



## **Cisco Catalyst Center Rogue Management and aWIPS Application Quick Start Guide, Release 2.3.7.x**

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# CHAPTER 1

## New and Changed Information

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## CHAPTER 2

# Catalyst Center Rogue Management and aWIPS Application

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- [About Rogue Management, on page 4](#)
- [About Advanced Wireless Intrusion Prevention System, on page 6](#)
- [Scale Information, on page 9](#)
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## Introduction to the Rogue Management and aWIPS Application



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**Note** In releases earlier than Release 2.1.2.0, Rogue Management capabilities were provisioned as a part of Device Controllability. After a Catalyst Center upgrade, the provisioned Rogue Management subscriptions are not automatically removed from a previously discovered Cisco Wireless Controller. Rogue Management detection might be reported inconsistently on a newly discovered wireless controller.

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The Rogue Management application is an optional package that you can install on Catalyst Center. Operating within Catalyst Center, the Rogue Management application helps you monitor threats from unauthorized access points (APs). You can access the Rogue Management functionality as a dashboard within Cisco Catalyst Assurance in the Catalyst Center GUI.



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**Note** In Release 2.3.7 and later, the Rogue Management and aWIPS application package is applicable for virtual appliances (VAs).

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Because the Cisco Advanced Wireless Intrusion Prevention System (aWIPS) is integrated with Catalyst Center, you can monitor the aWIPS signatures within the Rogue and aWIPS dashboard.

This guide describes how to activate the Rogue and aWIPS application package on Catalyst Center. This guide also explains prerequisites and configurations, describes how to monitor the Rogue and aWIPS dashboard, and offers important notes and limitations.

**Note**

- The provisioning actions like Rogue and aWIPS subscription enable and disable are supported for IPv6 deployment.
- The provisioning actions like aWIPS profile configuration and manual containment or autocontainment for wired and wireless devices are not supported for IPv6 deployment.

The Rogue Management application supports the following Cisco AireOS Controller models running Cisco AireOS Release 8.8.111.0 or later:

- Cisco 3504 Wireless Controller
- Cisco 5520 Wireless Controller
- Cisco 8540 Wireless Controller
- Cisco Mobility Express

The following Cisco Catalyst 9800 Series Wireless Controller models support the Rogue Management application:

- Cisco Catalyst 9800 Embedded Wireless Controller for Catalyst 9300 Series Switches
- Cisco Catalyst 9800-40 Wireless Controller
- Cisco Catalyst 9800-80 Wireless Controller
- Cisco Catalyst 9800-CL Cloud Wireless Controller
- Cisco Catalyst 9800-L Wireless Controller
- Cisco Embedded Wireless Controller on Catalyst Access Points

The aWIPS application supports Cisco Catalyst 9800 Series Wireless Controller Release 17.1.x and later Cisco Catalyst 9100 Series Access Points, and Cisco 802.11ac Wave 2 Aironet Access Points.

The following Cisco Catalyst 9800 Series Wireless Controller models support the aWIPS application:

- Cisco Catalyst 9800 Embedded Wireless Controller for Catalyst 9300 Series Switches
- Cisco Catalyst 9800-40 Wireless Controller
- Cisco Catalyst 9800-80 Wireless Controller
- Cisco Catalyst 9800-CL Cloud Wireless Controller
- Cisco Catalyst 9800-L Wireless Controller
- Cisco Embedded Wireless Controller on Catalyst Access Points

## About Rogue Management

The Rogue Management application in Catalyst Center detects and classifies threats and enables network administrators, network operators, and security operators to monitor network threats. Catalyst Center helps



in quickly identifying the highest-priority threats and allows you to monitor these threats in the **Rogue and aWIPS** dashboard within Cisco Catalyst Assurance.

A rogue device is an unknown AP or client that is detected by the managed APs in your network. A rogue AP can disrupt wireless LAN operations by hijacking legitimate clients. A hacker can use a rogue AP to capture sensitive information, such as usernames and passwords. The hacker can then transmit a series of clear-to-send (CTS) frames. This action mimics an AP informing a particular client to transmit, while instructing all the others to wait. This results in legitimate clients not being able to access network resources. Therefore, wireless LAN service providers have a strong interest in banning rogue APs from air space.

Because rogue APs are inexpensive and readily available, employees sometimes plug unauthorized rogue APs into the existing LANs and build ad hoc wireless networks without the knowledge or consent of the IT department. These rogue APs can be a serious breach of network security when they are plugged into a network port behind the corporate firewall. Because employees generally do not enable any security settings on a rogue AP, it is easy for unauthorized users to use the AP to intercept network traffic and hijack client sessions. Even more alarming is that wireless users frequently publish insecure AP locations, which increases the odds of having enterprise security breaches.

Catalyst Center constantly monitors all the nearby APs and automatically discovers and collects information about rogue APs.

When Catalyst Center receives a rogue event from a managed AP, it responds as follows:

- If the unknown AP is not managed by Catalyst Center, Catalyst Center applies the rogue classification rules.
- If the unknown AP is not using the same SSID as your network, Catalyst Center verifies whether the AP is connected to the corporate wired network and extends to the wired network. If the rogue AP is physically connected to the switch port of the corporate network, Catalyst Center classifies the AP as **Rogue on wire**.

Cisco switches managed by Catalyst Center are required for rogue on wire to work.



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**Note** There is a scenario in which an AP that is not rogue on wire may incorrectly get classified as rogue on wire by Catalyst Center. This incorrect classification happens when a rogue client roams from a rogue-on-wire AP to a nonrogue-on-wire AP. A new rogue client report with the new rogue AP information is received and a host entry for the client is available on Catalyst Center before the deletion of the rogue client information. This happens because it takes some time for the rogue client switch port details to get deleted on the switch and synchronized with Catalyst Center. Therefore, the new rogue AP that the client roamed to is classified as rogue on wire before the synchronization happens.

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- If the AP is unknown to Catalyst Center, and is using the same SSID as your network, Catalyst Center classifies the AP as a **Honeypot**.

**Note**

- The detected SSID that was earlier classified as Honeypot is not retained in the backup. Therefore, after a restore operation, the SSID is not classified as Honeypot.
- Even if the SSID is deleted from the wireless controller, the SSID is still classified as Honeypot on Catalyst Center. The Honeypot classification does not happen when the detected SSID is not restored back on Catalyst Center when the Catalyst Center backup is restored.

- If the unknown AP is not using the same SSID as your network and is not connected to the corporate network, Catalyst Center verifies whether it is causing any interference. If it is, Catalyst Center classifies the AP as **Interferer** and marks the rogue state as **Potential Threat**. The threshold level for classifying the interferers on the network is greater than -75 dBm.
- If the unknown AP is not using the same SSID as your network, and is not connected to the corporate network, Catalyst Center verifies whether it is a neighbor. If it is a neighbor, Catalyst Center classifies the AP as **Neighbor** and marks the rogue state as **Informational**. The threshold level for classifying the rogue AP as a neighbor AP is less than or equal to -75 dBm.

## About Advanced Wireless Intrusion Prevention System

The Cisco Advanced Wireless Intrusion Prevention System (aWIPS) is a wireless intrusion threat detection and mitigation mechanism. aWIPS uses an advanced approach to wireless threat detection and performance management. An AP detects threats and generates alarms. It combines network traffic analysis, network device and topology information, signature-based techniques, and anomaly detection to deliver highly accurate and complete wireless threat prevention.

With a fully infrastructure-integrated solution, you can continually monitor wireless traffic on both wired and wireless networks and use that network intelligence to analyze attacks from many sources to pinpoint accurately, and proactively prevent attacks, rather than wait until damage or exposure has occurred.

Because the aWIPS functionality is integrated into Catalyst Center, the aWIPS can configure and monitor WIPS policies and alarms and report threats.

aWIPS supports the following capabilities:

- Static signatures
- Standalone signature detection
- Alarms
- Static signature file packaged with controller and AP image

Catalyst Center supports the following signatures that detect various denial of service (DoS) attacks:

- **Authentication flood:** A form of DoS attack that floods an AP's client-state table (association table) by imitating many client stations (MAC address spoofing), and sending authentication requests to the AP. Upon reception of each individual authentication request, the target AP creates a client entry in State 1 of the association table. If open system authentication is used for the AP, the AP returns an authentication success frame and moves the client to State 2. If Shared Key Authentication (SHA) is used for the AP,

the AP sends an authentication challenge to the attacker's imitated client, which does not respond, and the AP keeps the client in State 1. In either of these scenarios, the AP contains multiple clients hanging in either State 1 or State 2, which fills up the AP association table. When the table reaches its limit, legitimate clients are not able to authenticate and associate with this AP.

- **Association flood:** A form of DoS attack that aims to exhaust an AP's resources, particularly the client association table, by flooding the AP with many spoofed client associations. An attacker using such a vulnerability can emulate many clients to flood a target AP's client association table by creating many clients. When the client association table overflows, legitimate clients cannot get associated.
- **CTS Flood:** A form of DoS attack when a specific device sends a bulk Clear To Send (CTS) control packet to wireless devices sharing the same radio frequency (RF) medium, and blocking wireless devices from using the RF medium until CTS flood stops.
- **RTS Flood:** A form of DoS attack when a specific device sends a bulk RTS control packet to an AP for blocking wireless bandwidth, which leads to performance disturbance for the clients on that AP.
- **Broadcast Probe:** A form of DoS attack when a specific device tries to flood a managed AP with broadcast probe requests.
- **Disassociation Flood:** A form of DoS attack that aims to send an AP to the unassociated or unauthenticated State 2 by spoofing disassociation frames from the AP to a client. With client adapter implementations, this form of attack is effective in immediately disrupting wireless services against this client. Typically, client stations reassociate to regain service until the attacker sends another disassociation frame. An attacker repeatedly spoofs the disassociation frames to keep the client out of service.
- **Disassociation Broadcast:** A form of DoS attack when a specific device triggers a disassociation broadcast to disconnect all the clients.

This attack aims to send an AP's client to the unassociated or unauthenticated State 2 by spoofing disassociation frames from the AP to the broadcast address of all the clients. With current client adapter implementations, this form of attack immediately disrupts wireless services against multiple clients. Typically, client stations reassociate to regain service until the attacker sends another disassociation frame. An attacker repeatedly spoofs the disassociation frames to keep all the clients out of service.

- **Deauthentication flood:** A form of DoS attack that aims to send an AP's client to the unassociated or unauthenticated State 1 by spoofing deauthentication frames from the AP to the client unicast address. With the current client-adapter implementations, this form of attack immediately disrupts wireless services against the client. Typically, client stations reassociate and reauthenticate to regain service until the attacker sends another deauthentication frame. An attacker repeatedly spoofs the deauthentication frames to keep all the clients out of service.
- **Deauthentication broadcast:** A form of DoS attack that sends all the clients of an AP to the unassociated or unauthenticated State 1 by spoofing deauthentication frames from the AP to the broadcast address. With client adapter implementation, this form of attack immediately disrupts wireless services against multiple clients. Typically, client stations reassociate and reauthenticate to regain service until the attacker sends another deauthentication frame.
- **EAPOL logoff flood:** A form of DoS attack when a specific device tries to send Extensible Authentication Protocol over LAN (EAPOL) logoff packets, which are used in the WPA and WPA2 authentication for (DoS).

Because the EAPOL logoff frame is not authenticated, an attacker can potentially spoof this frame and log out a user from an AP, thus committing a DoS attack. The fact that the client is logged out from the AP is not obvious until the client attempts communication through the WLAN. Typically, the disruption

is discovered and the client reassociates and authenticates automatically to regain the wireless connection. The attacker can continuously transmit the spoofed EAPOL-logoff frames.

