



# Spectrum Analysis

- [Information About Spectrum Analysis, on page 1](#)
- [Live Spectrum Analysis, on page 2](#)
- [Performing AP Spectrum Analysis \(GUI\), on page 2](#)
- [Configuring Spectrum Analysis, on page 3](#)
- [Verifying Spectrum Analysis, on page 3](#)

## Information About Spectrum Analysis

Cisco Catalyst Center receives a spectrogram stream from access points and visualizes spectrum analysis as a real-time spectrogram view. Network administrators receive RF violation issues from end users or radio frequency issue from the Catalyst Center. To analyze a violation, you should select the corresponding AP and analyze the spectrogram stream.

Based on whether a setting is global or is meant for a specific channel, every AP uses a specific channel to communicate with clients.

When a lot of clients join on the same AP, there is a high possibility of frames getting dropped off. When there is an issue of clients dropping quickly, or not getting onboarded, you should perform the spectrum analysis to check if the channels are clogged.

You can enable spectrum analysis on every AP listed in the web UI and view the graphs based on the corresponding AP. When enabled, the APs send spectrum data to Catalyst Center which then aggregates it into 3 distinct charts.

You can view the following charts while performing a spectrum analysis:

- **Persistence Charts:** Plot the amplitude-to-power ratio of each signal at each channel for a period of five minutes. The chart is color coded with blue color representing one signal and red representing many signals. This chart also plots the opacity that represents the age of the signal data within the five minute interval, with older data being more transparent.
- **Waterfall Charts:** Plot all the signals that are analyzed in the channel for a period of five minutes with intensity on X axis, and with time represented in the Y axis. The chart is color coded, with blue color representing a low value and red representing a high value.
- **Interference and Duty Charts:** Plot the severity of detected interference for each channel band, and list the interference type. Interference is plotted as a circle, where the center represents the severity, and the radius represents the section of the channel band that is affected. The impact of the interference is measured

as severity, with values ranging from 0 to 100. The interference type is determined from RF signature identified by Cisco CleanAir technology of the interference.

## Live Spectrum Analysis

You can perform a live spectrum analysis of the AP radios, and monitor the spectrum of frequencies generated by the radios of the corresponding AP using the web UI. The live spectrum capture uses radio 2 if it is available. Otherwise, both radio 0 and radio 1 are used. When you enable live spectrum analysis on radio 2, Cisco Catalyst Center displays a consolidated view of the interference in both the 2.4 Ghz and 5 Ghz range. However, if the feature is enabled on radio 0 or radio 1, you can only view the part of the spectrum that the radios are associated with. You can select a radio in the web UI and view a live spectrum associated with this radio, for 10 minutes, and later extend the duration based on your requirement.

## Performing AP Spectrum Analysis (GUI)

### Before you begin

Use the Cisco Catalyst Center Discovery functionality to locate an AP to perform a spectrum analysis. .

### Procedure

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- Step 1** Choose **Provision > Inventory**.
- The **Inventory** window is displayed.
- Step 2** Click **AP Name** .
- The **360 degree Device** window is displayed.
- Step 3** Click **Intelligent Capture** .
- Step 4** Click **Spectrum Analysis** to view the graphs.
- Step 5** From the **Radio** drop-down list, choose a radio.
- Step 6** Click **Start Spectrum Analysis** .
- The graphs are displayed on the web UI for you to analyze.
- To stop the analysis, click **Stop Spectrum Analysis**.
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# Configuring Spectrum Analysis

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>icap subscription ap rf spectrum enable</b>  <b>Example:</b> Device# icap subscription ap rf spectrum enable	Configures spectrum analysis on the AP.
<b>Step 3</b>	<b>icap subscription ap rf spectrum slotnumber</b>  <b>Example:</b> Device# icap subscription ap rf spectrum slot 0	Selects a radio slot to enable spectrum analysis.

## Verifying Spectrum Analysis

The following is a sample output of the **show ap icap subscription name** command that verifies spectrum analysis on a selected AP:

```
Device#show ap icap subscription name
Subscription list
-----
Full Pkt Capture : Disabled
Partial Pkt Capture : Enabled
Anomaly Event : Enabled
Debug : Disabled
Stats : Disabled
Ap Operational Data : Disabled
Sensor Message : Enabled
RRM Operational Data : Disabled
Client Events : Disabled
aWIPS Forensic Pkts: Disabled

MAC and Filters subscription list
-----
Full-packet-trace: None
Partial-packet-trace: None
Filters: None
Anomaly Detection: None

Client Stats
-----
None

RF Spectrum
```

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Radio Slot(s) : 1