

Cisco Catalyst SD-WAN Splunk Integration

User guide



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Introduction

Cisco SD-WAN and ZBFW

A software-defined wide area network (SD-WAN) is a virtualized service that connects and extends enterprise networks over large geographical distances. Cisco SD-WAN provides unparalleled visibility across WAN, optimal connectivity for end users, and the most comprehensive security platform to harden the network. The Cisco Zone-Based Firewall is the successor of the Classic IOS firewall or CBAC (Context-Based Access Control). It primarily deals with the security “zones”. We can assign router interfaces to various security zones and control the traffic between them. The firewall dynamically inspects traffic passing through zones.

Cisco SD-WAN Splunk Integration

Cisco SD-WAN Splunk Integration will have 2 components:

- Cisco SD-WAN Add-on for Splunk
- Cisco SD-WAN App for Splunk

Cisco SD-WAN Add-on for Splunk

Add-ons are used for data optimization and collection processes. Cisco SD-WAN Add-on for Splunk collects different types of Cisco logs Data and Netflow Data and stores them into Splunk indexes.

Cisco SD-WAN App for Splunk

The Cisco SD-WAN App will present dashboards for different types of Cisco Logs and NetFlow Data. The app is used for visualization, analysis, and representation. The dashboard will use the data collected by the Add-on.

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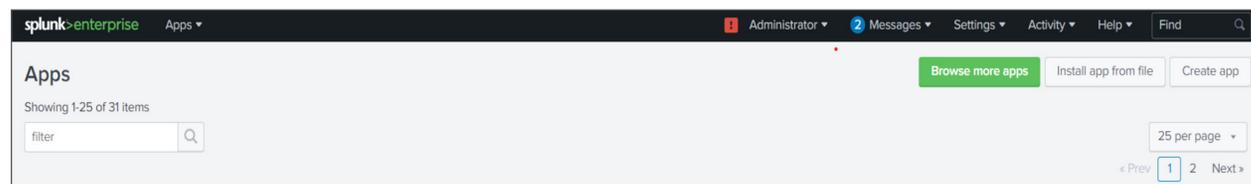
Pre-Requisites

- Install Splunk App for Stream and Splunk Add-on for Stream Forwarders in the Splunk instance to collect the NetFlow (v9) data.
- Make sure that the receiver UDP port (Ex. 4739) is open and bypass the firewall traffic.

Installation and configuration of Cisco SD-WAN

The Add-on and App can be installed in two different ways:

- Through the Splunk user interface from **Apps > Manage Apps > Install the app from file**. Upload the downloaded file.



- By extracting the compressed file (<-xx-x.x.x-x.tar.gz) into the \$SPLUNK_HOME\$/etc/apps folder.

Install app from file

If you have a .spl or .tar.gz app file to install, you can upload it using this form.
You can replace an existing app via the Splunk CLI. [Learn more](#).

File

cisco-sdwan-app.zip

Upgrade app. Checking this will overwrite the app if it already exists.

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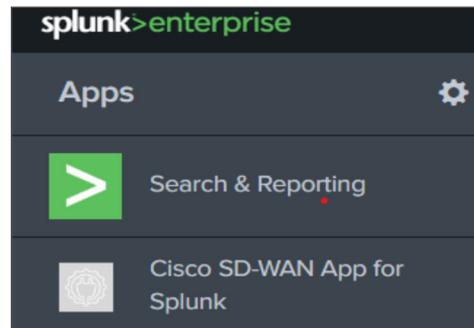
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- **Note:** Splunk restart is required after App and Add-on installation.



- Once you log in under Splunk, click on **Cisco SD-WAN App For Splunk** on the left side of the screen.



Add-on configuration

Configure Inputs on Splunk for Syslog Data:

The “Cisco SD-WAN Add-on for Splunk” manages inputs through TCP/UDP inputs provided by Splunk. To configure inputs:

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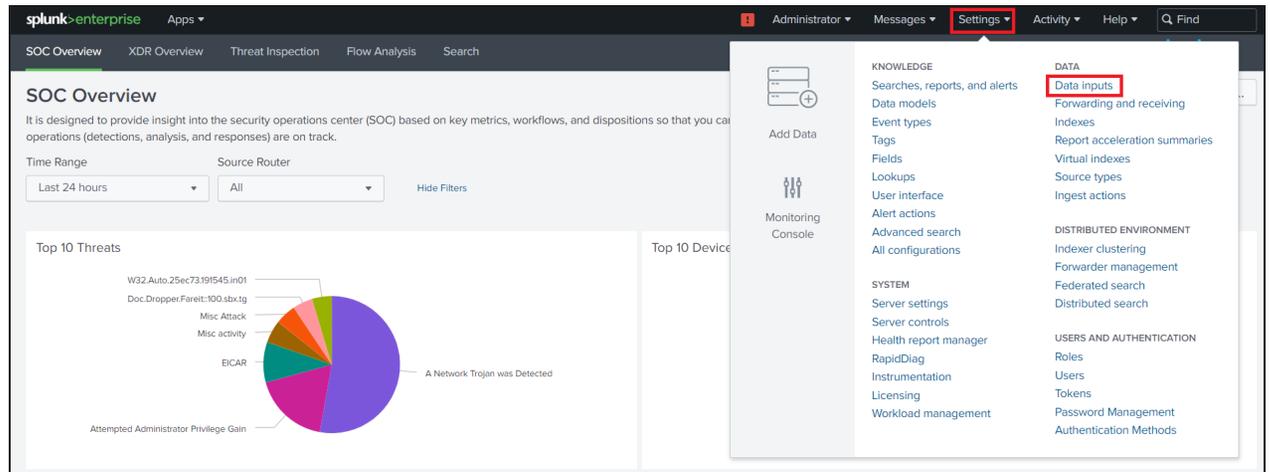
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1. Login to Splunk WEB UI.



2. Navigate to Settings > Data inputs.



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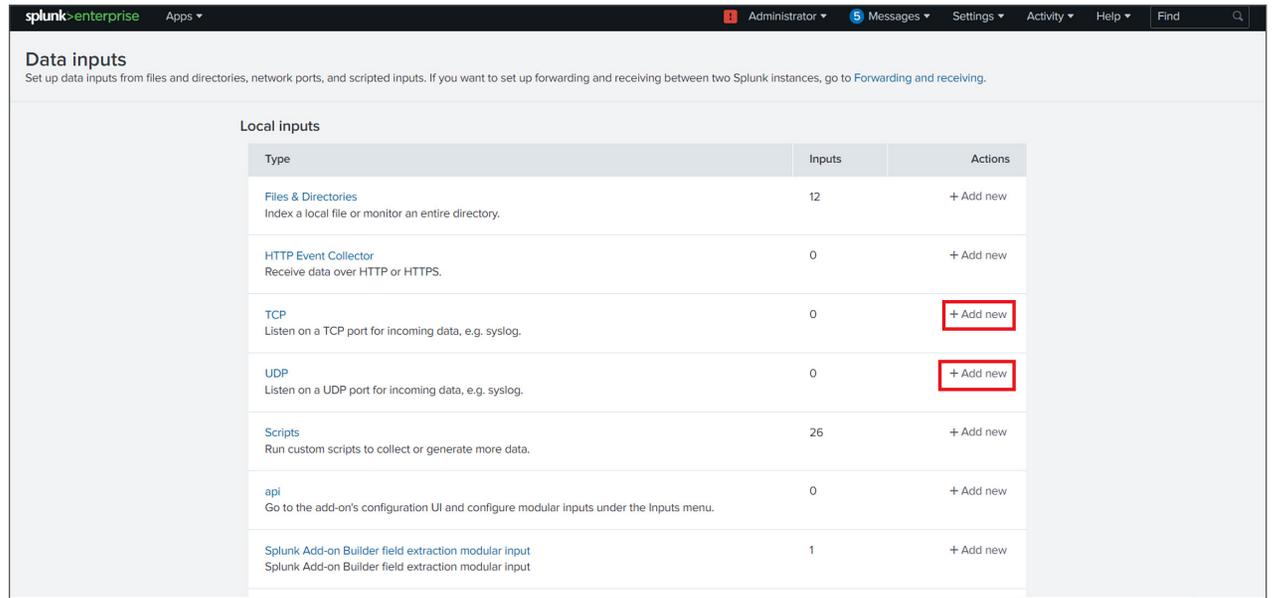
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3. Choose TCP or UDP and click New.