- **Airdrop Session:** Airdrop session attack happens when an AirDrop, which is an Apple feature is used to set up a peer-to-peer link for file sharing. This potentially creates a security risk because of the unauthorized peer-to-peer network being dynamically created in your WLAN environment.
- **Authentication Failure Flood:** Authentication failure flood attack happens when a specific device tries to flood the AP with invalid authentication requests spoofed from a valid client, leading to disconnection.
- **Beacon Flood:** A form of DoS attack that allows an attacker to inhibit wireless activity for the entire enterprise infrastructure by preventing new associations between valid APs and stations. During a beacon flood attack, stations that are actively seeking a network are bombarded with beacons from networks generated using different MAC addresses and SSIDs. This flood can prevent a valid client from detecting the beacons sent by the corporate APs, and thus, a DoS attack is initiated.
- **Block Ack Flood:** A form of DoS attack that allows an attacker to prevent an 802.11n AP from receiving frames from a specific valid corporate client. With the introduction of the 802.11n standard, a transaction mechanism is introduced, which allows a client to transmit a large block of frames at once, rather than dividing them up into segments. In order to initiate this exchange, the client sends an Add Block Acknowledgment (ADDBA) request to the AP. This request contains sequence numbers to inform the AP of the size of the block being transmitted. The AP then accepts all the frames that fall within the specified sequence (consequently dropping any frames that fall outside of the range) and transmits a BlockACK message back to the client when the transaction is completed.
- **EAPOL-Start V1 Flood:** An attacker attempts to bring down an AP by flooding it with EAPOL-Start frames to exhaust the internal resources of an AP.
- **Fuzzed Beacon:** An invalid, unexpected, or random data is introduced into the beacon. The modified frames are then replayed into the air. This can cause unexpected behavior in the destination device, including driver crashes, operating system crashes, and stack-based overflows, which allows execution of arbitrary code on the affected system.
- **Fuzzed Probe Request:** An invalid, unexpected, or random data is introduced into a probe request. The modified frames are then replayed into the air.
- **Fuzzed Probe Response:** An invalid, unexpected, or random data is introduced into a probe response. The modified frames are then replayed into the air.
- **Invalid MAC OUI Frame:** A spoofed MAC address, which does not have a valid OUI, is used.
- **Malformed Association Request:** An attacker sends a malformed association request, which can trigger a bug in an AP, leading to a DoS attack.
- **Malformed Authentication:** An attacker sends malformed authentication frames, which can expose vulnerabilities, if any, in some drivers.
- **Probe Response Flood:** A form of DoS that allows an attacker to prevent a station from associating with a valid corporate AP. In a typical wireless transaction, when a station wants to associate with an AP, it transmits a probe request from to obtain information about the AP's network. The station then waits for the resulting probe response frame from the AP. An attacker can take advantage of this process by flooding the environment with invalid probe responses, thus preventing the station from receiving the response from the valid AP. As a result, the station is rendered unable to connect to the wireless network, and a DoS attack is initiated.

- **PS Poll Flood:** A potential hacker spoofs the MAC address of a wireless client and sends out a flood of PS-Poll frames. The AP then sends out the buffered data frames to the wireless client, which leads to the client missing the data frames because it could be in the power save mode.
- **Reassociation Request Flood:** A form of DoS attack that exhausts an AP's resources, particularly the client association table by flooding the AP with a large number of emulated and spoofed client reassociations. When the client association table overflows, legitimate clients are not able to get associated, causing a DoS attack.
- **Targeted Deauthentication:** There is visibility into both the source and the destination of attacks for enhanced context of the threat.
- **CTS Virtual Carrier Sense Attack:** A form of DoS attack when the MAC address of an 802.11n AP is modified. This allows large-duration values for CTS frame types by preventing channel access to legitimate users.
- **RTS Virtual Carrier Sense Attack:** A form of DoS attack when the MAC address of an 802.11n AP is modified. This allows large-duration values for Request To Send (RTS) frame types by preventing channel access to legitimate users.

## Scale Information

This table shows the number of rogue APs and rogue clients supported on different versions of the Catalyst Center appliance.

**Table 1: Number of Rogue APs and Rogue Clients Supported**

Catalyst Center Appliance	No. of Rogue APs Supported	No. of Rogue Clients Supported	No. of aWIPS Events per Day
44-core Catalyst Center appliance	24,000	32,000	20,000
56-core Catalyst Center appliance	24,000	32,000	30,000
112-core Catalyst Center appliance	96,000	128,000	65,000

## Basic Setup Workflow

**Step 1** Install Catalyst Center.

For more information, see the [Cisco Catalyst Center Installation Guide](#).

**Step 2** Download and install the **Rogue and aWIPS** application package.

For more information, see [Download and Install the Rogue Management and aWIPS Application Package, on page 11](#).

- Step 3** Enable the Rogue and aWIPS application in the **Assurance > Rogue and aWIPS** window.
- This enables rogue reporting on the Cisco Wireless Controller and Cisco Catalyst 9800 Series Wireless Controllers.
- To access the Rogue and aWIPS application, log in to Catalyst Center. From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS**.
- Step 4** Discover devices such as Cisco Wireless Controller and APs using the Discovery feature.
- Discover Cisco Wireless Controllers using the management IP address instead of the service port IP address.
- Note** If the device is removed from Catalyst Center without enabling a configuration cleanup, the older subscriptions remain intact. If the device is then readded to Catalyst Center, because the telemetry subscriptions are already present, data starts flowing in and rogue/aWIPS threat data is shown on the dashboard. To correct the telemetry subscriptions, assign the device to a site.
- Step 5** Make sure that the discovered devices are listed in the **Device Inventory** window.
- The devices should be reachable and in **Managed** state in the **Device Inventory** window.
- Step 6** Design your network hierarchy by adding sites, buildings, and floors so that later, you can easily identify where to apply design settings or configurations.
- You can either create a new network hierarchy, or, if you have an existing network hierarchy in Cisco Prime Infrastructure, import it into Catalyst Center.
- Step 7** Add the location information of APs and position the APs on the floor map to get a coverage heatmap visualization.
- Step 8** (Optional) If your network uses Cisco Identity Services Engine (ISE) for user authentication, you can configure Cisco Catalyst Assurance for Cisco ISE integration. This enables you to see more information about wired clients, such as the username and operating system, in Cisco Catalyst Assurance. For more information, see "About Cisco ISE Configuration for Catalyst Center" in the [Cisco Catalyst Assurance User Guide](#).
- Step 9** (Optional) Configure syslog, SNMP traps, and NetFlow Collector servers using Telemetry. For more information, see "Configure Syslog, SNMP Traps, NetFlow Collector Servers, and Wired Client Data Collection Using Telemetry" in the [Cisco Catalyst Assurance User Guide](#).
- Step 10** Start using the Cisco Catalyst Assurance application.
- Step 11** (Optional) Integrate and synchronize Cisco Connected Mobile Experiences (CMX) with Catalyst Center. For more information, see "About Cisco Connected Mobile Experiences Integration" in the [Cisco Catalyst Assurance User Guide](#).
- You can get the precise location details for a specific rogue AP on the floor map, depending on the detecting AP's strongest signal strength, or x and y coordinate information from Cisco CMX.
- Note** If you do not have Cisco CMX integrated with Catalyst Center, the rogue AP is displayed in the site map around the detecting AP with the strongest RSSI.
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## CHAPTER 3

# Install Catalyst Center Rogue Management Application Package

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- [Application Management, on page 11](#)
- [Download and Install the Rogue Management and aWIPS Application Package, on page 11](#)

## Application Management

Catalyst Center provides many of its functions as individual applications, that are packaged separately from the Catalyst Center core infrastructure. You can install and run the applications that you want, and uninstall those that you are not using, depending on your preferences.

From the top-left corner, click the menu icon and choose **System > Software Updates**. The number and type of application packages shown in the **Software Updates** window vary depending on your Catalyst Center version and licensing level. All the available application packages are shown, whether or not they are currently installed.

For a description of a package and whether it is required, hover your cursor over the package's name in the **Updates** tab in the **System > Software Updates** window.

## Download and Install the Rogue Management and aWIPS Application Package

### Before you begin

Only a user with SUPER-ADMIN-ROLE permissions can perform this procedure.

The Rogue Management and aWIPS application is not installed on Catalyst Center by default. You must manually install the Rogue and aWIPS application package separately.

Rogue Management requires an Essentials license and aWIPS requires an Advantage license.

Perform the application management procedure from the **Software Management** window.

1. Install Catalyst Center. For more information, see the [Cisco Catalyst Center Installation Guide](#).
2. Review the software requirements described in the [release notes](#).

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**Step 1** From the top-left corner, click the menu icon and choose **System > Software Management**.

**Step 2** Scroll down to the **Available Applications for 2.3.x.x-xxxxx** area and choose **Rogue And AWIPS**.

**Step 3** Click **Install**.

For more information on how to download and install the Rogue and aWIPS application package updates, see the "Download and Install Application Updates" topic in the [Cisco Catalyst Center Administrator Guide](#).

**Step 4** After installing the package, enable the Rogue Management application.

- a) From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS**.
- b) From the **Rogue** drop-down list, choose **Enable**.

This enables rogue detection on the Cisco Wireless Controller and the Cisco Catalyst 9800 Series Wireless Controllers.

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## CHAPTER 4

# Monitor the Rogue and aWIPS Dashboard

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- [Monitor the Rogue Management and aWIPS Dashboard, on page 13](#)
- [Monitor Network Rogue Threats, on page 21](#)
- [Obtain Rogue AP and Rogue Client Details from Threat 360° View, on page 24](#)
- [Download aWIPS Profile Forensic Capture from Threat 360° View, on page 27](#)

## Access the Rogue Management and aWIPS Application

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**Step 1** To access the Rogue Management and aWIPS application, log in to Catalyst Center.

**Step 2** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS**.

The **Rogue and aWIPS** dashboard is displayed.

**Note** Before using the Cisco Catalyst Assurance application, you must configure it. For more information, see [Basic Setup Workflow, on page 9](#).

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## Monitor the Rogue Management and aWIPS Dashboard

Use the **Rogue and aWIPS** dashboard to get a detailed threat analysis and a global view of all the rogue APs and aWIPS signatures detected in the network. The Rogue and aWIPS dashboard also provides insight into the highest-priority threats so that you can quickly identify them. The Rogue Management application uses streaming telemetry to retrieve data on rogue APs.

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**Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS**.

The **Rogue and aWIPS** window is displayed. By default, Catalyst Center displays the **Overview** dashboard.

**Note** If a Cisco AireOS Controller does not meet the minimum software version required, a notification is displayed at the top of the dashboard. Click **Go To Devices** in the notification to upgrade to the supported version.

**Step 2** In the **Site** menu, click **Global**.

The **Site Selector** slide-in pane is displayed.

a) Enter a site name in the **Search Hierarchy** search bar or expand **Global** to choose a site.

- Note**
- If a site has more than 254 subsites, that site is disabled by default.
  - Site hierarchies that do not have floors are not listed in the site selector slide-in pane.

**Step 3** From the **Actions** drop-down list, choose **Rogue > Enable** to enable rogue subscription on the Cisco Wireless Controller and the Cisco Catalyst 9800 Series Wireless Controller.

**Step 4** Click **Yes** in the **Warning** dialog box that is displayed.

**Step 5** In the **Rogue and aWIPS Subscription** slide-in pane, do the following to enable rogue subscription:

**Note** The **Configuration Preview** tab appears only when the **Configuration Preview** is enabled. For information on how to enable configuration preview or ITSM approval, see the "Enable Visibility and Control of Configurations" topic in the *Cisco Catalyst Center Administrator Guide*.

a) Depending on the Visibility and Control of Configurations settings, choose an available option:

- **Now**: Immediately deploy the configurations.
- **Later**: Schedule the date and time and define the time zone of the deployment.
- **Generate configuration preview**: Review the configurations before deploying them.

If only visibility is enabled or both visibility and control are enabled, **Generate configuration preview** is chosen by default, and **Now** and **Later** are dimmed (unavailable). For more information, see "Visibility and Control of Device Configurations" in the *Cisco Catalyst Center User Guide*.

b) In the **Task Name** field, enter a task name.

c) Click **Apply**.

d) On the **Performing Initial Checks** window, address the following issues to continue with your current deployment:

- Pending Operations: Wait for all pending operations to deploy or discard them.
- Device Compliance: Fix, acknowledge, or ignore all issues.

If you ignore any noncompliant devices, this activity is captured on the **Audit Logs** window.

- After addressing all the issues, click **Recheck** in the bottom-right corner of the window and make sure that all the validations are successful.

For more information, see "Network Provisioning Prechecks" in the *Cisco Catalyst Center User Guide*.

If you chose **Now** or **Later**, click **Submit**, and the device configurations will deploy at the scheduled time. You can view the task on the **Tasks** window.

e) If you chose **Generate configuration preview**, depending on the Visibility and Control of Configurations settings, do the following:

1. On the **Preparing Devices and Configuration Models** window, wait for the system to prepare the devices and generate the device configurations. This can take some time, so you can click **Exit and Preview Later**. To view the work item later, go to the **Tasks** window.
2. On the **Preview Configuration** window, review the device configurations.

For more information, see "Visibility and Control of Device Configurations" in the [Cisco Catalyst Center User Guide](#).

