Spectrum Intelligence

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Spectrum Intelligence

A spectrum intelligence feature is a radio analysis tool that

- scans 2.4-GHz and 5-GHz bands for non-Wi-Fi radio interference
- detects and classifies interference types such as microwave, continuous wave (like video bridge and baby monitor), Wi-Fi, and frequency hopping (Bluetooth and frequency-hopping spread spectrum (FHSS) cordless phone), and
- provides detailed radio utilization, noise, air quality, and interference reports for compatible Cisco APs.

For information about APs that support this feature, see the relevant documentation. https://www.cisco.com/c/en/us/td/docs/wireless/access_point/feature-matrix/ap-feature-matrix.html.

Note You must enable the Spectrum Intelligence feature on Cisco Aironet 1832 and 1852 series APs to view radio details such as noise, air quality, interference, and radio utilization in Cisco Catalyst Center Assurance AP health.

Restrictions

- SI APs report only a single interference type in Local mode.
- SI does not support high availability for air quality or interference reports. High availability is not supported because the interference report or device report will not be copied to standby after switchover. The AP is expected to send the report again if the interfering device is still present.
- Spectrum Intelligence detects only three types of devices:
  - Microwave
  - continuous wave (such as video recorder, baby monitor)
  - SI-FHSS (Bluetooth and frequency hopping Digital European Cordless Telecommunications [DECT] phones).

Configure spectrum intelligence (CLI)

Enable network administrators to monitor and analyze the radio frequency (RF) environment by configuring the Spectrum Intelligence (SI) feature on Cisco APs.

Follow the procedure given below to configure spectrum intelligence:

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure the 2.4-GHz or 5-GHz spectrum intelligence feature on the 802.11a or 802.11b network.

Example:

```
Device(config)# ap dot11 {24ghz | 5ghz} SI
```

Add **no** form of the command to disable SI on the 802.11a or 802.11b network.

Verify spectrum intelligence information

Use these commands to verify spectrum intelligence information:

To display the SI information for a 2.4-GHz or 5-GHz band, use this command:

```
Device# show ap dot11 24ghz SI config

SI Solution..................................... : Enabled
Interference Device Settings:
SI_FHSS............................... : Enabled
Interference Device Types Triggering Alarms:
SI_FHSS............................... : Disabled
```

```
Device# show ap dot11 5ghz SI device type
RSSI  = Received Signal Strength Index (dBm)
DevID = Device ID
PD    = Persistent Device
Mac Address        DevID  Type          PD   AP Name                          RSSI  Channel
             Last Update Time
-------------------------------------------------------------------------------------------
3400.0401.0006     0x0006 BT Discovery   No   RRM-TSIM-3                        -88   40
               12/16/2020 18:11:28 UTC
```

To display SI interferers of type continuous transmitter for a 2.4-GHz band, use this command:

```
Device# show ap dot11 24ghz SI device type cont_tx

RSSI  = Received Signal Strength Index (dBm)
DevID = Device ID
Mac Address        DevID  Type          AP Name                          RSSI  Channel
-------------------------------------------------------------------------------------
xxxx.xxxx.xxxx     0xf001 Continuous TX Cisco-AP                       -47
```

To display 802.11a interference devices information for the given AP for 5-GHz, use this command:

```
Device# show ap dot11 5ghz SI device type ap

DC    = Duty Cycle (%)
ISI   = Interference Severity Index (1-Low Interference, 100-High Interference)
RSSI  = Received Signal Strength Index (dBm)
DevID = Device ID
AP type = CA, clean air, SI spectrum intelligence
No  ClusterID/BSSID    DevID  Type    AP Type AP Name                ISI  RSSI  DC   Channel
--- ------------------ ------ ------- ------  ---------------------- ---- ----- ---- ----------
```

To display SI interferers of type continuous transmitter for a 5-GHz band, use this command:

```
Device# show ap dot11 5ghz SI device type cont_tx

RSSI  = Received Signal Strength Index (dBm)
DevID = Device ID
Mac Address        DevID  Type          AP Name                          RSSI  Channel
-------------------------------------------------------------------------------------
xxxx.xxxx.xxx1     0xf001 Continuous TX Cisco-AP                         -88

xxxx.xxxx.xxx2     0xf002 Continuous TX Cisco-AP                         -88
```

To display all Cisco CleanAir interferers for a 2.4-GHz band, use this command:

```
Device# show ap dot11 24ghz cleanair device type all
```

Debugg spectrum intelligence on supported APs (CLI)

Enable troubleshooting and log generation for Spectrum Intelligence on supported APs using commands.

Procedure

Step 1 Generate major Spectrum Intelligence logs for an AP by entering this command.

Example:

```
debug cleanair major
```

Step 2 Verify the Spectrum Intelligence scan schedule of 5 seconds on an AP by entering this command

Example:

```
debug cleanair event
```

Step 3 Generate logs at 10-minute interval, when interference is not detected or reported by the AP, by entering this command.

Example:

```
debug cleanair raw 10
```

This command creates three files under **/tmp** directory from dev shell.

- spectrum.fft
- spectrum.dbg
- spectrum.int

Step 4 View the Spectrum Intelligence detected interfering devices by entering this command.

Example:

```
show cleanair interferers
```

Step 5 View the Spectrum Intelligence configuration status by entering this command.

Example:

```
show cleanair status
```