Data inputs
Set up data inputs from files and directories, network ports, and scripted inputs. If you want to set up forwarding and receiving between two Splunk instances, go to [Forwarding and receiving](#).

Type	Inputs	Actions
Files & Directories Index a local file or monitor an entire directory.	12	+ Add new
HTTP Event Collector Receive data over HTTP or HTTPS.	0	+ Add new
TCP Listen on a TCP port for incoming data, e.g. syslog.	0	+ Add new
UDP Listen on a UDP port for incoming data, e.g. syslog.	0	+ Add new
Scripts Run custom scripts to collect or generate more data.	26	+ Add new
api Go to the add-on's configuration UI and configure modular inputs under the Inputs menu.	0	+ Add new
Splunk Add-on Builder field extraction modular input Splunk Add-on Builder field extraction modular input	1	+ Add new

- In the left pane, click TCP/UDP to add an input.
- Click the TCP or UDP button to choose between a TCP or UDP input.
- In the Port field, enter a port number on which you are forwarding the logs from Cisco SD-WAN.
- In the Source name override field, enter a new source name to override the default source value, if necessary.
- Click Next to continue to the Input Settings page.

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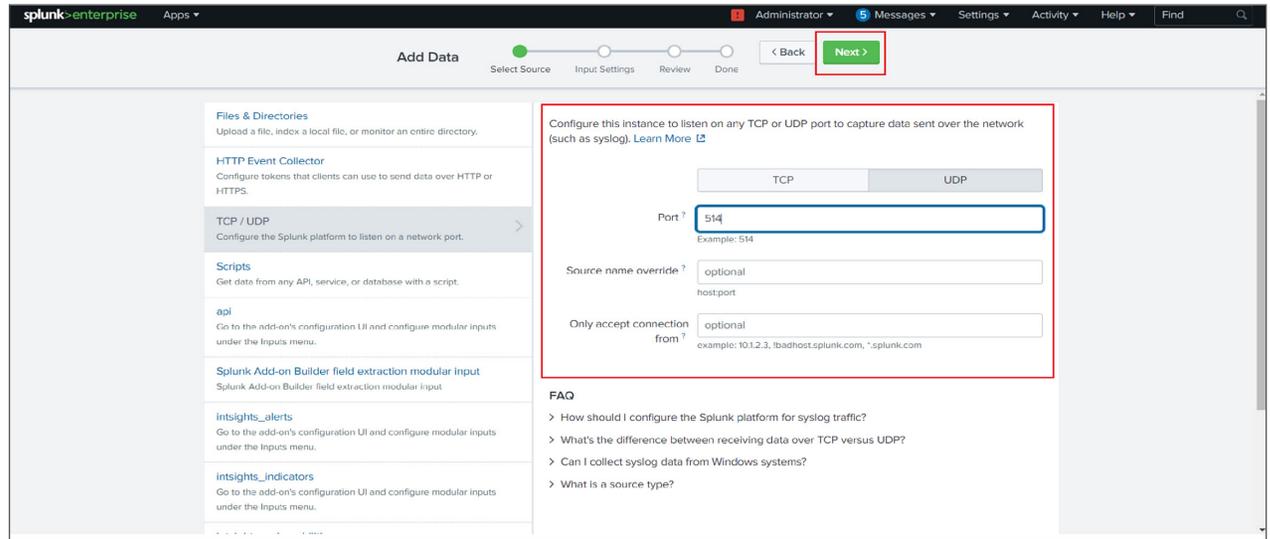
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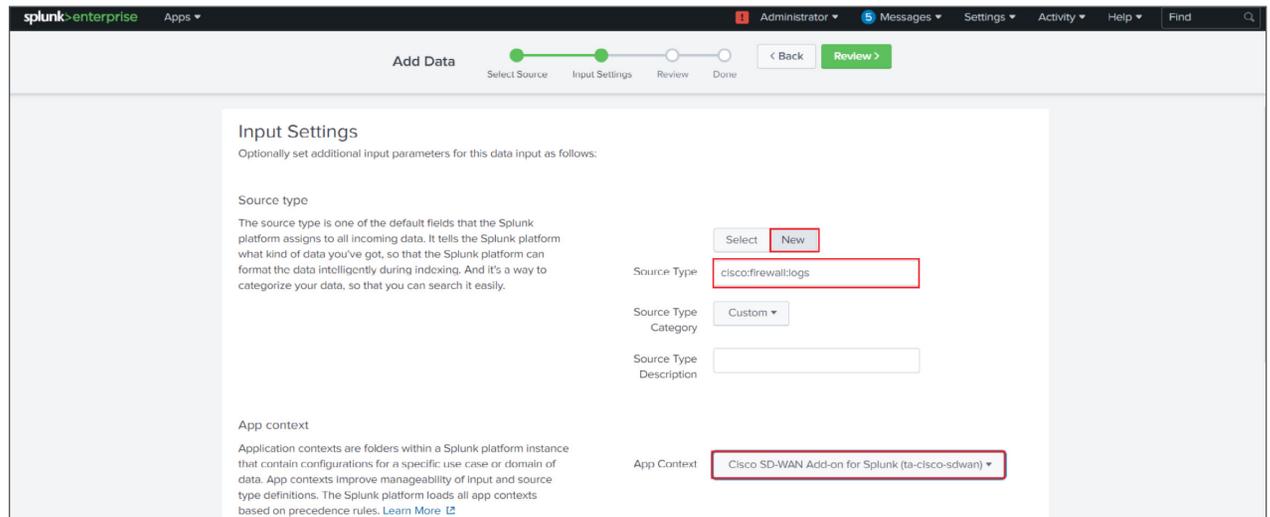
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9. Set the sourcetype as cisco:firewall:logs.

10. Set App context to Cisco SD-WAN Add-on.



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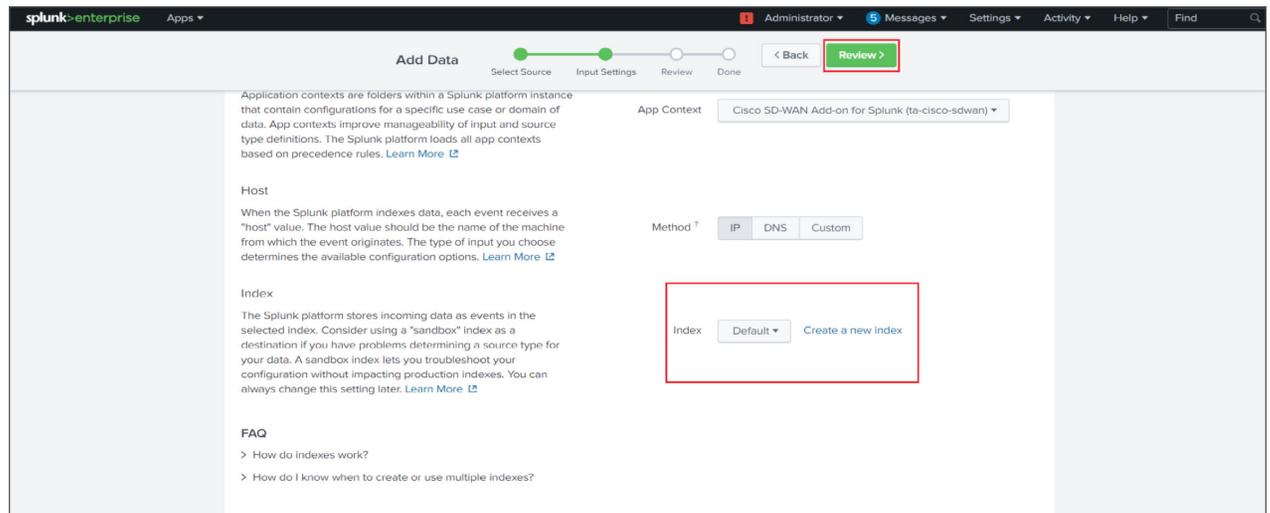
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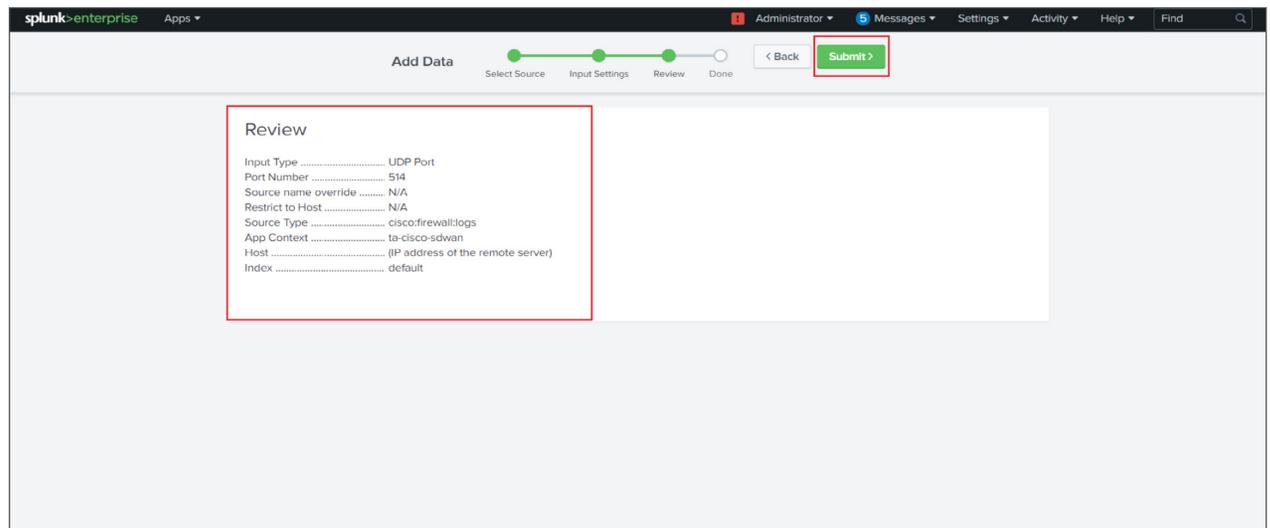
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11. Set the Index that Splunk Enterprise should send data to for this input.