3. Do one of the following:

- When you're ready, click **Deploy** or **Submit for Approval**.
- If you're not ready to deploy the configurations or submit them for ITSM approval, click **Exit and Preview Later**. Later, go to the **Tasks** window, open the work item, and click **Deploy** or **Submit for Approval**.

**Note** You can submit the device configurations for ITSM approval and deploy them without previewing all the configurations.

4. In the slide-in pane, indicate when you want to deploy the configuration, choose a time zone, and if visibility and control are enabled, add notes for the IT administrator.

5. Click **Submit**.

You can check the work item's approval status or the task's deployment status on the **Tasks** window. If the work item isn't approved, you need to resubmit the work item for ITSM approval. When it's approved, it's deployed at the scheduled time.

**Step 6** Choose **Rogue > Disable** to disable the rogue actions temporarily.

**Step 7** Click **Yes** in the **Warning** dialog box that is displayed.

After the rogue management functionality is disabled, data from the wireless controller will not be pushed to Catalyst Center until the rogue management functionality is enabled.

**Step 8** In the **Rogue and aWIPS Subscription** slide-in pane, do the following to disable rogue subscription:

a) Depending on the Visibility and Control of Configurations settings, choose an available option:

- **Now**: Immediately deploy the configurations.
- **Later**: Schedule the date and time and define the time zone of the deployment.
- **Generate configuration preview**: Review the configurations before deploying them.

If only visibility is enabled or both visibility and control are enabled, **Generate configuration preview** is chosen by default, and **Now** and **Later** are dimmed (unavailable). For more information, see "Visibility and Control of Device Configurations" in the [Cisco Catalyst Center User Guide](#).

b) In the **Task Name** field, enter a task name.

c) Click **Apply**.

d) On the **Performing Initial Checks** window, address the following issues to continue with your current deployment:

- Pending Operations: Wait for all pending operations to deploy or discard them.
- Device Compliance: Fix, acknowledge, or ignore all issues.

If you ignore any noncompliant devices, this activity is captured on the **Audit Logs** window.

- After addressing all the issues, click **Recheck** in the bottom-right corner of the window and make sure that all the validations are successful.

For more information, see "Network Provisioning Prechecks" in the [Cisco Catalyst Center User Guide](#).

If you chose **Now** or **Later**, click **Submit**, and the device configurations will deploy at the scheduled time. You can view the task on the **Tasks** window.

e) If you chose **Generate configuration preview**, depending on the Visibility and Control of Configurations settings, do the following:

1. On the **Preparing Devices and Configuration Models** window, wait for the system to prepare the devices and generate the device configurations. This can take some time, so you can click **Exit and Preview Later**. To view the work item later, go to the **Tasks** window.

2. On the **Preview Configuration** window, review the device configurations.

For more information, see "Visibility and Control of Device Configurations" in the [Cisco Catalyst Center User Guide](#).

3. Do one of the following:

- When you're ready, click **Deploy** or **Submit for Approval**.
- If you're not ready to deploy the configurations or submit them for ITSM approval, click **Exit and Preview Later**. Later, go to the **Tasks** window, open the work item, and click **Deploy** or **Submit for Approval**.

**Note** You can submit the device configurations for ITSM approval and deploy them without previewing all the configurations.

4. In the slide-in pane, indicate when you want to deploy the configuration, choose a time zone, and if visibility and control are enabled, add notes for the IT administrator.

5. Click **Submit**.

You can check the work item's approval status or the task's deployment status on the **Tasks** window. If the work item isn't approved, you need to resubmit the work item for ITSM approval. When it's approved, it's deployed at the scheduled time.

**Step 9** Choose **Rogue > Status** to view the rogue configuration job status.

**Step 10** Filter the rogue subscription status by **All**, **Failure**, **Success**, or **In Progress** by clicking the respective tabs.

The **Operation** column shows **Enable** if the rogue-detection operation is enabled successfully on the wireless controller.

The **Status** column shows **Success** if the subscription configuration changes are successfully pushed to the wireless controller.

**Step 11** Choose **aWIPS > Enable** to enable aWIPS data collection on Catalyst Center.

**Step 12** Click **Yes** in the **Warning** dialog box that is displayed.

**Step 13** In the **Rogue and aWIPS Subscription** slide-in pane, do the following to enable aWIPS subscription:

**Note** The **Configuration Preview** tab appears only when the **Configuration Preview** is enabled. For information on how to enable configuration preview or ITSM approval, see the "Enable Visibility and Control of Configurations" topic in the *Cisco Catalyst Center Administrator Guide*.

a) Depending on the Visibility and Control of Configurations settings, choose an available option:

- **Now**: Immediately deploy the configurations.
- **Later**: Schedule the date and time and define the time zone of the deployment.
- **Generate configuration preview**: Review the configurations before deploying them.

If only visibility is enabled or both visibility and control are enabled, **Generate configuration preview** is chosen by default, and **Now** and **Later** are dimmed (unavailable). For more information, see "Visibility and Control of Device Configurations" in the *Cisco Catalyst Center User Guide*.

- b) In the **Task Name** field, enter a task name.
- c) Click **Apply**.
- d) On the **Performing Initial Checks** window, address the following issues to continue with your current deployment:

- Pending Operations: Wait for all pending operations to deploy or discard them.
- Device Compliance: Fix, acknowledge, or ignore all issues.  
If you ignore any noncompliant devices, this activity is captured on the **Audit Logs** window.
- After addressing all the issues, click **Recheck** in the bottom-right corner of the window and make sure that all the validations are successful.

For more information, see "Network Provisioning Prechecks" in the *Cisco Catalyst Center User Guide*.

If you chose **Now** or **Later**, click **Submit**, and the device configurations will deploy at the scheduled time. You can view the task on the **Tasks** window.

- e) If you chose **Generate configuration preview**, depending on the Visibility and Control of Configurations settings, do the following:

1. On the **Preparing Devices and Configuration Models** window, wait for the system to prepare the devices and generate the device configurations. This can take some time, so you can click **Exit and Preview Later**. To view the work item later, go to the **Tasks** window.

2. On the **Preview Configuration** window, review the device configurations.

For more information, see "Visibility and Control of Device Configurations" in the *Cisco Catalyst Center User Guide*.

3. Do one of the following:

- When you're ready, click **Deploy** or **Submit for Approval**.
- If you're not ready to deploy the configurations or submit them for ITSM approval, click **Exit and Preview Later**. Later, go to the **Tasks** window, open the work item, and click **Deploy** or **Submit for Approval**.

**Note** You can submit the device configurations for ITSM approval and deploy them without previewing all the configurations.

4. In the slide-in pane, indicate when you want to deploy the configuration, choose a time zone, and if visibility and control are enabled, add notes for the IT administrator.

5. Click **Submit**.

You can check the work item's approval status or the task's deployment status on the **Tasks** window. If the work item isn't approved, you need to resubmit the work item for ITSM approval. When it's approved, it's deployed at the scheduled time.

**Step 14** Choose **aWIPS > Disable** to disable the aWIPS actions temporarily.

Click **Yes** in the **Warning** dialog box that is displayed.

**Step 15**

In the **Rogue and aWIPS Subscription** slide-in pane, do the following to disable aWIPS subscription:

- a) Depending on the Visibility and Control of Configurations settings, choose an available option:
  - **Now**: Immediately deploy the configurations.
  - **Later**: Schedule the date and time and define the time zone of the deployment.
  - **Generate configuration preview**: Review the configurations before deploying them.

If only visibility is enabled or both visibility and control are enabled, **Generate configuration preview** is chosen by default, and **Now** and **Later** are dimmed (unavailable). For more information, see "Visibility and Control of Device Configurations" in the *Cisco Catalyst Center User Guide*.
- b) In the **Task Name** field, enter a task name.
- c) Click **Apply**.
- d) On the **Performing Initial Checks** window, address the following issues to continue with your current deployment:
  - Pending Operations: Wait for all pending operations to deploy or discard them.
  - Device Compliance: Fix, acknowledge, or ignore all issues.

If you ignore any noncompliant devices, this activity is captured on the **Audit Logs** window.

  - After addressing all the issues, click **Recheck** in the bottom-right corner of the window and make sure that all the validations are successful.

For more information, see "Network Provisioning Prechecks" in the *Cisco Catalyst Center User Guide*.

If you chose **Now** or **Later**, click **Submit**, and the device configurations will deploy at the scheduled time. You can view the task on the **Tasks** window.

- e) If you chose **Generate configuration preview**, depending on the Visibility and Control of Configurations settings, do the following:
  1. On the **Preparing Devices and Configuration Models** window, wait for the system to prepare the devices and generate the device configurations. This can take some time, so you can click **Exit and Preview Later**. To view the work item later, go to the **Tasks** window.
  2. On the **Preview Configuration** window, review the device configurations.
 

For more information, see "Visibility and Control of Device Configurations" in the *Cisco Catalyst Center User Guide*.
  3. Do one of the following:
    - When you're ready, click **Deploy** or **Submit for Approval**.
    - If you're not ready to deploy the configurations or submit them for ITSM approval, click **Exit and Preview Later**. Later, go to the **Tasks** window, open the work item, and click **Deploy** or **Submit for Approval**.

**Note** You can submit the device configurations for ITSM approval and deploy them without previewing all the configurations.
  4. In the slide-in pane, indicate when you want to deploy the configuration, choose a time zone, and if visibility and control are enabled, add notes for the IT administrator.
  5. Click **Submit**.

You can check the work item's approval status or the task's deployment status on the **Tasks** window. If the work item isn't approved, you need to resubmit the work item for ITSM approval. When it's approved, it's deployed at the scheduled time.

**Step 16** Choose **aWIPS > Status** to view the aWIPS subscription status.

**Step 17** Filter the aWIPS subscription status by **All**, **Failure**, **Success**, or **In Progress** by clicking the respective tabs.

The **Operation** column shows **Enable** if the aWIPS subscription operation is enabled successfully on the wireless controller.

The **Status** column shows **Success** if the subscription configuration changes are successfully pushed to the wireless controller.

**Step 18** Use the **Threats** dashlets to display following information:

- **TOTAL ROGUE THREATS**: Displays the total number of rogue threats.
- **TOTAL AWIPS THREATS**: Displays the total number of aWIPS threats.
- **TOTAL UNIQUE ROGUE CLIENTS**: Displays the total number of unique rogue clients.
- **ROGUES CONTAINED**: Displays the total number of rogues contained.

The **Active High Threats** and **High Threats Over Time** graphs below the timeline slider display the threat details accordingly.

**Step 19** The **Active High Threats**, **Top Locations Affected**, and **High Threats Over Time** graphs display information about rogue APs detected in the last three hours by default. The graph information is based on the time interval that you choose from the **Hours** drop-down list.

- The options are **Last 3 hours**, **Last 24 hours**, and **Last 7 days**.

**Note** Choose **Custom** to select a specific time range.



**Step 20** Use the **High Threats Summary** dashlet to display the following information:

High Threats Summary Dashlet	
Item	Description
<b>Active High Threats</b>	Displays information about active threat levels in the form of a donut graph. You can filter the active high threats by <b>Top 10</b> or <b>All</b> threat types.  Click each colored slice of the donut graph to view detailed information about the threats. Hover your cursor over the graph to see the number of active high threats.  Click <b>All</b> to display the threat types and counts in a table format.
<b>Top Locations Affected</b>	Displays the top five locations affected per selected site for high threats.

**Step 21** Use the **High Threats Over Time** dashlet to display the following information:

High Threats Over Time Dashlet	
Item	Description
<b>Threats Over Time</b>	<p>Displays detailed information about high threats over time, based on the selected time period.</p> <p>Click each threat type below <b>Total Active High Threat</b>. Threat information is displayed in a graph view.</p> <p>High threat deviation is measured on a color value scale:</p> <ul style="list-style-type: none"> <li>• Green color indicates threat deviation that is less than 0.</li> <li>• Orange color indicates threat deviation from 0 to 9.</li> <li>• Red color indicates threat deviation that is more than or equal to 10.</li> </ul> <p>Hover your cursor over the graph to view the number of high threats that occurred at a particular time.</p>
<b>View Threats</b>	Click <b>View Threats</b> to view the threats table. A list of high threats is displayed.

**Step 22** Use the **Threats By Location** dashlet to view information about threats in the map view:

Location Option	
Item	Description
 <b>Map View</b>	<p>Click this toggle button to display a map view of the locations affected by threats.</p> <p>Hover your cursor over the corresponding location in the map to view all the threat levels and counts.</p>
 <b>List View</b>	Click this toggle button to display a list view of the locations affected by threats.

