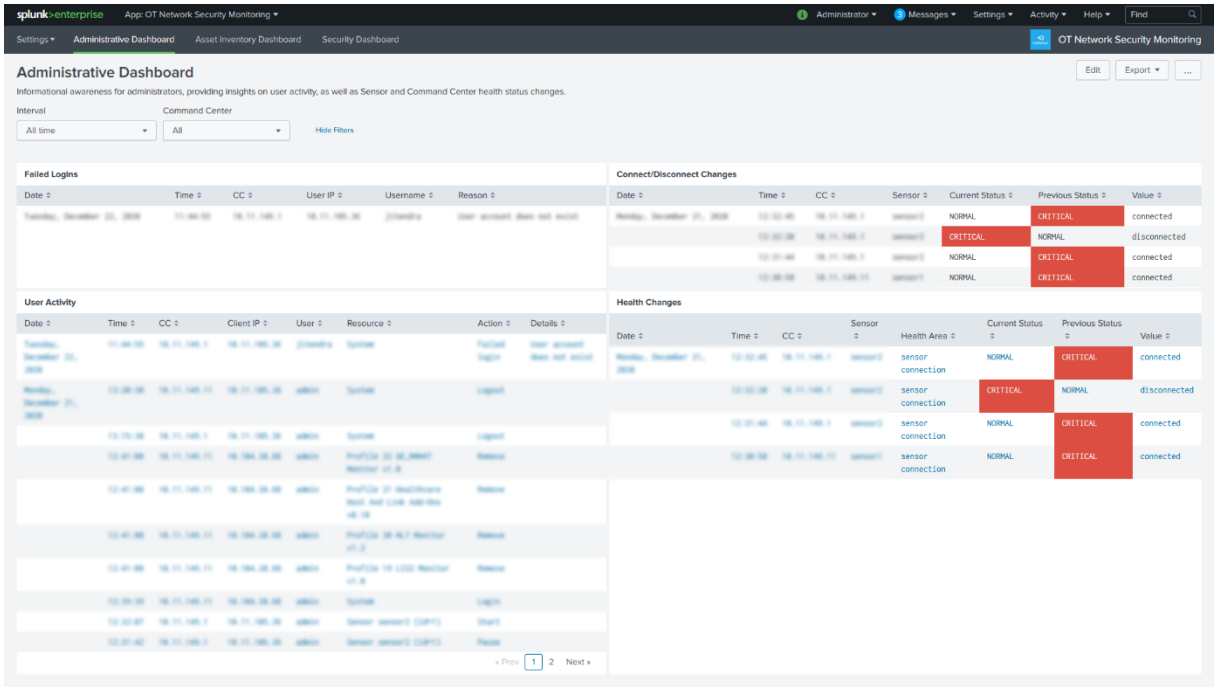
TELNET Protocol Used
[Table] Displays assets that have used the TELNET protocol. The displayed fields are Time, CC, Sensor, Source IP, Destination IP and First Seen.

DHCP Protocol Used
[Table] Displays assets that have used the DHCP Protocol. The displayed fields are Time, CC, Sensor, Source IP, Destination IP and First Seen.

Ghost Nodes
[Table] Displays ghost nodes (i.e., nodes receiving network packets or requests, but never responding) seen on the network. Ghost nodes are classified by OT Network Security Monitoring. The displayed fields are CC, IP Address, First Seen and Last Seen.

Links – Last Seen 20
[Table] Displays the last 20 communication links seen on the network.
The displayed fields are CC, Source IP, Destination IP, Sensor, Protocol and Last Seen.

4.3. Administrative Dashboard



The Administrative Dashboard options and widgets

Interval Time Picker

[Drop-down menu] The shared time picker is used to control the time interval for *all* the widgets on the dashboard.

Command Center Picker

[Drop-down menu] Used to control from which CC the information on *all* dashboard's widgets is shown.

Failed Logins

[Table] Displays a list of failed OT Network Security Monitoring login attempts and the reason for the failure. The displayed fields are Time, CC, User IP, Username and Reason.

Health Changes

[Table] Displays a list of health changes for Command Center and Sensors. For example, it displays when sensors are at a critical memory usage level and when sensors connect or disconnect with a Command Center. The displayed fields are Time, CC, Sensor, Health Area, Current Status, Previous Status and Current Value.