12. Click Review.



13. Click Submit once you have ensured that everything is correct.



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Once the input is configured, execute the following query to see if Syslog events are being received.

```
index=<configured_index> sourcetype="cisco:sdwan"
```

Configure inputs on Splunk for NetFlow data

Steps to follow:

1. Once the “Splunk App for Stream” & “Splunk Add-on for Stream Forwarders” is installed in the desired Splunk Instance.
2. Open “Splunk App for Stream” > Click on “Configuration” > Click on “Configure Streams”
3. In the “Search” filter search for the keyword “netflow”.
4. For “netflow” stream > Goto “Action” > “Edit”
5. Update the “Mode” to “Enabled” & select the desired index, by default “main” will be selected.
6. Click on Save.
7. SSH into the Destination VM example VM: x.x.x.x (should be replaced with the VM in which data is been collected)
8. Goto Location: \$SPLUNK_HOME/etc/apps/Splunk_TA_stream/local

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9. Create a “streamfwd.conf” in the “local” folder Sample format of ‘streamfwd.conf’ as below:

```
...
[streamfwd]
netflowReceiver.<N>.ip = <ip_address>
netflowReceiver.<N>.port = <port_number>
netflowReceiver.<N>.decoder = <flow_protocol>
...
```

Below is an example file for the ip x.x.x.x and port 4739:

```
...
[streamfwd]
netflowReceiver.0.ip = x.x.x.x
netflowReceiver.0.port = 4739
netflowReceiver.0.decoder = netflow
...
```

10. Save the changes.
11. All the NetFlow events will get ingested in the Destination VM: x.x.x.x (should be replaced with the VM in which data is been collected)
12. Verify the ingestion of events by using the following query from the “Destination VM: x.x.x.x” (should be replaced with the VM in which data is been collected)
 - index=”<desired index name>” sourcetype=”stream*”

Note: Refer to the documentation for setting up a new NetFlow stream.

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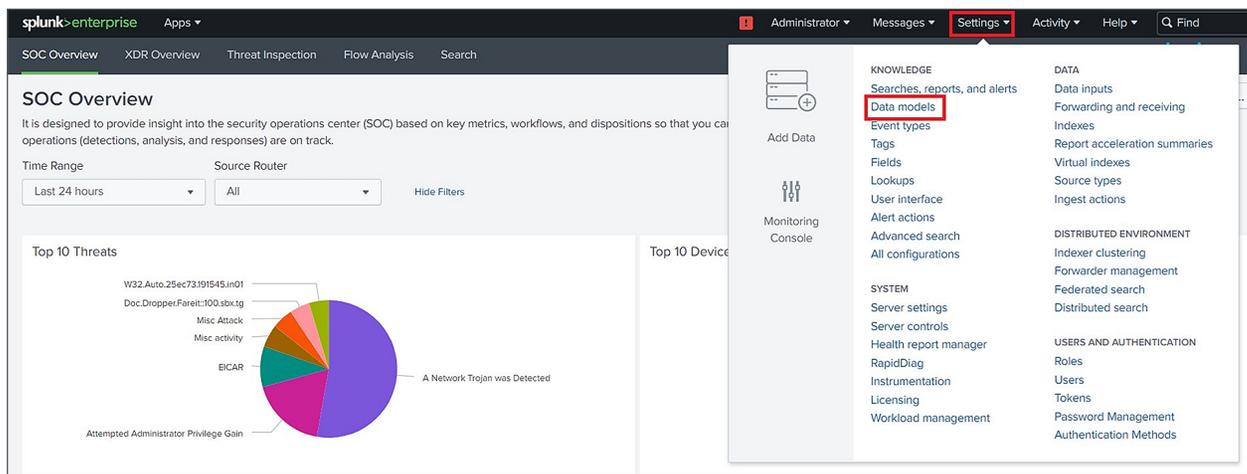
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Configure Event Types on Splunk Search Head Instance

To use the CIM mapped fields, a user first needs to configure the event type to provide the index in which the data is being collected. To configure event type:

- Navigate to Settings > Event types.



The screenshot shows the Splunk Enterprise web interface. The top navigation bar includes 'splunk-enterprise', 'Apps', and several utility menus: 'Administrator', 'Messages', 'Settings' (highlighted with a red box), 'Activity', 'Help', and a search bar. Below the navigation bar, the 'SOC Overview' dashboard is visible, featuring a pie chart titled 'Top 10 Threats' and a 'Top 10 Devices' section. A right-hand sidebar menu is open, displaying various configuration categories. Under the 'KNOWLEDGE' section, 'Event types' is highlighted with a red box. Other categories include 'DATA', 'SYSTEM', 'DISTRIBUTED ENVIRONMENT', and 'USERS AND AUTHENTICATION'.

- Select “Cisco SD-WAN Add-on for Splunk” from the App dropdown.



The screenshot shows the 'Event types' configuration page in Splunk. At the top right, there is a green 'New Event Type' button. Below the title, it indicates 'Showing 1-18 of 18 items'. A filter bar at the bottom includes an 'App' dropdown menu set to 'Cisco SD-WAN Add-on...', an 'Owner' dropdown set to 'Any', a 'Visible in the App' dropdown, a search filter input, and a '25 per page' dropdown menu.

- Click on “cisco_sdwan_index”.

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- Update “()” with “index=<your_configured_index>” in the existing definition to use your configured index.

Search string *

Tag(s)

Enter a comma-separated list of tags.

Color

Priority

Highest priority shows up first in a result.

- Click Save.

Data searching

Macros

- Cisco_sdwan_index
 - If you are using a custom index in Add-on for data collection then kindly update the “cisco_sdwan_index” macro in the app.
- Summariesonly:
 - If you want to visualize only accelerated data then change this macro to “summariesonly=true”, the Default value of the macro is “summariesonly=false”
- nataddress_regular:
 - Definition for the extracted NAT addresses to convert them to ipv4 addresses.
- nataddress_datamodel:
 - Definition for the extracted NAT addresses to convert them to ipv4 addresses in datamodel.

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Search macros

Advanced search > Search macros

Showing 1-2 of 2 items

App: Cisco SD-WAN App fo... Owner: Any Created in the App: filter 25 per page

Name	Definition	Arguments	Owner	App	Sharing	Status	Actions
cisco_sdwan_index	index=cisco_sdwan OR index=cisco_sdwan1		No owner	cisco-sdwan-app	Global Permissions	Enabled Disable	Clone
summariesonly	summariesonly=true		No owner	cisco-sdwan-app	Global Permissions	Enabled Disable	Clone

Data model

- The Cisco SD-WAN Splunk Application consists of two data models, “Cisco SDWAN” for syslog data and “Cisco SDWAN Netflow” for NetFlow data:
 - Cisco_SDWAN - Maps Syslog data based on different log types.
 - Cisco_SDWAN_NETFLOW - Maps NetFlow data from Cisco SDWAN.
- The acceleration for the data model is disabled by default.
- As all the dashboards are populated using data model queries and real-time search doesn't work with the data model, all the real-time search filters are disabled.
- If you want to improve the performance of dashboards, you just need to enable the acceleration of the data model. Please follow the below steps:
 - On the Splunk menu bar, click Settings -> Data models.