**Step 23** Use the **Threat Setting Summary** dashlet to view following information:

Threat Setting Summary Dashlet	
Item	Description
<b>Allowed AP List</b>	<p>Displays information about the allowed AP count and configured threat level.</p> <p>Click <b>View Details</b> to display the <b>Allowed List</b> window to view detailed information on the <b>Allowed Access Point List</b>.</p>
<b>Allowed Vendor List</b>	<p>Displays information about the allowed vendors count and configured threat level.</p> <p>Click <b>View Details</b> to display the <b>Allowed List</b> window to view information on the <b>Allowed Vendor List</b>.</p>



Threat Setting Summary Dashlet	
Item	Description
<b>Rogue Rule</b>	Displays information about a rule, its conditions type, rule profiles associated to it, and threat level.  Click <b>View Details</b> to display the <b>Rules</b> window to view detailed information on rogue rules.

**Step 24** (Optional) Use the **Tips** dashlet for a direct link to workflows such as Create Allowed AP List, Create Allowed Vendor List, Create Rogue Rule, and so on.

**Step 25** (Optional) Click **View All** to view all the available workflows.


## Monitor Network Rogue Threats

**Step 1** In the **Site** menu, click **Global**.

The **Site Selector** slide-in pane is displayed.

a) Enter a site name in the **Search Hierarchy** search bar or expand **Global** to choose a site.

- Note**
- If a site has more than 254 subsites, that site is disabled by default.
  - Site hierarchies that do not have floors are not listed in the **Site Selector** slide-in pane.


**Step 2** Click the time range setting (  ) at the top-right corner to specify the time range of the data that you want displayed in the **Threats** table:

a) From the drop-down menu, choose a time range: **3 hours**, **24 hours**, **7 days**, or **Custom**.

If you choose the **Custom** time range, specify the **Start Date** and time and the **End Date** and time.


b) Click **Apply**.

**Step 3** Use the **Threats** table to view detailed information about the threats in your network:

Threats Table	
Item	Description
 <b>Filter</b>	Click this icon at the top-right corner of the table to filter the data to be displayed in the table based on the following criteria: <b>ID</b> , <b>Threat Level</b> , <b>Threat MAC Address</b> , <b>Type</b> , <b>State</b> , <b>Connection</b> , <b>Detecting AP</b> , <b>Detecting AP Site</b> , <b>RSSI (dBm)</b> , <b>SSID</b> , <b>Clients</b> , <b>Containment Status</b> , <b>Last Reported</b> , and <b>Vendor</b> .  <b>RSSI</b> , <b>SSID</b> , and <b>Clients</b> are not displayed for aWIPS.

Threats Table	
Item	Description
Threat Table	

Threats Table	
Item	Description
	<p>Displays the following information about threats in a table format:</p> <ul style="list-style-type: none"> <li>• <b>Threat Level:</b> Displays color-coded classified threat levels. Catalyst Center classifies threats into these categories: <ul style="list-style-type: none"> <li>• <b>High Threat</b></li> <li>• <b>Potential Threat</b></li> <li>• <b>Informational</b></li> </ul> </li> <li>• <b>Mac Address:</b> Displays the MAC address of a rogue AP.</li> <li>• <b>Type:</b> Displays threat types.</li> <li>• <b>State:</b> Displays the state of a rogue AP or aWIPS attacks.</li> <li>• <b>Source/Target:</b> Shows whether the displayed MAC address is the source of an aWIPS attack or the target of an aWIPS attack. This column is not applicable for rogue data.</li> <li>• <b>Connection:</b> Displays whether the rogue AP is located on the wired network or wireless network. This column shows the aWIPS attacks on the wireless network.</li> <li>• <b>Detecting AP:</b> Displays the name of the AP that is currently detecting a rogue AP. If multiple APs detect a rogue, the detecting AP with the highest signal strength is displayed. This column is applicable for both rogue AP and aWIPS attacks.</li> <li>• <b>Detecting AP Site:</b> Displays the site location of the detecting AP. This column is applicable for both rogue AP and aWIPS attacks.</li> <li>• <b>RSSI (dBm):</b> Displays the RSSI value reported by the detecting AP. RSSI (dBm) is only applicable for rogue APs.</li> <li>• <b>SSID:</b> Displays the service set identifier that a rogue AP is broadcasting. SSID is only applicable for rogue APs.</li> <li>• <b>Clients:</b> Displays the number of rogue clients associated with an AP. This column is only applicable for rogue APs.</li> </ul> <p><b>Note</b> The client count that is displayed in the <b>Threats</b> table differs from the client count displayed in the <b>Threats 360 degrees</b> window. This happens if the data that is processed in a Catalyst Center release earlier than 2.3.2 is migrated to Catalyst Center 2.3.2 or later. Catalyst Center 2.3.2 or later displays the correct client count for the newly processed data if the time range that is selected has the new data.</p> <ul style="list-style-type: none"> <li>• <b>Containment Status:</b> Displays the possible values (<b>Contained</b>, <b>Pending</b>, <b>Open</b>, and <b>Partial</b>) of a rogue AP. For autocontained rogue APs, the status is displayed as <b>Contained (Auto)</b>, <b>Pending (Auto)</b>, <b>Open (Auto)</b> and <b>Partial (Auto)</b>. Wireless containment status is only applicable for rogue APs.</li> <li>• <b>Last Reported:</b> Displays the date, month, year, and time at which a rogue AP or aWIPS attack was last reported.</li> </ul>

Threats Table	
Item	Description
	<ul style="list-style-type: none"> <li>• <b>Vendor:</b> Displays the rogue AP vendor information. This column is not applicable for aWIPS attacks.</li> </ul>
	<p>Customize the data that you want displayed in the table:</p> <ol style="list-style-type: none"> <li>In the <b>Table Appearance</b> tab, set the table density and striping.</li> <li>In the <b>Edit Table Columns</b> tab, check the check boxes for the data that you want displayed.</li> <li>Click <b>Apply</b>.</li> </ol>

## Obtain Rogue AP and Rogue Client Details from Threat 360° View

You can quickly view the precise location details of a specific rogue AP or rogue client on a floor map, in the **Threat 360°** view.

Getting these details, however, depend on the detecting AP's strongest signal strength. With the Cisco Connected Mobile Experiences (CMX) or Cisco Spaces integration, you can get the exact location of your rogue AP or rogue client.

**Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > Threats**.

**Step 2** To launch the **Threat 360°** view for a particular rogue AP or aWIPS threat, click the corresponding row in the **Threats** table.

The **Threat 360°** pane is displayed.

The upper part of the pane displays the following information:





- **MAC address of the rogue AP**
- **Threat level**
- **Threat type**
- **Status**
- **Vendor**
- **Containment**
- **Count**
- **Last reported**

The middle part of the pane shows the estimated location of a rogue AP or a threat on the floor map:

- Site details and floor number.
- Floor map shows the names of the managed APs.









**Note** Floor Map section is not displayed for global location.










**Step 3** Perform the following tasks, as required:

- Click the  icon at the right-hand corner of the floor map to see the IP address of the wireless controller that manages the APs, along with the reachability status.
- Click the  icon at the right-hand corner of the floor map to zoom in on a location. The zoom levels depend on the resolution of an image. A high-resolution image provides more zoom levels. Each zoom level comprises a different style map that is shown at different scales, with the corresponding details. Some maps are of the same style, but on a smaller or larger scale.
- Click the  icon to see a map with fewer details.
- Click the  icon to view the details of the map icons.

The following table provides descriptions of the floor map icons.

**Table 2: Map Icons and Descriptions**

Floor Map Icon	Description
<b>Devices</b>	
	Access Point
	Sensor
	Rogue AP
	Marker
	Planned AP
	Switch
	Interferer
	Client


Floor Map Icon	Description
	Rogue Client
	Reporting AP
	Detecting AP
<b>Average Health Score</b>	
	Health score: 8-10
	Health score: 4-7
	Health score: 1-3
	Health score: Unknown
<b>AP Status</b>	
	Covered by sensor
	Not covered by sensor


**Step 4** The bottom area of the **Threat 360°** pane enables you to perform these tasks:

- Click the **Switch Port Detail** tab to get rogue-on-wire details, including **Host Mac**, **Device Name**, **Device IP**, **Interface Name**, **Last Updated**, **Port Mode**, and **Admin Status**.

- Note**
- The **Admin Status** column shows the interface status as either **UP** or **DOWN**.
  - The **Port Mode** column shows the interface mode as either **ACCESS** or **TRUNK**.

- Note** Cisco switches are required for rogue-on-wire detections.

- Click the **Detections** tab to view information such as **Detecting AP**, **Detecting AP Site**, **Adhoc**, **Rogue SSID**, **RSSI (dBm)**, **Channels**, **Radio Type**, **SNR**, **State**, and **Last Updated**.
- Click the **Filter** (  ) icon at the left end of the table to narrow down the search results based on **Rogue SSID**, **RSSI**, **Radio Type**, **Security**, and **SNR**.
- Click the **Export** icon and save it to your system.
- Click the **Clients** tab to view details such as **MAC Address**, **Gateway Mac**, **Rogue AP Mac**, **IP Address**, and **Last Heard** about the clients that are associated with the rogue AP.

- Click the **Forensic Captures** tab to view details such as **Detecting AP**, **Detecting AP Site** and **Last Updated**.
- Note** The **Forensic Captures** tab is shown only for aWIPS threats.
- Click the **Filter** (  ) icon at the left end of the table to narrow down the results based on your search criteria.

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## Download aWIPS Profile Forensic Capture from Threat 360° View

This procedure describes how to download the forensic capture of various DoS attacks from the Threat 360° view.



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**Note** Catalyst Center enables or disables forensic capture only on the default AP profile. You must enable or disable forensic capture in existing deployments where you have created custom AP join profiles.

---

### Before you begin

You must verify the network connectivity between the APs and Catalyst Center.

- 
- Step 1** From the top-left corner, click the menu icon and choose **Workflows > Rogue and aWIPS > Threats**.
- Step 2** In the **Threat MAC address** column, click the aWIPS attack link.  
The **Threat 360** window is displayed.
- Step 3** Click the **Forensic Capture** tab to view information such as **Detecting AP**, **Alarm ID**, **CaptureFilename**, and **Last Updated**.
- Step 4** In the **Capture Filename** column, click the **pcap** file to download the aWIPS profile forensic capture.
- Step 5** Click **Download All** to download all the **pcap** files.
- Step 6** Click the **Filter** icon to narrow down the search results based on **Detecting AP**.
- Step 7** Click the **Export** icon to save the **CSV** file to your workspace.

**Note** Catalyst Center shows a maximum of 50 forensic captures at a time.

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## CHAPTER 5

# aWIPS Profiles

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- [About aWIPS Profiles, on page 29](#)
- [Create an aWIPS Profile Configuration Workflow, on page 30](#)
- [View an aWIPS Profile, on page 32](#)
- [Assign an aWIPS Profile to the Network Device, on page 33](#)
- [Edit an aWIPS Profile, on page 34](#)
- [Delete an aWIPS Profile, on page 34](#)
- [Enable or Disable aWIPS or aWIPS Forensic Capture, on page 35](#)

## About aWIPS Profiles

aWIPS profile configuration allows you to select the required signatures, configure the threshold values used in the detection of aWIPS denial of service (DoS) attacks, and enable forensic capture at the signature level. Threshold configuration helps to adjust the number of alarms that are generated for a specific duration for each aWIPS signature.

aWIPS profile configuration support is available for the following devices with software version 17.4 and later:

- Cisco Catalyst 9800 Series Wireless Controller
- Cisco Catalyst 9800-CL Cloud Wireless Controller
- Cisco Embedded Wireless Controller on Catalyst Access Points
- Cisco Catalyst 9800 Embedded Wireless Controller for Catalyst 9300 Series Switches
- Cisco Catalyst 9400 Series Switches
- Cisco Catalyst 9500 Series Switches



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**Note** For SD-Access use cases only, you must enable the wireless module on Cisco Catalyst 9300 Series Switches, Cisco Catalyst 9400 Series Switches, and Cisco Catalyst 9500 Series Switches for aWIPS profiles to work.

