Spectrum Intelligence

Spectrum Intelligence

The Spectrum Intelligence feature scans for non-Wi-Fi radio interference on 2.4-GHz and 5-GHz bands. Spectrum intelligence provides basic functions to detect interferences of three types, namely microwave, continuous wave (like video bridge and baby monitor), wi-fi and frequency hopping (Bluetooth and frequency-hopping spread spectrum (FHSS) cordless phone).

The following Cisco access points (APs) support Spectrum Intelligence feature:

- Cisco Catalyst 9105 Series Wi-Fi 6 APs

- Cisco Catalyst 9115 Series Wi-Fi 6 APs

- Cisco Aironet 1852E/I APs

- Cisco Aironet 1832I APs

- Cisco Aironet 1815W/T/I/M APs

- Cisco Aironet 1810W/T APs

- Cisco Aironet 1800I/S APs

- Cisco Aironet 1542D/I APs

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

Restrictions

- SI APs only report 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 interference report/device reported will not be copied to standby after switchover. We expect AP to send it again, if at all interferer is still there.

- Spectrum Intelligence detects only three types of devices:

    - Microwave

    - Continuous wave—(video recorder, baby monitor)

    - SI-FHSS—(Bluetooth, Frequency hopping Digital European Cordless Telecommunications (DECT) phones)

Configuring Spectrum Intelligence

Follow the procedure given below to configure spectrum intelligence:

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 2	**ap dot11** {**24ghz** | **5ghz**} **SI** **Example:** `Device(config)# ap dot11 24ghz SI`	Configures the 2.4-GHz or 5-GHz Spectrum Intelligence feature on the 802.11a or 802.11b network. Add **no** form of the command to disable SI on the 802.11a or 802.11b network.

Verifying Spectrum Intelligence Information

Use the following commands to verify spectrum intelligence information:

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

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

Debugging Spectrum Intelligence on Supported APs (CLI)

You need to enter these commands in the AP console. For information about APs that support this feature see https://www.cisco.com/c/en/us/td/docs/wireless/access_point/feature-matrix/ap-feature-matrix.html.

Procedure

- Generate major Spectrum Intelligence logs for an AP by entering this command:

  debug cleanair major

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

  debug cleanair event

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

  debug cleanair raw 10

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

  - spectrum.fft

  - spectrum.dbg

  - spectrum.int

- View the Spectrum Intelligence detected interfering devices by entering this command:

  show cleanair interferers

- View the Spectrum Intelligence configuration status by entering this command:

  show cleanair status