The screenshot shows the Splunk Enterprise interface. The top navigation bar includes 'Administrator', 'Messages', 'Settings', 'Activity', and 'Help'. The 'Settings' menu is open, showing a list of categories: KNOWLEDGE, DATA, SEARCHES, reports, and alerts, Event types, Tags, Fields, Lookups, User interface, Alert actions, Advanced search, All configurations, SYSTEM, Server settings, Server controls, Health report manager, RapidDiag, Instrumentation, Licensing, Workload management, DISTRIBUTED ENVIRONMENT, Indexer clustering, Forwarder management, Federated search, Distributed search, and USERS AND AUTHENTICATION, Roles, Users, Tokens, Password Management, Authentication Methods. The 'Data models' option under the 'SEARCHES, reports, and alerts' category is highlighted with a red box.

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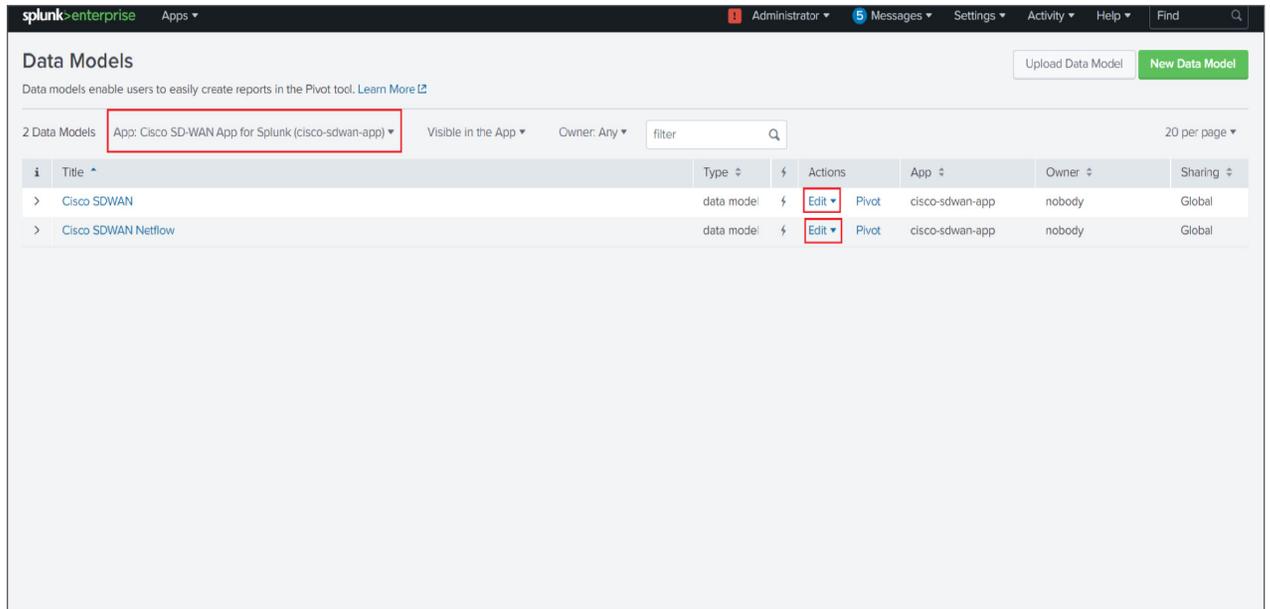
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- Select “Cisco SDWAN App for Splunk” in the “App” context dropdown.
- In the “Actions” column, click on Edit and click Edit Acceleration for the “Cisco SDWAN” Data model. This will display the pop-up menu for Edit Acceleration.



The screenshot shows the Splunk Enterprise interface for managing Data Models. The top navigation bar includes 'splunk-enterprise', 'Apps', 'Administrator', 'Messages', 'Settings', 'Activity', 'Help', and 'Find'. Below the navigation, the 'Data Models' section is active, with buttons for 'Upload Data Model' and 'New Data Model'. A filter bar shows '2 Data Models' and 'App: Cisco SD-WAN App for Splunk (cisco-sdwan-app)'. The main table lists the data models:

i	Title	Type	Actions	App	Owner	Sharing	
>	Cisco SDWAN	data model	Edit	Pivot	cisco-sdwan-app	nobody	Global
>	Cisco SDWAN Netflow	data model	Edit	Pivot	cisco-sdwan-app	nobody	Global

- Check or uncheck Accelerate checkbox to “Enable” or “Disable” data model acceleration respectively.
- If acceleration is enabled, select the summary range to specify the acceleration period. The recommended acceleration period is 7 days. The acceleration period can be changed as per user convenience.
- To save acceleration changes click on the Save button.

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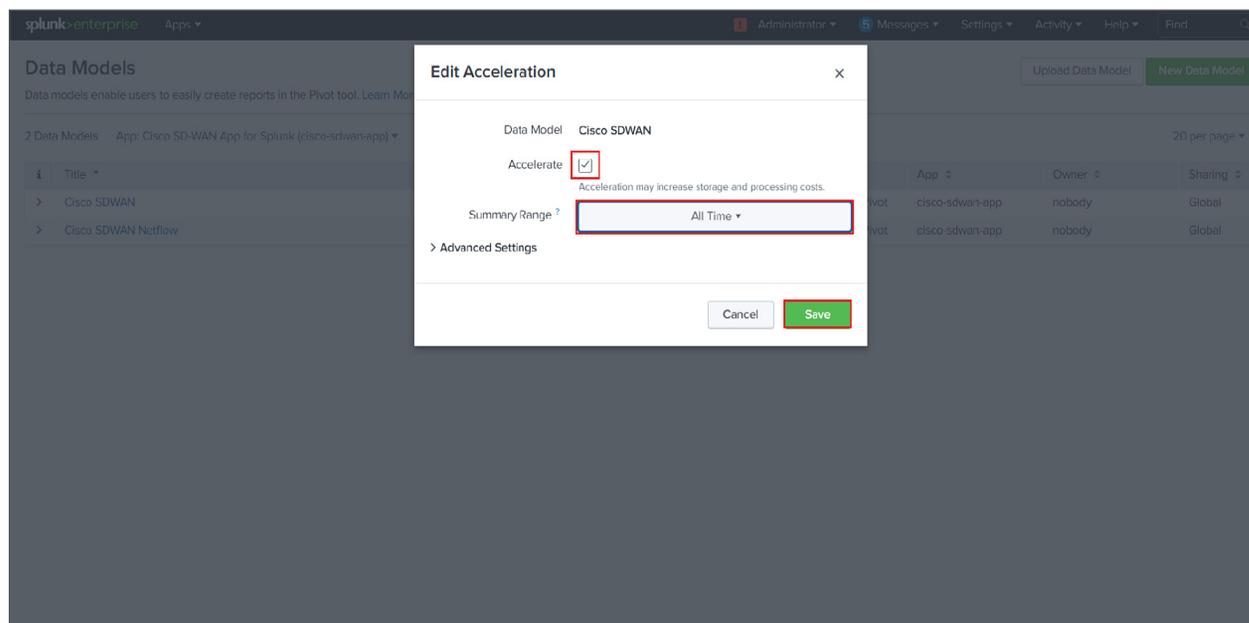
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- Follow the Similar Steps to Enable/Disable Acceleration Cisco_SDWAN_Netflow Data model
- Warning: The accelerated data models help in improving the performance of the dashboard but it increases the disk usage on the Indexer.

Dashboards

SOC dashboard

Description

It is designed to provide insight into the security operations center (SOC) based on key metrics, workflows, and dispositions so that you can monitor the efficiency of the SOC and ensure that all security operations (detections, analysis, and responses) are on track.