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## Prerequisites for aWIPS Profile

- Verify the network connectivity between the Cisco Wireless Controller and Catalyst Center.
- Make sure that the network device is reachable from Catalyst Center and has downloaded the aWIPS profile configuration from Catalyst Center.
- For forensic capture to take place make sure that there is network connectivity between APs and Catalyst Center.
- For forensic capture to take place make sure that the Google Protocol RPC (gRPC) tunnel interface has been established between APs and Catalyst Center. Use the **show ap icap connection** command to make sure that the status is READY.
- For forensic capture to take place the required ports must be opened between Catalyst Center and network device links.
- For forensic capture to take place there should be no time lag between Catalyst Center and access points.
- If you have upgraded Catalyst Center from a release earlier than Release 2.2.1, you must disable and enable **aWIPS** from the **Rogue and aWIPS** dashboard to subscribe to an additional subscription. For more information, see [Monitor the Rogue Management and aWIPS Dashboard, on page 13](#).




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**Note** For a new installation of Catalyst Center, you do not have to disable and enable **aWIPS** from the **Rogue and aWIPS** dashboard to subscribe an additional subscription.

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## Create an aWIPS Profile Configuration Workflow

This section provides information about how to create an aWIPS profile.

- 
- Step 1** From the top-left corner, click the menu icon and choose **Workflows > Create an aWIPS Profile**.  
Alternatively, you can create an aWIPS profile by choosing **Assurance > Rogue and aWIPS > aWIPS Profile > Add Profile**.  
The **Create an aWIPS Profile** window is displayed.
- Step 2** Click **Let's Do it**.  
The **aWIPS Profile Creation** window is displayed.
- Step 3** In the **Profile Name** field, enter a name for the aWIPS profile.
- Step 4** The **Signatures** table lists the following aWIPS profile parameters:
- **Signature:** Shows the standard aWIPS signatures that detect the various DoS attacks.
  - **Default Threshold:** Shows the predefined threshold value for the respective aWIPS signature.
  - **Configure Threshold:** Shows the manually configured threshold value for the respective aWIPS signature.

- **Time Interval (In Seconds)**: Shows the time interval of packets.
- **Forensic Capture**: Captures the aWIPS DoS attack packets in real time for the given signature.

- Step 5** In the **Signature** column, check the check box next to the aWIPS signature that you want to select or deselect for an aWIPS profile.
- Note** If an aWIPS signature is not selected for an aWIPS profile, Catalyst Center does not detect the DoS attack for that particular aWIPS signature.
- Step 6** In the **Configure Threshold** column, for the chosen aWIPS signature, enter the threshold value within the specified range that is displayed on top of the respective **Configure Threshold** field.
- For some signatures, the configuration threshold is not applicable. The threshold configuration value for those signatures is displayed as **NA** on top of the respective **Configure Threshold** field.
- Note** The **Configure Threshold** value cannot contain alphanumeric characters.
- Step 7** In the **Forensic Capture** column, click the toggle button to enable or disable the forensic capture for a particular aWIPS signature.
- Note**
- Catalyst Center does not allow you to edit the **Default Threshold** value and the **Time Interval (In Seconds)** value for the aWIPS profile.
  - If you enable forensic capture for an aWIPS signature, Catalyst Center allows you to download packets from the **Threat 360** window.
  - If you disable forensic capture for an aWIPS signature, Catalyst Center does not capture the aWIPS DoS attack for the given signature.
  - Enabling **Forensic Capture** for RTS Flood and CTS Flood signatures might impact the performance of Catalyst Center.
- Step 8** (Optional) Click **Reset to Default** to get the default aWIPS profile configuration.
- Note** Default aWIPS profile is configured for high security environment and not suitable for general purpose deployment. Configure aWIPS profile based on your requirement.
- Step 9** Click **Next**.
- Note** In the **Configure Threshold** column, for the chosen aWIPS signature, if you enter a threshold value that is out of the specified range, an error message is displayed on top of the **Create an aWIPS Profile** window, asking you to enter a value within the specified range.
- Step 10** In the **Profile Summary** window, the **Profile Summary** table displays the summary of the profile that was configured in the **aWIPS Profile Creation** window.
- Step 11** Click **Next**.
- Step 12** In the **Profile Creation Done** window, click **Assign Profile to Device(s)** to assign this aWIPS profile to a device. The **Assign aWIPS Profile** window appears.
- You can also assign an aWIPS profile to a device in the **Assurance > Rogue and aWIPS > aWIPS Profile** window by checking the check box next to the aWIPS profile name and choosing **More Actions > Assign**.
- Note** You cannot assign more than one aWIPS profile to a device at a time.

**Step 13** In the **Assigned WLCs** column, click the number link to view the number of wireless controllers assigned to an aWIPS profile.

The **Profile Assigned to WLC** window shows the following attributes of the network device:

- **Device Name:** Shows the name of the network device.
- **IP Address:** Shows the IP address of the network device.
- **Profile Config URL Push Status:** Shows the status of the profile configuration URL push to the network device. The possible values are **Success**, **Failure**, and **In Progress**.

If the status is **Failure**, hover your cursor over the **i** icon next to **Failure** to see the reason for failure.

- **Profile Config Download Status (On Device):** Shows the profile configuration download status on the device. The possible values are **Success**, **Failure**, and **In Progress**.

If the status is **Failure**, hover your cursor over the **i** icon next to **Failure** to see the reason for failure.

- Note**
- If the aWIPS subscription is disabled on Catalyst Center, an error message appear top of the **aWIPS Profile** dashboard. You must have an aWIPS subscription to see the value of **Profile Config Download Status (On Device)**. To subscribe the aWIPS data collection, enable **aWIPS** from the **Rogue and aWIPS** overview dashboard. See [Monitor the Rogue Management and aWIPS Dashboard, on page 13](#).
  - HTTP protocol reachability must be possible between the device and Catalyst Center for the device to download the profile configuration from the profile configuration URL.

- **Forensic capture config Status:** Shows the forensic capture configuration status on the **default-ap-profile** AP Join Profile on the device. The possible values are **Success**, **Failure**, and **In Progress**.

If the status is **Failure**, hover your cursor over the **i** icon next to a **Failure** to see the reason for failure.

- **Forensic Capture:** Shows whether the forensic capture is enabled or disabled on the **default-ap-join** AP Join Profile on the device. Forensic capture on custom AP join profile is not supported.

Hover your cursor over the **i** icon next to the corresponding Forensic capture. A tooltip stating **Shows the current Forensic Capture status on default-ap-profile AP Join Profile on the device** appears.

- Note** In the **Profile Assigned to WLC** window, you cannot enable or disable **Forensic Capture**.

- **Assigned On:** Shows the date and time the aWIPS profile is assigned to the wireless controller.

**Step 14** Click **Next**.

The **Profile Creation Done** window appears.

## View an aWIPS Profile

From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > aWIPS Profile**.

The **aWIPS Profile(s)** dashboard appears.

**Note** When you navigate to the **aWIPS Profile** tab for the first time, a message appears on top of the **aWIPS Profile** dashboard, asking you to subscribe to the upgraded subscription even if **aWIPS** is enabled in Catalyst Center. To subscribe to the upgraded subscription, you must disable and enable **aWIPS** from the **Rogue and aWIPS** overview dashboard. See [Monitor the Rogue Management and aWIPS Dashboard, on page 13](#).

The aWIPS Profile dashboard displays the following information:

- **Profile Name:** Shows the list of aWIPS profiles names.
- **Assigned WLCs:** Shows the number of assigned wireless controllers to an aWIPS profile.
- **Last Changed:** Shows the last created or updated date and time of an aWIPS profile.

---

## Assign an aWIPS Profile to the Network Device

### Before you begin

If you upgrade Catalyst Center from a release earlier than Release 2.2.2.0, you must disable and enable **aWIPS** from the **Rogue and aWIPS** overview dashboard to subscribe to the additional subscription. See [Monitor the Rogue Management and aWIPS Dashboard, on page 13](#).



---

**Note** For a new installation of Catalyst Center, you do not have to disable and enable **aWIPS** from the **Rogue and aWIPS** overview dashboard to subscribe to the additional subscription.

---

- 
- Step 1** From the top-left corner, click the menu icon and choose **Workflows > Assign an aWIPS Profile**.  
The **Assign an aWIPS Profile** window appears.  
To skip this window in the future, check the **Don't show this to me again** check box.
- Step 2** Click **Let's Do it**.  
The **Assign aWIPS Profile** window appears.
- Step 3** From the **Profile Name** drop-down list, choose the aWIPS profile name that you want to assign to a device.
- Step 4** In the left pane, you can either search for a site by entering its name in the **Find Hierarchy** field, or expand **Global** to choose a site.  
You can also search for a network device by entering its name in the **Search Table** field.  
The **Network Devices** table shows the **Device Name**, **IP Address**, **Software Version**, **Reachability**, and **Forensic Capture** of the device and lists the network devices in the following sections:
- **Reachable & Supported:** Shows the list of reachable and supported network devices with software version 17.4, and reachability status with a green check mark.
  - **Not Reachable/Not Supported:** Shows the list of unreachable or unsupported network devices with software version 17.4. You cannot assign an aWIPS profile to unreachable or unsupported network devices.

**Step 5** In the **Reachable & Supported** tab, check the check box next to the device that you want to assign to the selected aWIPS profile. You can either select all the devices or an individual device.

**Note** You can assign an aWIPS profile to a maximum of 100 devices at a time.

**Step 6** Click **Next**.

**Step 7** In the **Profile and devices Mapped Summary** window, expand **aWIPS Profile Details** to view the configuration summary of the selected aWIPS profile, and **Device Map** to view the configuration summary of assigned devices.

**Step 8** Click **Next**.

The **Profile Assignment to Devices initiated successfully** window appears.

**Note** Profile assignment to the devices takes some time to complete. You must wait before retrying the assignment process.

**Step 9** To view the status of the assigned aWIPS profile to the device, click the **Go to Rogue and aWIPS Home Page** link. For more information, see [View an aWIPS Profile, on page 32](#).

---

## Edit an aWIPS Profile

This procedure describes how to edit an aWIPS profile.

### Before you begin

To subscribe the additional subscription, you must disable and enable **aWIPS** from the **Rogue and aWIPS** overview dashboard. See [Monitor the Rogue Management and aWIPS Dashboard, on page 13](#).

---

**Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > aWIPS Profile**.

**Step 2** In the **aWIPS Profile(s)** table, click the profile name that you want to edit.

**Step 3** In the **Edit aWIPS Profile** window that appears, make the necessary changes and click **Save**.

**Note** You cannot edit the default aWIPS profile.

The profile is saved and pushed to all the devices that are assigned to the given aWIPS profile.

**Note** In the **Configure Threshold** column, for the chosen aWIPS signature, if you enter a threshold value that is out of the specified range, an error message appears on the top of the **Edit aWIPS Profile** window to enter the correct value within the specified range.

---

## Delete an aWIPS Profile

This procedure describes how to delete an aWIPS profile from Catalyst Center.

### Before you begin

To subscribe the additional subscription, you must disable and enable **aWIPS** from the **Rogue and aWIPS** overview dashboard. See [Monitor the Rogue Management and aWIPS Dashboard, on page 13](#).

- 
- Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > aWIPS Profile**. The **aWIPS Profile** dashboard appears.
- Step 2** In the **aWIPS Profile(s)** table, check the check box next to the aWIPS profile name that you want to delete.
- Note**
- You cannot delete a default aWIPS profile.
  - You cannot delete an aWIPS profile that is assigned to a network device. In such a scenario, you must reassign the device to the default aWIPS profile and then delete it.
- Step 3** From the **More Actions** drop-down list, choose **Delete**.
- Step 4** In the confirmation window, click **Delete**.
- 

## Enable or Disable aWIPS or aWIPS Forensic Capture

Catalyst Center allows you to enable or disable aWIPS or aWIPS forensic capture at the site level. You can enable or disable aWIPS for all the Cisco Catalyst 9800 Wireless Controllers in a network.

- 
- Step 1** From the top-left corner, click the menu icon and choose **Design > Network Settings**.
- Step 2** Click the **Wireless** tab.
- Step 3** In the left pane, ensure that **Global** is selected.
- Note** The sites, buildings, and floors inherit the settings from the global level. The settings saved at the site, building, or floor level override the global network settings.
- Step 4** Click **AP Profiles**.
- Step 5** In the **AP Profile** table, hover your cursor over **Add**, and choose **AP Profile for IOS-XE**.
- Step 6** Click the **Security** tab.
- Step 7** To enable aWIPS, click the **aWIPS** toggle button.
- By default, **aWIPS** is enabled at the global level.
- Step 8** (Optional) To disable aWIPS, click the **aWIPS** toggle button.
- Step 9** To enable forensic capture, click the **Forensic Capture** toggle button.
- Note** To enable forensic capture, aWIPS must be enabled. If you disable aWIPS when forensic capture is enabled, forensic capture will also be disabled.
- Step 10** Click **Save**.
- Note** After you configure **aWIPS** or aWIPS Forensic Capture settings, provision or reprovision a device to push the changes to the device.