User Activity

[Table] Shows activity being performed on OT Network Security Monitoring, such as when a user logs in or makes changes to sensor modules or profiles. The displayed fields are Time, CC, Client IP, User, Resource, Action and Details.

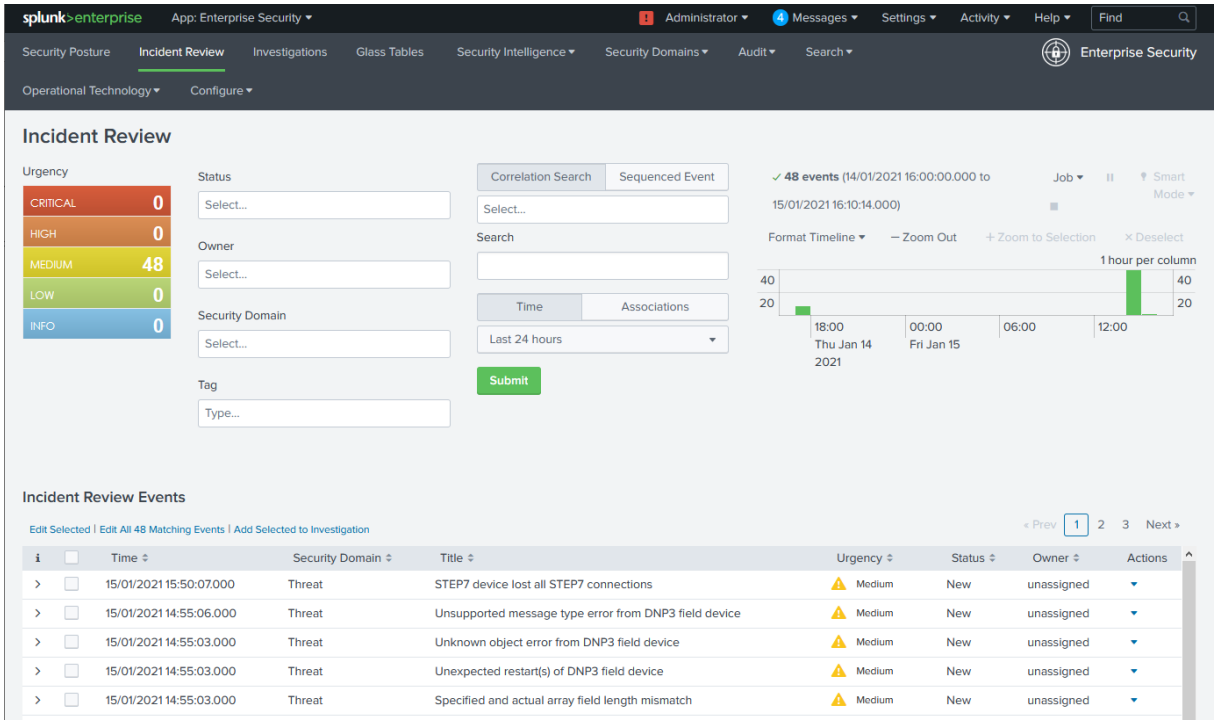
Connect/Disconnect Changes

[Table] Logs when Active Sensors connect or disconnect from a Command Center. The displayed fields are Time, CC, Sensor, Health Area, Current Status, Previous Status and Current Value.

5. OT Network Security Monitoring CIM integration

The Forescout OT Network Security Monitoring Add-on supports integration with the Splunk Common Information Model. The events collected by the OT-NSM Add-on are mapped to the preconfigured data models and can be visualized in compatible add-ons.

The OT Security Add-on for Splunk version 1.0.3 or higher is validated as compatible with the Forescout OT-NSM Add-on. Refer to the OT Security Add-on documentation, available on Splunk Docs for more information on how to configure the add-on and the integration.



The OT Security Add-on for Splunk - Incidents Review Dashboard

6. OT NSM Add-on Compatibility

Compatibility with Splunk

The OT NSM Add-on is compatible with the following Splunk versions: 8.0

Compatibility with CIM

The OT NSM Add-on is compatible with the following Splunk Common Information Model versions: 4.x

Compatibility with Platforms

The OT NSM Add-on is compatible with the following platforms: Windows, Linux.