The dashboard will consist of the below-mentioned panels

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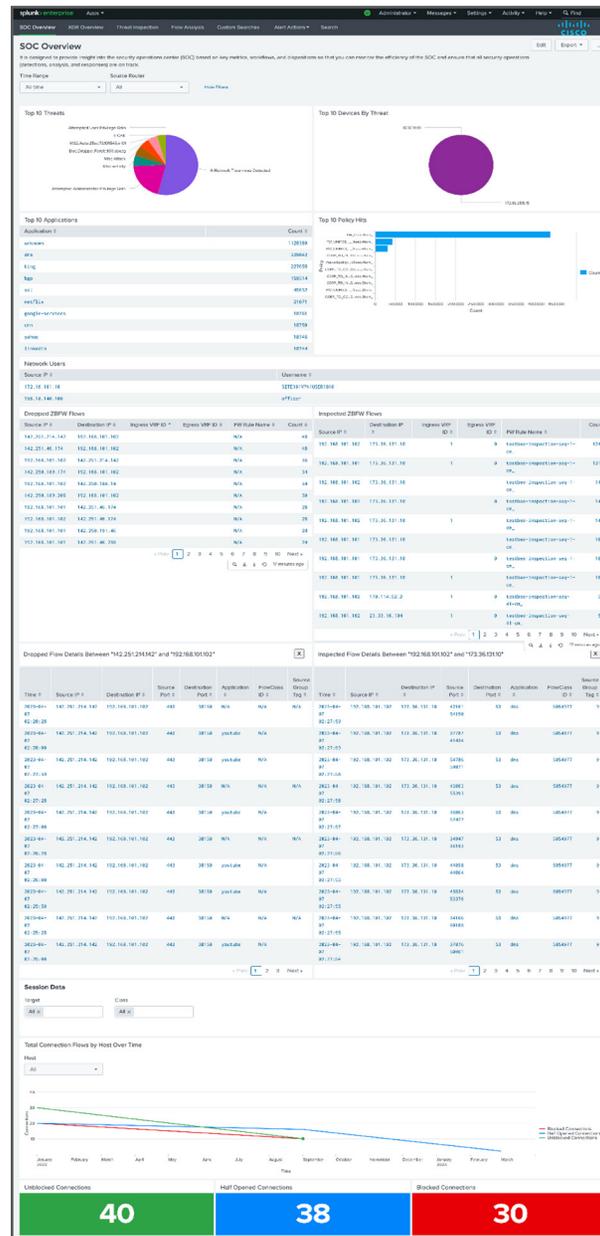
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Panels

The Dashboard should have the below panels:

1. Top 10 Threats
 - **Description:** This panel displays a Pie chart for Top 10 Threats
 - **Chart Type:** Pie Chart
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** Inline Threat Details Panel
 - **Sourcetype:** cisco:sdwan:utd:logs
2. Threat Detail for a Particular Threat
 - **Description:** This panel displays a details for particular threat
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:utd:logs
3. Top 10 Devices by Threat
 - **Description:** This panel displays a Pie chart Top 10 Devices by threat
 - **Chart Type:** Pie Chart
 - **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
 - **Drilldown (on click):** Inline Device Details Panel
 - **Sourcetype:** cisco:sdwan:utd:logs
4. Device details for a particular device
 - **Description:** This panel displays a details for particular Device
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Source IP, Source Port, Destination IP, Destination Port
 - **Drilldown (on click):** To raw events
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5. Top 10 Applications
 - **Description:** This panel displays the top 10 applications with their count
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** Inline Application Detail Panel
 - **Sourcetype:** stream:netflow
6. Application Details for a Particular Application
 - **Description:** This panel displays a details for particular Application
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Source IP, Source Port, Destination IP, Destination Port, Input Snmpidx, Output Snmpidx
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** stream:netflow
7. Top 10 Policy Hits
 - **Description:** This panel displays the top 10 Policy Hits with their count
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** Inline Policy Details Panel
 - **Sourcetype:** stream:netflow
8. Policy Details for a Particular Policy
 - **Description:** This panel displays a details for particular Policy
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Action, Source IP, Source Port, Destination IP, Destination Port, Input Snmpidx, Output Snmpidx
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** stream:netflow

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9. Total Connection Flows by Host Over Time

- **Description:** This panel displays a timechart for the top All connections
- **Chart Type:** Line Chart
- **Chart Filter:** Shared Time Range Picker, Source Router, Host, Target, Class
- **Drilldown (on click):** To raw events
- **Sourcetype:** cisco:sdwan:host:tcp:alert:on

10. Unblocked connections

- **Description:** This panel displays a single value count of a total number of unblocked connection
- **Chart Type:** Single Value
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** To panel unblocked connections by hosts
- **Sourcetype:** cisco:sdwan:unblock:host

11. Unblocked connections by unblocked hosts

- **Description:** This panel displays a table of unblocked connections by unblocked hosts with their count
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** To raw events for selected unblocked host
- **Sourcetype:** cisco:sdwan:unblock:host

12. Half opened connections

- **Description:** This panel displays a single value count of a total number of half opened connection
- **Chart Type:** Single Value
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** To Half opened connections by half opened hosts panel
- **Sourcetype:** cisco:sdwan:host:tcp:alert:on

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13. Half Opened Connections by half opened hosts

- **Description:** This panel displays a table of half opened connections by half opened hosts with their count
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** To raw events for selected half opened host
- **Sourcetype:** cisco:sdwan:host:tcp:alert:on

14. Blocked Connections

- **Description:** This panel displays a single value count of a total number of blocked connections
- **Chart Type:** Single Value
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** To raw events
- **Sourcetype:** cisco:sdwan:block:host

15. Blocked Connections by blocked hosts

- **Description:** This panel displays a table of blocked connections by blocked hosts with their count
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** To raw events for selected blocked host
- **Sourcetype:** cisco:sdwan:host:tcp:alert:on

16. Dropped ZBFW Flows

- **Description:** This panel displays a table of dropped ZBFW flows between source ip and destination ip with their total count
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** Panel for dropped flow details between source ip and destination ip
- **Sourcetype:** stream:netflow

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17. Dropped ZBFW Flows between Source IP and Destination IP

- **Description:** This panel displays a table of all the dropped ZBFW flows between source ip and destination ip
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** To raw event
- **Sourcetype:** stream:netflow

18. Inspected ZBFW Flows

- **Description:** This panel displays a table of inspected ZBFW flows between source ip and destination ip with their total count
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** Panel for inspected flow details between source ip and destination ip
- **Sourcetype:** stream:netflow

19. Inspected ZBFW Flows between Source IP and Destination IP

- **Description:** This panel displays a table of all the inspected ZBFW flows between source ip and destination ip
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
- **Drilldown (on click):** To raw event
- **Sourcetype:** stream:netflow

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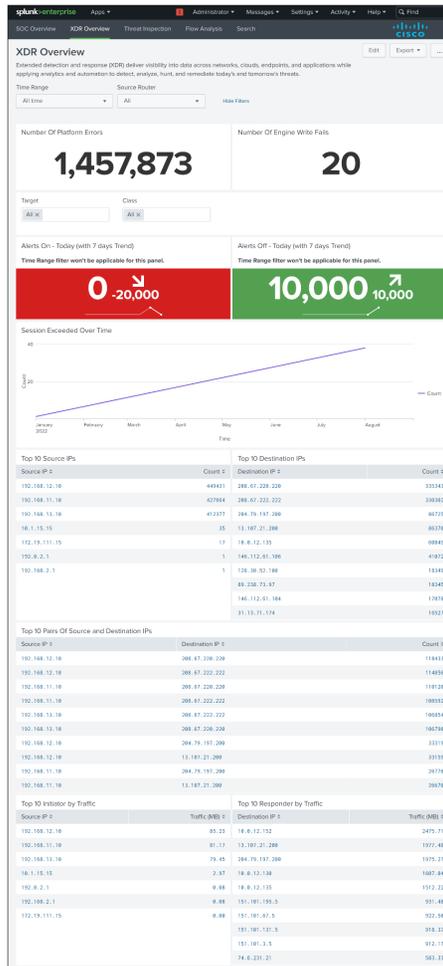
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XDR Dashboard

Description

Extended detection and response (XDR) delivers visibility into data across networks, clouds, endpoints, and applications while applying analytics and automation to detect, analyze, hunt, and remediate today's and tomorrow's threats.