**Step 11** (Optional) To reset the **aWIPS and Forensic Capture Enablement** settings, click **Reset**.

**Note** If you are migrating from a Catalyst Center release earlier than Release 2.3.2.0, configure the network settings with **aWIPS** or **aWIPS Forensic Capture** settings so that the configurations are updated in wireless controllers.

The **aWIPS** or **aWIPS Forensic Capture** settings belong to the AP join profiles on the devices. When a Cisco Catalyst 9800 Series Wireless Controller device is provisioned, all the AP join profiles associated with the device are fetched, and the following actions take place:

- The default AP join profile inherit the **aWIPS** or **aWIPS Forensic Capture** settings from the site to which the device is assigned.
  - The custom profiles which are created using Catalyst Center as part of row AP provisioning, inherit the **aWIPS** or **aWIPS Forensic** settings from the **Country** site level for which the corresponding row AP profile is created.
  - The custom profiles created using Catalyst Center as part of mesh AP provisioning, inherit the settings from the floor site level for which the corresponding Mesh AP profile is created.
  - The custom AP join profiles created outside Catalyst Center do not inherit the settings.
-





## CHAPTER 6

# Rogue AP Containment on Wired and Wireless Networks

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- [Rogue AP Containment Overview, on page 37](#)
- [Wired Rogue AP Containment, on page 38](#)
- [Wireless Rogue AP Containment, on page 39](#)
- [Cisco Rogue AP Containment Actions Compatibility Matrix, on page 41](#)
- [View Tasks and Audit Logs of Rogue AP Containment Type, on page 42](#)

## Rogue AP Containment Overview

The Catalyst Center Rogue AP Containment feature contains the wired and wireless rogue APs. In case of wired rogue AP containment, Catalyst Center brings the **ACCESS** mode switchport interface to the **DOWN** state in which the rogue AP is attached. In case of **Wireless Rogue AP Containment**, Catalyst Center instructs the strongest detecting wireless controller to initiate containment on wireless rogue BSSIDs. The wireless controller, in turn, instructs the strongest detecting APs for those BSSIDs to stream the deauthentication packets to disrupt the communication between the rogue APs and the wireless clients of that rogue AP.

Rogue AP containment is further classified as:

- **Wired Rogue AP Containment:** The rogue AP MAC addresses classified as **Rogue on Wire** on the Catalyst Center rogue threat dashboard.
- **Wireless Rogue AP Containment:** The rogue AP MAC addresses classified as **HoneyPot**, **Interferer**, or **Neighbor** on the Catalyst Center rogue threat dashboard.

Rogue AP containment is supported on Cisco AireOS Controllers and Cisco Catalyst 9800 Series Wireless Controllers.



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**Note** Containment is not supported on aWIPS threats.

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# Wired Rogue AP Containment

The Wired Rogue AP Containment feature allows Catalyst Center to shut down the ACCESS mode interface on the switch to which a rogue AP is physically attached. Catalyst Center performs wired rogue AP containment only on ACCESS mode interfaces, because shutting down any other mode might bring the network down.

If the rogue AP is attached to non-ACCESS mode interfaces, the network admin must contain the interface either manually or through a CLI command.

This procedure describes how to perform wired rogue AP containment on an ACCESS mode interface classified as **Rogue on Wire** in Catalyst Center.

## Before you begin

Download and install the Rogue and aWIPS application package. For more information, see [Download and Install the Rogue Management and aWIPS Application Package, on page 11](#).

Ensure that you have write permission from the provision API, scheduler API, and rogue side to perform this procedure.

---

**Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > Threats**.

**Step 2** Click the rogue AP MAC address is classified as **Rogue on Wire** in the **Threat MAC address** column.

The **Threat 360** window appears.

**Step 3** From the **Action** drop-down list, choose **Shutdown Switchport**.

A warning dialog box displays the list of ACCESS mode interfaces to be shut down on the corresponding device, and **Configuration Preview** information.

**Note** The **Shutdown Switchport** option appears in the **Action** drop-down list only when the rogue AP MAC address is marked as **Rogue on Wire**. For more information, see the [Cisco Rogue AP Containment Actions Compatibility Matrix, on page 41](#).

The **Shutdown Switchport** action is irreversible. You must manually bring the switchport back up.

**Step 4** In the **Configuration Preview** tab, review the configurations and click **Yes**.

**Note** **Configuration Preview** tab appears only when **Configuration Preview** is enabled. For information on how to enable Configuration Preview, see the "Enable Visibility and Control of Configurations" topic in the *Cisco Catalyst Center Administrator Guide*.

**Step 5** The **Threat 360** window displays the wired rogue AP containment status:

- A banner with a blue check mark indicates that the wired rogue AP containment request is in progress.
- A banner with a green check mark indicates that the wired rogue AP containment is initiated successfully on the corresponding interface.
- A banner with a red check mark indicates that the wired rogue AP containment request failed.

- Note**
- After containment is initiated, it takes some time for the interface state to be updated from **Rogue on Wire** to another threat classification type.
  - The **Rogue on Wire** classification type changes to another classification type upon the arrival of the next wireless rogue message for the same rogue AP.

If a rogue AP MAC address is classified as **Rogue on Wire**, but no ACCESS mode interfaces are up to initiate the containment, Catalyst Center disables the **Shutdown Switchport** option in the **Action** drop-down list.

- Note** You cannot initiate **Wireless Rogue AP Containment** unless the rogue AP to which it corresponds to is as long as in the **Rogue on Wire** classification type. For more information, see [Wireless Rogue AP Containment, on page 39](#).

---

## Wireless Rogue AP Containment

The Wireless Rogue AP Containment feature allows Catalyst Center to contain the wireless clients connected to a rogue AP.

Containment is illegal in some countries because it disrupts the communication between the clients attached to a rogue AP. Catalyst Center warns you about the legal consequences while initiating wireless rogue AP containment.

This procedure describes how to start and stop wireless rogue AP containment on wireless clients connected to a rogue AP.

### Before you begin

Download and install the Rogue and aWIPS application package. For more information, see [Download and Install the Rogue Management and aWIPS Application Package, on page 11](#).

Ensure that you have write permission from the provision API and scheduler API to perform this procedure.

---

**Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > Threats**.

**Step 2** To perform wireless rogue AP containment, click a rogue AP MAC address listed under the **Threat MAC address** column, marked as **Honeypot**, **Interferer**, or **Neighbor** classification types.

- Note** Cisco Catalyst 9800 Series Wireless Controller has a limit of only 625 rogue containment configurations at a time. Once the limit is reached, containment won't work for any new rogues on those devices.

The **Threat 360** window is displayed.

- Note** A rogue AP MAC address comprises multiple rogue BSSIDs.

**Step 3** From the **Action** drop-down list, choose **Start Containment** and **Configuration Preview**.

A warning dialog box with information about the legal consequences and a list of rogue BSSIDs to be contained on wireless controller and **Configuration Preview** is displayed.

**Note** The **Start Containment** option appears in the **Action** drop-down list only when the rogue AP MAC address is marked as **Honeypot**, **Interferer**, or **Neighbor** classification type. For more information, see the [Cisco Rogue AP Containment Actions Compatibility Matrix](#).

**Step 4** By default, the **Rogue BSSID** list is displayed.

In the **Configuration Preview** tab, review the configurations and click **Yes**.

**Note** The **Configuration Preview** tab is displayed only when the **Configuration Preview** is enabled. For information on how to enable **Configuration Preview**, see the "Enable Visibility and Control of Configurations" topic in the *Cisco Catalyst Center Administrator Guide*.

**Step 5** The **Threat 360** window displays the wired rogue AP containment status as follows:

- Banner with a blue check mark indicates that the wireless rogue AP containment request is in progress.
- Banner with a green check mark indicates that the wireless rogue AP containment request is submitted successfully to the strongest detecting AP. A red vertical line appears next to the strongest detecting AP based on the RSSI value.
- Banner with a red check mark indicates that the wireless rogue AP containment request has failed.

**Note** After containment is initiated, it takes some time for the **Containment Status** column to get update with another wireless containment status.

In the **Threat 360** window, hover your cursor over the **i** icon next to the **Containment** column. A tooltip stating **This always shows current Wireless Containment Status** is displayed.

**Step 6** Catalyst Center allows you to monitor the **Containment Status** of a wireless rogue AP in the **Rogue and aWIPS** dashboard threat table within Assurance.

Hover your cursor over the **i** icon adjacent to the **Containment Status** column to view the following possible values.

**Table 3: Wireless Containment Status Possible Values**

Wireless Containment Status	Meaning
<b>Contained</b>	Rogue AP actively contained by the wireless controller.
<b>Pending</b>	Wireless controller has kept this rogue in containment Pending state.
<b>Open</b>	Rogue AP is not contained.
<b>Partial</b>	Some of the rogue BSSIDs are in Open state and the rest of them are either in the <b>Contained</b> or the <b>Containment Pending</b> state.

**Note** For a rogue AP with wireless containment status as **Partial**, an **i** icon appears adjacent to **Partial** state under the **Containment** column in the **Threat 360** window. Hover your cursor over the **i** icon to view the current wireless containment status of the **Rogue SSIDs**.

The wireless controller can keep the wireless rogue AP containment in **Pending** state because of the following reasons:

- **Resource outage:** After the rogue BSSID containment request is submitted, the wireless controller puts the rogue BSSID containment either in **Containment** or **Containment Pending** state because of the three rogue BSSIDs per radio limitation for client-serving radios, and six rogue BSSIDs per radio limitation for monitor mode. When the

radio exceeds the specified limitation, the next submitted rogue BSSID for containment goes to the **Pending** state by the wireless controller until one of the rogue BSSIDs goes out of **Contained** state.

- **Protected Management Frames (PMF)**: The wireless controller does not initiate containment as long as the Protected Management Frames (PMF) are enabled on rogue BSSIDs and the containment status in **Pending** state. When the PMF is disabled, the wireless controller initiates the containment.
- **Dynamic Frequency Selection (DFS)**: The wireless controller keeps the containment status in Pending state and does not attempt to contain the rogue BSSID if it broadcasts on the Dynamic Frequency Selection (DFS) channels. After the rogue BSSID moves out of the DFS channel, the wireless controller initiates the containment.

**Step 7** To bring back all the rogue BSSIDs of the wireless rogue AP marked in **Contained**, **Pending** or **Partial** state to **Open** state, click the corresponding rogue AP MAC address listed under the **Threat MAC address** column.

The **Threat 360** window appears.

**Step 8** From the **Action** drop-down list, choose **Stop Containment**.

**Note** The **Stop Containment** option appears in the **Action** drop-down list only when wireless rogue AP is in **Contained**, **Pending** or **Partial** state. For more information, see the [Cisco Rogue AP Containment Actions Compatibility Matrix, on page 41](#).

- A blue check mark is displayed as a banner on the **Threat 360** window, indicating the progress of the **Stop Containment** process on the wireless rogue AP.
- A green check mark is displayed as a banner on the **Threat 360** window, indicating the progress of the **Stop Containment** process on the wireless rogue AP.

## Cisco Rogue AP Containment Actions Compatibility Matrix

The following table shows the behavior of rogue AP containment actions for the current state of rogue APs on the **Threat 360** window.

**Table 4: Rogue AP Containment Actions Compatibility Matrix**

Rogue AP Threat Type	Rogue AP Current Containment State	Start Containment Option in Actions Drop-Down List	Stop Containment Option in Actions Drop-Down List
Beacon Wrong Channel	Open	Disabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled
Beacon DS Attack	Open	Disabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled
AP Impersonation	Open	Disabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled

## View Tasks and Audit Logs of Rogue AP Containment Type

Rogue on Wire	Open/Contained/Pending/Partial	Not Visible <b>Shutdown Switchport</b> is shown	Not Visible <b>Shutdown Switchport</b> is shown
Allowed List	Open	Disabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled
Honeypot	Open	Enabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled
Interferer	Open	Enabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled
Friendly	Open	Disabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled
Neighbor	Open	Enabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled
Custom Rule (High, Potential)	Open	Enabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled
Custom Rule (Informational)	Open	Disabled	Disabled
	Contained/Pending/Partial	Disabled	Enabled

## View Tasks and Audit Logs of Rogue AP Containment Type

In case of containment failure, Catalyst Center allows you to view the tasks and audit logs of submitted requests of wired and wireless rogue AP containment.

