Antenna Disconnection Detection

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Feature History for Antenna Disconnection Detection

This table provides release and related information for the features explained in this module.

These features are available in all releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Bengaluru 17.4.1	Antenna Disconnection Detection	This feature detects the signal strength delta across the antennas on the receiver. If the delta is more than the defined limit for a specific duration, the corresponding antenna is considered to have issues.

Information About Antenna Disconnection Detection

Having multiple antennas on the transmitter and receiver of an access point (AP) results in better performance and reliability. Multiple antennas improve reception through the selection of the stronger signal or a combination of individual signals at the receiver. Therefore, detection of an impaired antenna or physical breakage of an antenna is critical to the reliability of APs.

The Antenna Disconnection Detection feature is based on the signal strength delta across the antennas on the receiver. If the delta is more than the defined limit for a specific duration, the antenna is considered to have issues.

For every detection time period that you configure, the AP sends an Inter-Access Point Protocol (IAPP) message that carries the antenna condition. This message is sent only once when the issue is detected and is displayed in the controller trap messages, SNMP traps, and controller debug logs.

Configuration Workflow

1. Configure APs.
2. Configure an AP profile.
3. Enable the feature in AP profile.
4. Configure feature parameters.
5. Verify the configuration.

Recommendations and Limitations

- The feature is supported only on the following APs:
  - Cisco Catalyst 9120AX Series Access Points
  - Cisco Catalyst 9130AX Series Access Points
  - Cisco Aironet 2800e Access Points
  - Cisco Aironet 3800e Access Points
- The SNMP trap is not supported on the Cisco Embedded Wireless Controller.
- The IAPP message is sent only when there is a change in the error condition.

Configuring Antenna Disconnection Detection (CLI)

Antenna disconnection detection works by comparing the received signal strength intensity (RSSI) of each antenna with the antenna receiving the higher RSSI. If the delta is higher than the RSSI failure threshold, the corresponding antenna is declared as broken.

The *weak-rssi* is an absolute RSSI threshold value, expressed in dBm. If the antennas detect a lower RSSI value than the one configured in *weak-rssi*, all the antennas are reported as malfunctioning. The RSSI failure threshold is evaluated only if an antenna detects a signal over the *weak-rssi* value.

Follow the procedure given below to configure antenna disconnection detection:

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 2	**ap profile** *ap-profile* **Example:** `Device(config)# ap profile xyz-ap-profile`	Configures an AP profile and enters AP profile configuration mode.
Step 3	**antenna monitoring** **Example:** `Device(config-ap-profile)# antenna monitoring`	Enables antenna disconnection detection. To disable antenna disconnection detection, use the **no antenna monitoring** command.
Step 4	**antenna monitoring rssi-failure-threshold** *threshold-value* **Example:** `Device(config-ap-profile)# antenna monitoring rssi-failure-threshold 20`	Configures RSSI failure threshold value, in dB. Valid values range from 10 to 90, with a default of 40.
Step 5	**antenna monitoring weak-rssi** *weak-rssi-value* **Example:** `Device(config-ap-profile)# antenna monitoring weak-rssi -90`	Configures weak RSSI value, in dBm. Valid values range from -90 to -10, with a default of 60.
Step 6	**antenna monitoring detection-time** *detect-time-in-mins* **Example:** `Device(config-ap-profile)# antenna monitoring detection-time 20`	Configures the antenna disconnection detection time, in minutes. Valid values range from 9 to 180, with a default of 120.
Step 7	**end** **Example:** `Device(config-ap-profile)# end`	Saves the configuration and returns to privileged EXEC mode.

Configuring Antenna Disconnection Detection (GUI)

Procedure

Step 1 Choose **Configuration > Tags & Profiles > AP Join**.

Step 2 In the **AP Join Profile** window, click the **General** tab.

Step 3 In the **Antenna Monitoring** check box to enable antenna monitoring.

Step 4 In the **RSSI Fail Threshold(dB)** field, enter a value, in dB. Valid values range from 10 to 90, with a default of 40.

Step 5 In the **Weak RSSI(dBm)** field, enter a value, in dBm. Valid values range from -90 to -10, with a default of 60.

Step 6 In the **Detection Time(min)** field, enter the antenna disconnection detection time, in minutes. Valid values range from 9 to 180, with a default of 120.

Step 7 Click **Update & Apply to Device**.

Detecting Broken Antenna Using SNMP Trap (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 2	**snmp-server enable traps** **Example:** `Device(config)# snmp-server enable traps`	Enables all the SNMP notification types that are available on the system.
Step 3	**trapflags ap broken-antenna** **Example:** `Device(config)# trapflags ap broken-antenna`	Enables an SNMP trap, which will be sent when an antenna fails in any Cisco AP.
Step 4	**end** **Example:** `Device(config)# end`	Returns to privileged EXEC mode.

Detecting Broken Antenna Using SNMP Trap (GUI)

Procedure

Step 1 Choose **Administration > Management > SNMP**.

Step 2 Click the **Wireless Traps** tab.

Step 3 Set the **Access Point** status as **Enabled**, if not done already.

Step 4 Check the **Broken Antenna** check box to enable the trap.

Step 5 Click **Apply**.

Verifying Antenna Disconnection Detection

To verify the Antenna Disconnection Detection feature configuration on an AP, use the following command:

```
Device# show ap name 3800-AP config general

Cisco AP Name: 3800-AP
================================================

Cisco AP Identifier                             : f4db.e632.df40
Country Code                                    : Multiple Countries : US,IN,CN,CU
Regulatory Domain Allowed by Country            : 802.11bg:-ACE   802.11a:-ABCDHN
AP Country Code                                 : CN  - China
AP Regulatory Domain
  Slot 0                                        : -E
  Slot 1                                        : -C
MAC Address                                     : f4db.e62f.165a
IP Address Configuration                        : DHCP
IP Address                                      : 9.9.33.3
IP Netmask                                      : 255.255.255.0
Gateway IP Address                              : 9.9.33.1
Fallback IP Address Being Used                  :
Domain                                          :
Name Server                                     :
CAPWAP Path MTU                                 : 1485
Capwap Active Window Size                       : 1

.
.
.

AP broken antenna detection                             : Enabled
RSSI threshold                                          : 40
Weak RSSI                                               : -80
Detection Time                                          : 120

.
.
.
```

To verify the Antenna Disconnection Detection feature configuration on an AP profile, use the following command:

```
Device# show ap profile name rf-profile-24g detailed

AP Profile Name: rf-profile-24g
.
.
.
AP broken antenna detection:
  Status                                                : ENABLED
  RSSI threshold                                        : 40
  Weak RSSI                                             : -80
  Detection Time                                        : 120
```

Verifying Antenna Disconnection Detection (GUI)

Procedure

Step 1 Choose **Monitoring > Wireless > AP Statistics**.

Step 2 Click an AP name or anywhere on the row corresponding to an AP in order to activate **General** window.

Step 3 Click the **360 View** tab.

The 360 View tab is the default selection. The **Antenna Monitoring** field indicates whether the AP supports monitoring or not.