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Panels

The Dashboard should have the below panels:

1. Number Of Platform Errors
 - **Description:** This panel displays a single value count of a total number of platform errors
 - **Chart Type:** Single Value
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:smart:lic:platform:error
2. Number Of Engine Write Fails
 - **Description:** This panel displays a single value count of a total number of engine write fail
 - **Chart Type:** Single Valued
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:dmi:cli:engine:write:fail
3. Alerts On - Today (with 7 days Trend)
 - **Description:** This panel displays a single value count of a total number of Alert on in last 24 hours with last month trend
 - **Chart Type:** Single Value
 - **Chart Filter:** Use Time Picker, Source Router, Target, Class
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:alert:on

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4. Alerts Off - Today (with 7 days Trend)
 - **Description:** This panel displays a single value count of a total number of Alert off in last 24 hours with last month trend
 - **Chart Type:** Single Value
 - **Chart Filter:** Use Time Picker, Source Router, Target, Class
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:alert:off
5. Session Exceeded Over Time
 - **Description:** This panel displays a timechart for the count of session exceeded in 1d span
 - **Chart Type:** Line Chart
 - **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:sessions:maximum
6. Top 10 Source IPs
 - **Description:** This panel displays a tabular view of top 10 Source IP and no. of requests
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:session:audit:trail:start
7. Top 10 Destination IPs
 - **Description:** This panel displays a tabular view of top 10 Destination IP and no. of requests
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:session:audit:trail:start

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8. Top 10 Pairs Of Source and Destination IPs
 - **Description:** This panel displays a tabular view of top 10 Source IP and Destination IP combination and no. of requests
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:session:audit:trail:start
9. Top 10 Initiator by Traffic
 - **Description:** This panel displays a tabular view of top 10 Source IP and its traffic
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:session:audit:trail
10. Top 10 Responder by Traffic
 - **Description:** This panel displays a tabular view of top 10 Destination IP and its traffic
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker, Source Router, Target, Class
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:session:audit:trail

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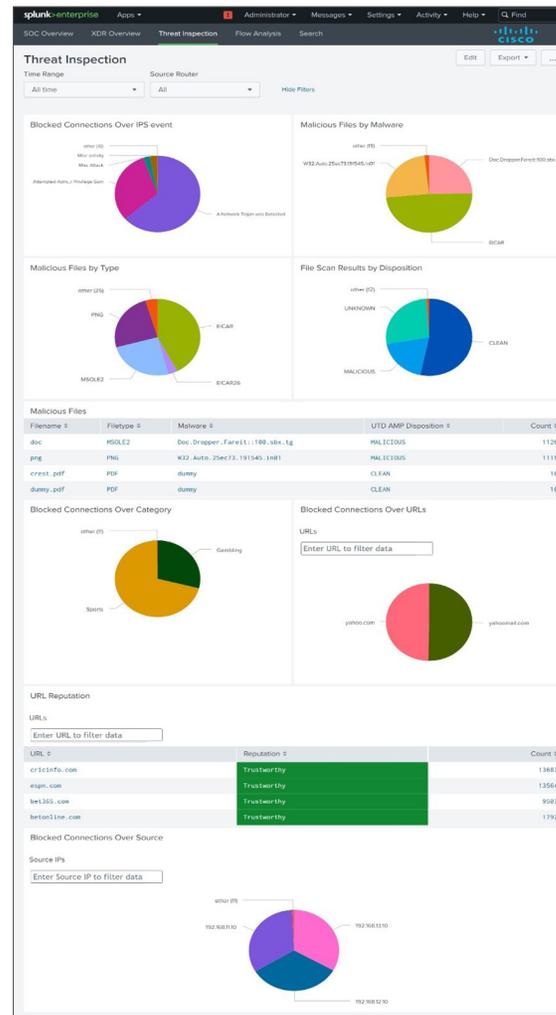
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Threat Inspection dashboard

Description

Provide tactical guidance and insights to detect, investigate and respond to the latest threats.

Screenshot



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Panels

The Dashboard should have the below panels:

1. Blocked Connections Over IPS Event
 - **Description:** This panel displays pie chart for blocked calls by classification
 - **Chart Type:** Pie Chart
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** Inline Classification Details Panel
 - **Sourcetype:** cisco:sdwan:utd:logs
2. Classification Details for a Particular IPS
 - **Description:** This panel displays a details for particular IPS
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:utd:logs
3. Malicious Files by Malware
 - **Description:** This panel displays pie chart for Malicious files by malware
 - **Chart Type:** Pie Chart
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** Inline Malware Detail Panel
 - **Sourcetype:** cisco:sdwan:utd:logs
4. Malware Details for Particular Malware
 - **Description:** This panel displays a details for particular Filetype
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:utd:log

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5. Malicious Files by Type
 - **Description:** This panel displays pie chart for Malicious files by type
 - **Chart Type:** Pie Chart
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** Inline Filetype Detail Panel
 - **Sourcetype:** cisco:sdwan:utd:logs
6. Filetype Detail for a Particular filetype
 - **Description:** This panel displays a details for particular Filetype
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:utd:logs
7. File Scan Results by Disposition
 - **Description:** This panel displays pie chart for Malicious files by disposition
 - **Chart Type:** Pie Chart
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** Inline UTD Amp Disposition Details Panel
 - **Sourcetype:** cisco:sdwan:utd:logs
8. UTD Amp Disposition Details for a Particular Malware
 - **Description:** This panel displays a details for particular Filetype
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** cisco:sdwan:utd:logs
9. Malicious Files
 - **Description:** This panel displays table of Malicious files by Filename, Filetype, Malware, UTD AMP Disposition
 - **Chart Type:** Tabular view

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- **Chart Filter:** Shared Time Range Picker, Source Router
- **Drilldown (on click):** To raw events
- **Sourcetype:** cisco:sdwan:utd:logs

10. Blocked Connections over category

- **Description:** This panel displays pie chart for blocked calls by category
- **Chart Type:** Pie Chart
- **Chart Filter:** Shared Time Range Picker, Source Router
- **Drilldown (on click):** Inline Url Details for Category Panel
- **Sourcetype:** cisco:sdwan:utd:logs

11. URL Details for Category for a Particular Category

- **Description:** This panel displays a details for url details with its Reputation for particular category
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router
- **Drilldown (on click):** Inline url detail panel
- **Sourcetype:** cisco:sdwan:utd:logs

12. URL Details for a Particular URL

- **Description:** This panel displays a details for particular url
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
- **Drilldown (on click):** To raw events
- **Sourcetype:** cisco:sdwan:utd:logs

13. Blocked Connections over URLs

- **Description:** This panel displays the blocked calls by urls with their count
- **Chart Type:** Pie chart
- **Chart Filter:** Shared Time Range Picker, Source Router, URL
- **Drilldown (on click):** Inline Url Details Panel
- **Sourcetype:** cisco:sdwan:utd:logs

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14. URL Details for a Particular URL

- **Description:** This panel displays a details for particular url
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
- **Drilldown (on click):** To raw events
- **Sourcetype:** cisco:sdwan:utd:logs

15. URL Reputation

- **Description:** This panel displays the table of the worst reputed urls with their reputation
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, URL
- **Drilldown (on click):** To raw events
- **Sourcetype:** cisco:sdwan:utd:logs

16. Blocked Connections over source

- **Description:** This panel displays the table of the blocked calls by source with their count
- **Chart Type:** Pie chart
- **Chart Filter:** Shared Time Range Picker, Source Router, Source IP
- **Drilldown (on click):** Inline Source Details Panel
- **Sourcetype:** cisco:sdwan:utd:logs

17. Source Details for a Particular Source

- **Description:** This panel displays a details for particular source
- **Chart Type:** Tabular view
- **Chart Filter:** Shared Time Range Picker, Source Router, Device IP, Device Name, Action, Source IP, Source Port, Destination IP, Destination Port
- **Drilldown (on click):** To raw events
- **Sourcetype:** cisco:sdwan:utd:logs

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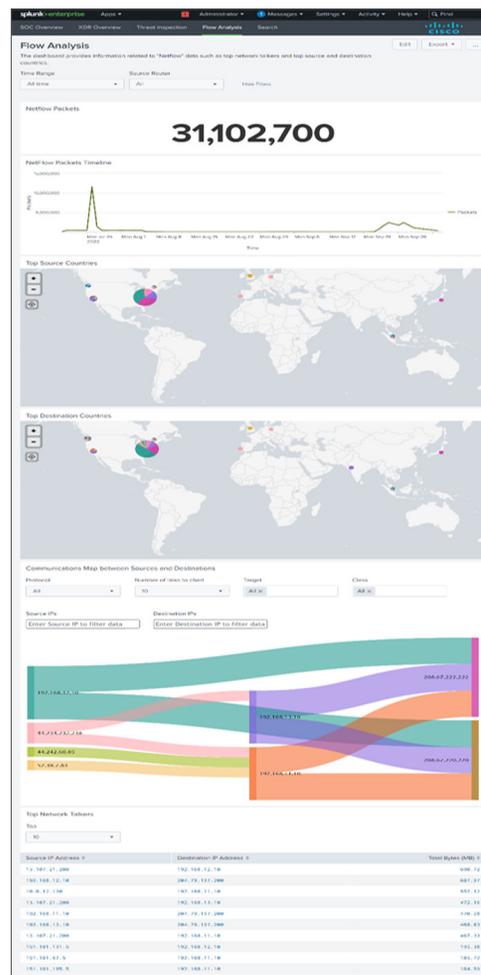
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Flow Analysis

Description

The dashboard provides information related to “Netflow” data such as top network talkers and top source and destination countries.