- 
- Step 1** From the top-left corner, click the menu icon and choose **Activities > Tasks**.
- Step 2** In the left pane, under **Type**, click **Task** to view only tasks.
- Step 3** In the left pane, do the following to view only wired and wireless rogue AP containment tasks:
- Expand **Categories**.
  - Click **Show all**.
  - In the **Search** field, enter **ROGUE**.
  - Check the **ROGUE** check box.
- Step 4** Click the task name to open a slide-in pane with more information, such as the rogue AP containment operation details, status, date, and time.

**Step 5** To view the audit logs with the rogue AP containment type and corresponding device IP address information, click the menu icon and choose **Activities > Audit Logs**.

**Note**

- For Cisco AireOS, the containment request audit logs show the CLI commands.
  - For Cisco Catalyst 9800 Series Wireless Controllers, the containment request audit logs show the NETCONF requests.
  - For **Wired Rogue AP containment**, the audit logs show the CLI commands executed on the switch to bring the switchport down.
-







## CHAPTER 7

# Custom Classification of Rogue APs

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- [Set Up the Allowed List Workflow, on page 46](#)
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## About the Allowed List Workflow

The Catalyst Center Rogue Management and aWIPS workflow allows you to review and mark the MAC address of rogue access points that you want to move to the allowed list in bulk, and process the bulk allowed list of selected AP MAC addresses.

The Rogue Management and aWIPS workflow supports APs that are associated with Cisco AireOS Controllers and Cisco Catalyst 9800 Series Wireless Controllers.

You can move the following rogue AP types to the allowed list using the information provided in [Set Up the Allowed List Workflow, on page 46](#):

- Rogue on Wire
- Honeypot
- Interferer
- Neighbor

You cannot move the following rogue AP types to the allowed list:

- Beacon Wrong Channel
- Beacon DS Attack
- AP Impersonation
- Friendly

## Set Up the Allowed List Workflow

This procedure shows how to move rogue AP MAC addresses to the allowed list in bulk. These addresses are the ones that you do not want to report as high threat in Catalyst Center.

### Before you begin

To perform the following task, you must have SUPER-ADMIN-ROLE or NETWORK-ADMIN-ROLE permissions.

- 
- Step 1** From the top-left corner, click the menu icon and choose **Workflows > Set up Rogue Management and aWIPS**. The **Set up Rogue Management and aWIPS** window is displayed.
- Step 2** Click **Let's Do it**.  
To skip this step in the future, check the **Don't show this to me again** check box.  
The **Bulk upload allowed access points** window is displayed.
- Step 3** Using the **Search** field, search for the MAC addresses that were already added in the [About the Allowed List Workflow, on page 45](#).
- Step 4** Click **Export** to export the allowed list.
- Step 5** Click the **Download the sample CSV template from here** link to download the sample CSV template file and manually add the MAC address, operation, and category to create the bulk allowed list template.  
Hover your cursor over the notification symbol to view the format of allowed MAC addresses, operations, and categories.
- Step 6** You can either drag and drop the CSV file into the boxed area or click **Choose a file** and browse to the CSV file on your system. The maximum size of the CSV file should be 1.2 MB.
- Note** Catalyst Center performs a validation check. An error message is displayed if the uploaded CSV file does not meet the following requirements:
- The MAC address is not a valid rogue point MAC address.
  - All the rogue access point MAC addresses exist in the system already, or no rogue access point MAC addresses are eligible for the delete operation.
  - A green check mark indicates that the uploaded CSV file content is valid.
- Step 7** Click **Next**.

- Step 8** In the **Summary** window, the **Uploaded bulk allowed list MAC addresses** table displays the list of allowed MAC addresses in bulk, and the respective operation and action:
- **All**: Shows the list of all the MAC addresses in bulk, and their respective operation and action.
  - **Create**: Shows the list of created MAC addresses in bulk, and their respective operation and action.
  - **Delete**: Shows the list of deleted MAC addresses in bulk, and their respective operation and action.
  - **No Action**: Shows the list of MAC addresses that are already deleted, and their respective operation and action.
- Step 9** Click **Continue to allowed list**, and, in the dialog box that is displayed, click **Yes**.  
The **Done! Allowed List Updated** window appears.
- Step 10** Click **Go to Rogue and aWIPS Home Page**.  
The **Rogue and aWIPS** dashboard is displayed.  
Click the **Threats** tab, that displays **Threat** table, Catalyst Center now categorizes the specified rogue AP MAC addresses as **Allowed List** under the **Type** column.
- Step 11** To add or delete a rogue AP MAC address individually, click the rogue MAC address listed under the **Threat MAC address** column.  
The **Threat 360** window is displayed.
- Step 12** From the **Action** drop-down list, choose **Add to Allowed list**.  
To remove a rogue AP MAC address from the allowed list individually, from the **Action** drop-down list, choose **Remove from Allowed list**.

---

## About Custom Rogue Rule Creation

Rogue rules are an easy way to segregate and manage rogues with different risk profiles. Rogue rules are easy to configure and they are applied in order of priority. They reduce false positives, noise for sites with interferers, number of alerts, and provide the ability to adjust organizational risk profiles on global and site basis.

You can move the following rogue AP types to the custom classification type:

- Interferer
- Neighbor

## Edit a Rogue Rule

- 
- Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > Rules**.
- Step 2** In the **Rogue Rules** table, click the rule name that you want to edit.
- Step 3** On the **Edit Rogue Rule** window, make changes, if any.

**Note** The previous classification, based on old rules, is not modified even if the rule conditions are modified. The change affects only the new data classification.

**Step 4** (Optional) Check the **Enable Auto-Containment** check box to autocontain the rogue rule.

**Note**

- Cisco Catalyst 9800 Series Wireless Controllers have a limit of 625 Rogue Containment configurations at a time. Once the limit is reached, containment won't work for any new rogue on those devices.
- You can only autocontain **Honeypot** and the custom rule with the **High** level threat.
- If you want to disable autocontainment after enabling autocontainment, you must disable autocontainment manually because it cannot be disabled automatically.

**Step 5** Click **Save**.

Verify whether the rogue containment is enabled or not in the **Auto-Containment** column.

## Delete a Rogue Rule

**Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > Rules**.

**Step 2** In the **Rogue Rules** table, click the **Rule Name** that you want to delete and click **Delete**.

**Note** If you delete the only rogue rule in a rule profile, the rule profile is also deleted.

**Step 3** In the confirmation dialog box, click **Delete**.

**Note** **Honeypot** is a predefined rule; you cannot delete it.

**Step 4** (Optional) To view the deleted rules, click the **Inactive** tab in the **Rogue Rules** table.

## Create a Custom Rogue Rule

You can create a rule with specific conditions and associate this rule to a rule profile.

**Step 1** From the top-left corner, click the menu icon and choose **Workflows > Create a Rogue Rule**.

**Step 2** In the **Create a Rogue Rule** window, click **Get Started**.

**Step 3** In the **Rule Name** field, enter a unique name for the rule.

While creating new rogue rules, you cannot enter the rogue rule names that were deleted earlier.

**Step 4** In the **Description** field, enter a description for the rule.

**Step 5** Click **Next**.

**Step 6** In the **Create Rogue Rule** window, choose one of the following threat level options: **High**, **Potential**, and **Informational**.

- Step 7** (Optional) Check the **Enable Auto-Containment** check box to autocontain the rogue rule.
- Note**
- Cisco Catalyst 9800 Series Wireless Controllers have a limit of only 625 Rogue Containment configurations at a time. Once the limit is reached, containment won't work for any new rogue on those devices.
  - Autocontainment is only applicable to the rogue rules classified with the **High** threat level. By default, **Enable Auto-containment** is disabled for the **Potential** and **Informational** threat levels.
- Step 8** From the **Match** drop-down list, choose either **All** to match all the conditions, or **Any** to match your choice of conditions.
- Step 9** From the **Add Condition** drop-down list, choose the rule conditions.
- You can add multiple conditions to a rule. The available rule conditions are: **SSID**, **RSSI**, **Encryption Condition**, and **Minimum Rogue Client Count**.
- Step 10** Click **Next**.
- Step 11** (Optional) To assign this rule to an existing rule profile, click **Yes** in the **Do you want to assign this rule to a rule profile?** dialog box.
- Note** Creating only rogue rules will not work as an entity. Rogue rules must be assigned to a rule profile.
- Step 12** In the **Available rule profiles** table, check the check box next to the corresponding profile name, and click **Next**.
- You can select one or more rule profiles.
- Note** You cannot assign more than five rules to a rule profile.
- Step 13** In the confirmation dialog box, click **Proceed**.
- The new rule is set to the lowest priority. You can edit the rule profile to change the priority.
- Note** After the rogue rule is created, you cannot use the same rogue rule name to create another rogue rule.
- Step 14** Review the rogue rule configuration in the **Summary** window.
- Note** Previous classification based on old rules is not modified even if the new rule conditions match. The change affects only the new data classification.
- Step 15** (Optional) To create another rogue rule, click the **Create Another Rogue Rule** button and repeat the preceding steps in this procedure.
- Step 16** (Optional) To view the created rogue rules, click **View all Rogue Rules and Profiles**.
- The **Rogue Rules** tab lists all the rogue rules that have been created.
- You can also view the created rogue rules by clicking the menu icon and choosing **Assurance > Rogue and aWIPS > Rules > Rogue Rules**.
- 

## About Rogue Rule Profiles

You can create a rogue rule with specific conditions, and then associate it to a rule profile. You can prioritize rogue rules after associating them to a rogue rule profile.

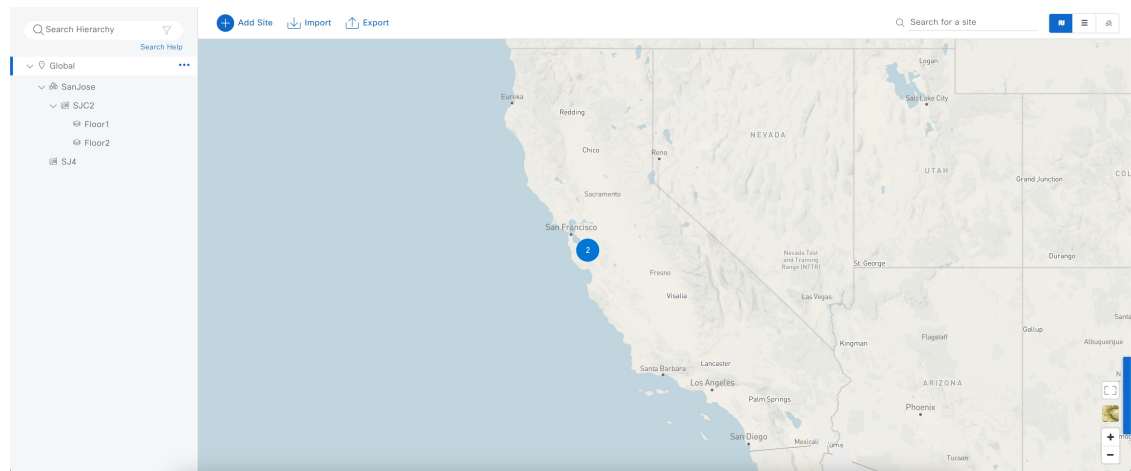
When a rogue rule profile is assigned to a site, the rogues reported from the site are verified against the rules in the rule profile.

Note that you can assign only one rogue rule profile to a site.

Because of site inheritance, all the floors under a particular site inherit the rogue rule profile that is mapped at the area, site, or building level. For example, as shown in the following figure, **Floor1** and **Floor2** will inherit the rogue rule profile that is mapped at the **SanJose** level.

A rogue rule profile mapped to a floor has precedence over a rogue rule inherited from a parent site. For example, as shown in the following figure, Rogue Rule Profile A is directly mapped to **Floor1**. Rogue Rule Profile A takes precedence over Rule Profile B that is assigned to the parent site, **SJC2**.

**Figure 1: Network Hierarchy**



## Edit a Rogue Rule Profile

**Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > Rules**.

**Step 2** Click the **Rogue Rule Profiles** tab.

**Step 3** In the **Rogue Rule Profiles** table, click the profile name that you want to edit.

**Step 4** In the **Edit Rule Profile** window, make the necessary changes.

**Note** Edited rule profiles do not modify any previously classified data. The edits only apply to the new modified data that is processed after changes are made.

**Step 5** (Optional) Check the **Enable Auto-Containment** check box to autocontain the rogue rule.

**Note**

- Cisco Catalyst 9800 Series Wireless Controllers have a limit of 625 Rogue Containment configurations at a time. Once the limit is reached, containment won't work for any new rogue on those devices.
- **Honeypot** is a predefined rule that is added to all the newly created rogue rule profiles by default.
- If you want to disable autocontainment after enabling autocontainment, you must disable autocontainment manually because it cannot be disabled automatically.

- Step 6** In the confirmation window, click **Yes**.
- Step 7** (Optional) You can toggle between **User Defined** and **Predefined** to view the corresponding rules.
- Step 8** Verify whether the rogue containment is enabled or not in the **Auto-containment** column.
- Step 9** Click **Save**.
- 

## Delete a Rogue Rule Profile

---

- Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS > Rules**.
- Step 2** Click the **Rogue Rule Profiles** tab.
- Step 3** In the **Rogue Rules** table, click the profile name that you want to delete and click **Delete**.
- Step 4** In the confirmation dialog box, click **Delete**.
- 

## Create a Rogue Rule Profile

You can create a rule with specific conditions and then associate it to a rogue rule profile.

---

- Step 1** From the top-left corner, click the menu icon and choose **Workflows > Create a Rogue Rule Profile**.
- Step 2** In the **Create Rogue Rule Profile** window, click **Get Started**.
- Step 3** In the **Profile Name** field, enter a unique name for the rule profile.
- Step 4** (Optional) Check the **Enable Auto-Containment** check box to autocontain the rogue rule.
- Note**
- Cisco Catalyst 9800 Series Wireless Controllers have a limit of 625 Rogue Containment configurations at a time. When the limit is reached, containment won't work for any new rogues on those devices.
  - You can only autocontain **Honeypot** and the custom rules classified with the **High** threat level.
- Step 5** In the confirmation window, click **Yes**.
- Step 6** Click **Next**.
- Step 7** In the **Rule List** table, check the check box next to the rule name, and click **Next**.
- You can add up to five rogue rules in a profile.
- Step 8** In the **Sort rules in order of priority** window, drag and drop a rule into the desired priority with the highest priority on top to reorder rules based on your priority.
- Step 9** Click **Next** to associate a rogue rule profile to a location.
- Step 10** Check the check box next to a site to associate the rule profile to that site, and click **Next**.
- Rule profiles can exist without being assigned to any site. Rules aren't checked unless the rule profile is assigned to a site.
- Note** If a vendor rule and rule profile are mapped to the same site, the vendor rule takes precedence.

- Step 11** In the **Summary** window, review the rogue rule profile configuration.
- Step 12** Click the **Back** button to make changes, if any, to the values entered in the previous window.
- Step 13** Click **Create Rule Profile**.  
A message is displayed, stating that the rule profile is created successfully.
- Step 14** (Optional) To view all the rogue rules and profiles, click **View all Rogue Rules and Profiles**.  
The **Rogue Rule Profiles** tab lists all the created rogue rules and rule profiles.  
You can also view the created rule profiles by clicking the menu icon and choosing **Assurance > Rogue and aWIPS > Rules > Rogue Rule Profiles**.
- 

## View the Allowed Access Points List

---

- Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS**.  
The **Rogue and aWIPS** dashboard is displayed.
- Step 2** In the **Allowed List** tab, click the **Allowed Access Points List**.  
The **Allowed Access Points List** table shows the **MAC Address** and **Last Changed** details of all the allowed access points.
- Step 3** Click the search or filter icon to find a particular access point in Allowed list.
- Step 4** (Optional) Click **Add Access Point List** to add a rogue AP MAC address to the allowed list. For more information, see [Set Up the Allowed List Workflow, on page 46](#).
- Step 5** (Optional) Click **Export** to export the allowed access points list to a CSV file.
- Step 6** (Optional) Select an access point and click **Delete** to remove the access point from the Allowed list.
- 

## About the Allowed Vendor List

With the **Allowed Vendor List** feature, you can define whether APs from specific vendors will trigger a specific threat level. You can create a list of allowed vendors, so that threats from these vendors are not marked as **High** threats. You can decide whether they need to be marked as **Potential** or **Informational** threats. In a given workflow, you can add up to five vendors to the allowed list.

An allowed vendor rule that is mapped at any level takes precedence over the inherited rule. For example, if allowed vendor rule A is mapped to a floor level, vendor rule A takes precedence over allowed vendor rule B that is present at the site, area, or building level.



## View Vendor Rule List Information

---

- Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS**.
- Step 2** Click the **Allowed List** tab.  
The **Allowed Vendor List** table shows the list of allowed vendors with the following details. Each vendor rule is displayed as an entity:
- **Vendor Name**
  - **Match Criteria**
  - **Threat Level**
  - **Associated Site(s)**
  - **Last Changed**
- 

## Edit a Vendor Rule

---

- Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS**.
- Step 2** Click the **Allowed List** tab.
- Step 3** In the **Allowed Vendor List** table, click the vendor name that you want to edit.
- Step 4** In the **Edit Allowed Vendor List** window, edit the following parameters, as necessary:
- **Threat Level**
  - **Match Criteria**
  - **Vendor Name**
  - **Associated Sites**
- Step 5** Click **Save**.
- 

## Delete a Vendor Rule

---

- Step 1** From the top-left corner, click the menu icon and choose **Assurance > Rogue and aWIPS**.
- Step 2** Click the **Allowed List** tab.
- Step 3** In the **Allowed Vendor List** table, check the check box of the vendor name that you want to delete, and click **Delete**.

**Step 4** At the prompt, click **Delete**.

---

## Create a List of Allowed Vendors

You can create a list of vendors to be on the allowed list, so that threats from these vendors are not marked as **High** threats.

You can add five vendors in a single workflow for a set of sites.

---

- Step 1** From the top-left corner, click the menu icon and choose **Workflows > Create Allowed Vendor List**.  
You can also create a list of allowed vendors by clicking the menu icon and choosing **Assurance > Rogue and aWIPS > Allowed List**.
- Step 2** In the **Create Allowed Vendor List** window, click **Let's Do it**.  
To skip this window in the future, check the **Don't show this to me again** check box.  
The **Create Allowed Vendor List** window appears.
- Step 3** From the **Selection Criteria** drop-down list, choose a selection criteria (**Exactly Matches** or **Contains**) for the vendor name.
- Step 4** In the **Vendor Name** field, enter the vendor name.  
The vendor name match is case-sensitive.
- Step 5** Click **+** to add another vendor to the allowed list.  
In a given workflow, you can add a maximum of five vendors to the allowed list.
- Step 6** In the **Site Selection** window, check the check box next to the site to which you want to apply your allowed vendor list.  
Because of site inheritance, all the floors under a particular site inherit the vendor rule that is mapped to the area, site, or building level.
- Step 7** Click **Next**.
- Step 8** In the **Summary** window, view the details about the allowed vendor and site selection.
- Step 9** Click **Done**.  
The **Allowed Vendor List Created** window appears.
- Step 10** (Optional) To create another allowed vendor list, click **Create New Allowed Vendor List** and repeat Step 3 to Step 8.
- Step 11** (Optional) To view the created vendor lists, click **View all allowed Lists**.
-



## CHAPTER 8

# Rogue and aWIPS Event Notifications

- [Information About the Rogue and aWIPS Event Notifications, on page 55](#)

## Information About the Rogue and aWIPS Event Notifications

You can configure Catalyst Center to send a notification whenever a rogue or aWIPS attack takes place. These events will not be logged in the Catalyst Center Notification Center. If an event occurs after you have subscribed to Rogue Threats or aWIPS threats, you can receive notifications through REST APIs (Webhook, PagerDuty, and Webex) or a syslog server.

- See the “Work with Events” topic in the [Cisco Catalyst Center Platform User Guide](#) to configure the Webhook and syslog destinations.
- See the “Catalyst Center to PagerDuty Integration” topic in the [Catalyst Center ITSM Integration Guide](#) to configure the PagerDuty destination.
- See the “Catalyst Center to Cisco WebEx Integration” topic in the [Catalyst Center ITSM Integration Guide](#) to configure the Webex destination.

When completing this procedure, ensure that you select and subscribe to a rogue or aWIPS event.

To subscribe to a rogue or aWIPS event in the Catalyst Center GUI, click the menu icon and choose **Platform > Developer Toolkit > Events**.



**Note** You will receive event notifications only after subscription to a rogue or aWIPS event. For threats that occurred before this subscription, in the Catalyst Center GUI, click the menu icon and choose **Reports > Report Templates > Rogue and aWIPS**.

Webex and PagerDuty destinations have limits of 100 event notifications every 5 minutes. If you will receive more than 100 events in 5 minutes, configure Webhook or syslog destinations.

## Rogue Events

Rogue events are triggered only for the following High threat-level rogues:

- Beacon Wrong Channel

- Beacon DS Attack
- AP Impersonation
- Rogue on Wire
- Honeypot
- Custom Rules created with Threat Level as High

Rogue events are triggered when:

- A high threat-level rogue is discovered in the network for the first time (ROGUE\_NEW\_THREAT\_DETECTED)
- A high threat-level rogue is deleted from the network (ROGUE\_THREAT\_DELETED)
- Threat level is changed from **High** to **Potential** or **Informational** (ROGUE\_THREAT\_LEVEL\_CHANGED)
- Threat level is changed from **Potential** or **Informational** to **High** (ROGUE\_THREAT\_LEVEL\_CHANGED)
- Threat level remains **High** but threat type changes (ROGUE\_THREAT\_TYPE\_CHANGED)

#### Rogue Events Payload Details:

```
{
  "detectingApLocation": "string",
  "rssi": "int",
  "threatMacAddress": "string",
  "threatType": "string",
  "detectingApMacAddress": "string",
  "threatState": "string",
  "wlcIp": "string",
  "detectingApName": "string",
  "containmentState": "string",
  "vendorName": "string",
  "ssid": "string",
  "threatLevel": "string"
}
```

#### Commands in Payload:

- threatMacAddress: MAC address of the rogue AP
- threatType: Type of rogue threat (Beacon DS Attack, AP Impersonation, Rogue on Wire, Honeypot, or Custom Rules created with Threat Level as High)
- threatState: State of the rogue threat (ROGUE\_NEW\_THREAT\_DETECTED, ROGUE\_THREAT\_DELETED, ROGUE\_THREAT\_LEVEL\_CHANGED, ROGUE\_THREAT\_LEVEL\_CHANGED, or ROGUE\_THREAT\_TYPE\_CHANGED)
- threatLevel: State of the rogue (High, Potential, or Informational)
- detectingApName: Name of the strongest detecting AP
- detectingApMacAddress: MAC address of the strongest detecting AP
- detectingApLocation: Location of the strongest detecting AP
- rssi: RSSI value of the detecting AP that detects the rogue AP
- containmentState: Containment state of the rogue AP (**PENDING**, **NOTCONTAINED**, or **CONTAINED**)

- **threatVendorName**: Vendor name of the rogue AP
- **ssid**: Latest SSID or Honeypot SSID
- **wlcIp**: IP address of the wireless controller

## aWIPS Events

aWIPS events are triggered for all aWIPS threats in the network.

Notification is sent for each detecting AP. If multiple APs detect the same threat, you will receive multiple event notifications.




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**Note** The maximum aWIPS threat notification limit per signature per day is 2500. Once the notifications of a particular signature reach this limit, no more notifications will be sent for that signature for that day. A warning message is displayed on the Rogue and aWIPS **Overview** window.

Click **View Signatures** to view the details of aWIPS signatures that have reached the maximum limit.

---

For source-based aWIPS threats, source information will be sent. Destination information will be sent as Not Applicable.

For destination-based aWIPS threats, destination information will be sent. Source information will be sent as Not Applicable.

For pair-based aWIPS threats, both source and destination information will be sent.

### aWIPS Events Payload Details:

```
{
  "sourceVendorName": "string",
  "detectingApLocation": "string",
  "attackType": "string",
  "sourceMacAddress": "string",
  "detectingApMacAddress": "string",
  "wlcIp": "string",
  "detectingApName": "string",
  "targetMacAddress": "string"
}
```

### Commands in Payload:

- **attackType**: Type of the aWIPS attack
- **sourceMacAddress**: MAC address of the attacker
- **sourceVendorName**: Vendor name of the attacker
- **targetMacAddress**: MAC address of the target
- **detectingApLocation**: Location of the detecting AP
- **detectingApMacAddress**: MAC address of the detecting AP
- **detectingApName**: Name of the detecting AP
- **wlcIp**: IP address of the wireless controller