Screenshot



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Panels

The Dashboard should have the below panels:

1. Netflow Packets
 - **Description:** This panel displays a single value count of a total number of connection
 - **Chart Type:** Single Valued
 - **Chart Filter:** Shared Time Range Picker
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** stream:netflow
2. NetFlow Packets Timeline
 - **Description:** This panel displays the line chart netflow records packet
 - **Chart Type:** Line Chart
 - **Chart Filter:** Shared Time Range Picker
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** stream:netflow
3. Top Source Countries
 - **Description:** This panel displays the top source countries
 - **Chart Type:** Geographical Map
 - **Chart Filter:** Shared Time Range Picker
 - **Drilldown (on click):** N/A
 - **Sourcetype:** stream:netflow
4. Top Destination Countries
 - **Description:** This panel displays the top destination countries
 - **Chart Type:** Geographical Map
 - **Chart Filter:** Shared Time Range Picker
 - **Drilldown (on click):** N/A
 - **Sourcetype:** stream:netflow

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5. Communications Map Between Sources and Destinations
 - **Description:** This panel displays a sankey diagram to visualize packet transfer from source to destination based on protocol
 - **Chart Type:** Sankey Diagram
 - **Chart Filter:** Shared Time Range Picker, Source Router, Protocol, Number Of Links To Chart, Target, Class, Source IPs, Destination IPs
 - **Drilldown (on click):** N/A
 - **Sourcetype:** cisco:sdwan:log:summary
6. Top Network Talkers
 - **Description:** This panel displays the top network talkers
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** stream:netflow
7. Top 10 Application
 - **Description:** This panel displays the top 10 applications with their count
 - **Chart Type:** Tabular View
 - **Chart Filter:** Shared Time Range Picker, Source Router
 - **Drilldown (on click):** Inline Application Detail Panel
 - **Sourcetype:** stream:netflow
8. Application Details for a Particular Application
 - **Description:** This panel displays a details for particular Application
 - **Chart Type:** Tabular view
 - **Chart Filter:** Shared Time Range Picker, Source Router, Source IP, Source Port, Destination IP, Destination Port, Input Snmpidx, Output Snmpidx
 - **Drilldown (on click):** To raw events
 - **Sourcetype:** stream:netflow

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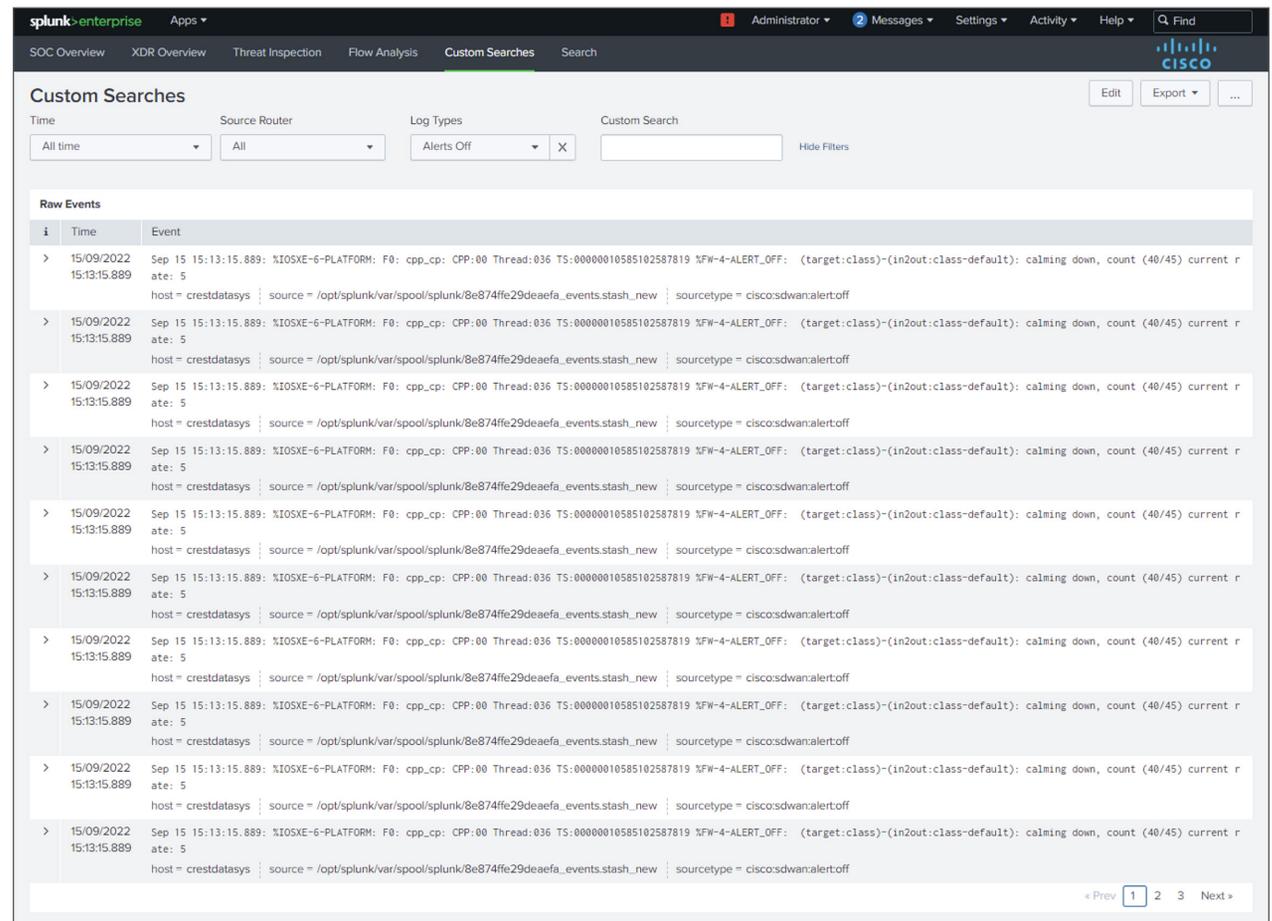
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Custom Searches

Description

The dashboard provides predefined event types that helps in searching data based on its categories.

Screenshot



The screenshot displays the Splunk Custom Searches interface. At the top, there are navigation tabs for SOC Overview, XDR Overview, Threat Inspection, Flow Analysis, Custom Searches (selected), and Search. The Custom Searches section includes filters for Time (All time), Source Router (All), Log Types (Alerts Off), and a Custom Search field. Below the filters, a table titled 'Raw Events' shows a list of search results. Each row contains an index (i), a time stamp, and the event details. The events are filtered by source router 'All' and log type 'Alerts Off'. The event details include the source router, source, and sourcetype.

i	Time	Event
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff
>	15/09/2022 15:13:15.889	Sep 15 15:13:15.889: %IOSXE-6-PLATFORM: F0: cpp_cp: CPP:00 Thread:036 TS:00000010585102587819 %FW-4-ALERT_OFF: (target:class)-(in2out:class-default): calming down, count (40/45) current rate: 5 host = crestdatasys source = /opt/splunk/var/spool/splunk/8e874fe29deaefa_events.stash_new sourcetype = ciscoSDWANalertoff

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Panels

The Dashboard contains panel having raw events for the selected filters (i.e. Time, Source Router, Log Types, Custom Search).

Time: Select the time range within which you are looking for data.

Source Router: Select the appropriate host.

Log Types: Select the types of the logs that you are looking for.

Custom Search: Search the keywords which are part of the raw events.

Event Threshold Notification

Description

The dashboard provides the user the ability to create Splunk alerts based on the “Keywords” and can set the threshold and the schedule as per the requirements.

Screenshot

The screenshot shows the Splunk Event Threshold Notification configuration page. It includes fields for Alert Name, Alert Description, Send Email to, Keyword to Monitor, and Event Threshold. Below these are fields for Time of Execution and Mins past the Hour. A note indicates that multiple emails can be specified in the 'Send Email to' field. A 'Submit' button is present. Below the configuration is a table of 'Created Alerts' with columns for Name, Description, Keyword, Threshold, Email, Cron Schedule, Earliest Time, and Latest Time.

Name	Description	Keyword	Threshold	Email	Cron Schedule	Earliest Time	Latest Time
Keyword Alert abhi	fgdfgfhghghfg	hello world	0	abcd@xyz.com	0 4 * * *	-1d	now
Keyword Alert abhi sinojia	fgdfgfh	hello world Jay	0	abcdx@xyz.com	0 6 * * 1	0	
Keyword Alert dsafda	vvz	trojan bhai	100	abhi@xy.com	45 * * * *	-1h	now
Keyword Alert dvdfvsdf	dsfdfs	sdfsdl2#%*&()	345	abhi@xy.com	0 * * * *	-1h	now
Keyword Alert dvdfvsdfnvhv	dsfdfs	sdfsdl2#%*&()👍👍👍👍👍	345	abhi@xy.com	0 * * * *	-1h	now
Keyword Alert jay bhai	fgdfgfh	hello 123Jay 345	0	ab@xyz.com	0 6 * * 1	0	
Keyword Alert sdfsdf	&*"%'\$		0	\tabhi@xy.com	0 * * * *	-1h	now
Keyword Alert sds	dsfds		0	\tabhi@xy.com	0 * * * *	-1h	now
Keyword Alert sdsas	fdsads	trojan	0	abc@xyz.com	15 * * * *	-1h	now
Keyword Alert sdsjhfdsdf		sjfhljds68068685*83545657	0	\tabhi@xy.com	0 * * * *	-1h	now

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Troubleshooting

Panels

The Dashboard contains a panel that gives details about the alerts that are created by the user.

Name: Name of the alert.

Description: Description for the respective alert.

Keyword: Keyword for which the alert is created.

Threshold: Threshold count for the keyword.

Email: Email of user to send the alert to.

Cron Schedule: Cron at which the alert is executed.

Earliest Time: Earliest time for the data to be considered.

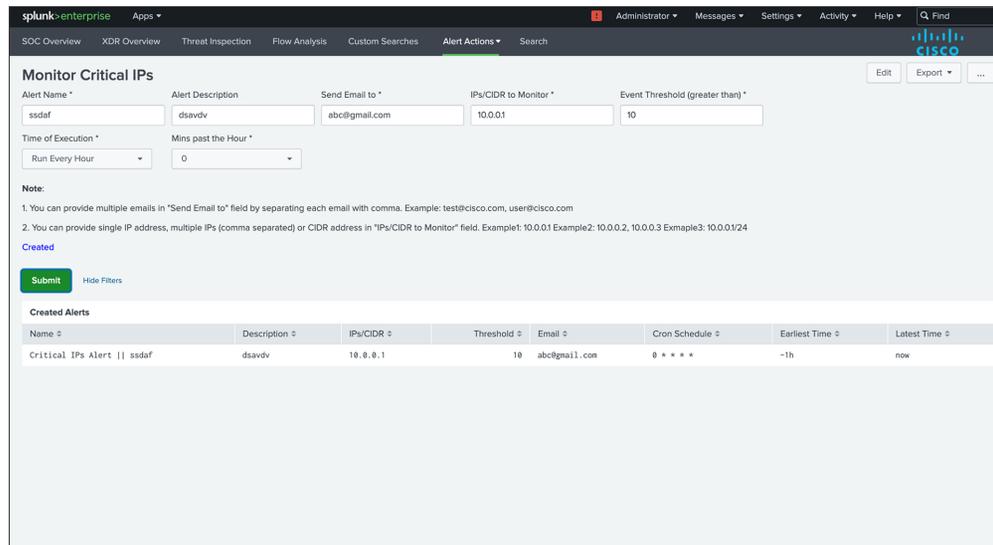
Latest Time: Latest time for the data to be considered.

Monitor Critical IPs

Description

The dashboard provides the user the ability to create Splunk alerts based on the “IPs/CIDR” and can set the threshold and the schedule as per the requirements.

Screenshot



The screenshot shows the Splunk Enterprise interface for configuring an alert. The 'Monitor Critical IPs' panel is active, displaying the following configuration:

- Alert Name: ssdaf
- Alert Description: dsavdv
- Send Email to: abc@gmail.com
- IPs/CIDR to Monitor: 10.0.0.1
- Event Threshold (greater than): 10
- Time of Execution: Run Every Hour
- Mins past the Hour: 0

Below the configuration form, there is a 'Created Alerts' table with the following data:

Name	Description	IPs/CIDR	Threshold	Email	Cron Schedule	Earliest Time	Latest Time
Critical IPs Alert ssdaf	dsavdv	10.0.0.1	10	abc@gmail.com	0 * * * *	-1h	now

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Panels

The Dashboard contains a panel that gives details about the alerts that are created by the user.

Name: Name of the alert.

Description: Description for the respective alert.

IPs/CIDR: IPs/CIDR for which the alert is created.

Threshold: Threshold count for the IPs/CIDR.

Email: Email of user to send the alert to.

Cron Schedule: Cron at which the alert is executed.

Earliest Time: Earliest time for the data to be considered.

Latest Time: Latest time for the data to be considered.

Uninstalling Cisco SD-WAN App and Add-on for Splunk

Disabling the App and Add-on

To disable the App and Add-on, you must be logged into Splunk as an Administrator and follow the steps below.

- Click the App name in the title bar, and then click Manage Apps.
- In the search box, type the name of the app, and then click Search. In the Status column, next to both the App and Add-on, click Disable

Uninstalling the App and Add-on

Follow the below instructions based on your environment.

Uninstall from a standalone environment

1. Disable the App and Add-on from the Splunk user interface as detailed above.
2. Log into the Splunk machine from the backend and delete the App and Add-on folders. The app and its directory are typically located in `$SPLUNK_HOME/etc/apps/cisco-sdwan-app`, and add-on and its directory are typically located in `$SPLUNK_HOME/etc/apps/ta-sdwan-app`.

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3. Verify that no local configuration files related to Cisco SDWAN App/Add-on are available in the `$SPLUNK_HOME/etc/system` and `$SPLUNK_HOME/etc/users` folders. If the local folder is present, remove it as well.
4. Restart Splunk.

Uninstall from a distributed or clustered environment (To be Checked)

In a cluster or distributed environment, the Cisco SD-WAN App is installed on all the Search Heads and the Cisco SD-WAN Add-on is installed on Search Heads and Forwarders.

The steps to uninstall the App and Add-on are the same as for Standalone.

1. To perform any installation or uninstallation step on all the search nodes of a distributed environment, use a deployer manager.
2. From the deployer machine, go to `$SPLUNK_HOME/etc/shcluster/apps` and remove the App and Add-on folders and execute cluster bundle command. [Refer](#)

Troubleshooting

Cisco SD-WAN Add-on for Splunk

- To check the fields extracted for Syslog data by the Cisco SDWAN Add-on for Splunk:
 - `index=<your_index_name> sourcetype="cisco:sdwan"` in Splunk in verbose mode.
 - "cisco:firewall:logs" must be selected as sourcetype while configuring the Syslog input.
- To check the fields extracted for Netflow data by the Cisco SDWAN Add-on for Splunk:
 - `index=<your_index_name> sourcetype="stream"` in Splunk in verbose mode.

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Troubleshooting

Cisco SD-WAN App for Splunk

- If dashboards are not getting populated or found data discrepancy between the panel search result and drilldown search result:
 - Check whether you have correctly configured the index in the `cisco_sdwan_index` macro.
 - Also, you can verify if the data is there in the index by running the search query:
 - `index="<your_index_name>"`
 - Try expanding Time Range.
- If in SOC Dashboard “Top 10 Applications” Panel is not getting populated run the savesearch as per the given steps:
 - Go to Settings -> Searches, reports, and alerts
 - Select “Cisco SD-WAN for Splunk” in the “App” context dropdown and “All” in the “Owner” dropdown.
 - Run the “`cisco_sdwan_netflow`” savedsearch with “All time” time range.
- If in SOC Dashboard “Top 10 Policy Hits” Panel is not getting populated run the savesearch as per the given steps:
 - Go to Settings -> Searches, reports, and alerts
 - Select “Cisco SD-WAN for Splunk” in the “App” context dropdown and “All” in the “Owner” dropdown.
 - Run the “`cisco_sdwan_action`” and “`cisco_sdwan_policy`” savedsearches with “All time” time range.