Persistent Device Avoidance

Information about Cisco Persistent Device Avoidance

The Cisco CleanAir Persistent device avoidance (PDA) feature is a part of spectrum management. Some interference devices, such as, outdoor bridges and microwave ovens, transmit signals only when required. These devices can cause significant interference to the local WLAN, because short-duration and periodic operations remain largely undetected by normal RF management metrics. With Cisco CleanAir (CleanAir), the RRM dynamic channel allocation (DCA) algorithm can detect, measure, register, and remember the impact, and adjust the RRM DCA algorithm. The PDA process minimizes the use of channels affected by persistent devices in the channel plan, local to the interference source. CleanAir detects and stores persistent device information in the controller. This information is used to mitigate the interfering channels.

Persistent Devices Detection - CleanAir-capable monitor mode APs collect information about persistent devices on all the configured channels and store the information in the controller. Local or bridge mode APs detect interference devices only on the serving channels.

The PDA feature works seamlessly on all platforms. All the AP models that are capable of CleanAir and Spectrum Intelligence support the PDA feature.

The supported platforms are:

- Cisco Aironet 1852 Access Points
- Cisco Aironet 1832 Access Points
- Cisco Aironet 2700 Series Access Points
- Cisco Aironet 2800 Series Access Points
- Cisco Aironet 3700 Series Access Points
- Cisco Aironet 3800 Series Access Points
- Cisco Aironet 4800 Series Access Points
- Cisco Catalyst 9115 Series Access Points

- Cisco Catalyst 9117 Series Access Points
- Cisco Catalyst 9120AX Series Access Points
- Cisco Catalyst 9124AX Series Access Points
- Cisco Catalyst 9130AX Access Points

Configuring Persistent Device Avoidance (GUI)

Procedure

Step 1 Choose **Configurations** > **Radio Configurations** > **RRM**

Step 2 Click the **5 GHz Band** tab or the **2.4 GHz Band**, and click the **DCA** tab.

Step 3 In the **DCA** window, under the **Dynamic Channel Assignment Algorithm** section, check the **Avoid Persistent Non-WiFi Interference** check box to enable the device to ignore persistent non-WiFi interference.

Step 4 Click **Apply**.

Configuring Persistent Device Avoidance (CLI)

You can enable and disable the PDA feature and PDA propagation configuration mode through the RRM Manager.

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 2	**[no] ap dot11 {24ghz | 5ghz} rrm channel device** **Example:** `Device# [no] ap dot11 24ghz rrm channel device`	Configures persistent non-WiFi device avoidance in the 802.11a or 802.11b channel assignment. Use the **no** form of this command to negate the command or to set its defaults.

Verifying Persistent Device Avoidance

To verify the current state of **Device Aware** detail of the channel, use the following command:

```
Device#show ap dot11 24ghz channel
Leader Automatic Channel Assignment
  Channel Assignment Mode                   : AUTO
```

```
  Channel Update Interval                    : 600 seconds
  Anchor time (Hour of the day)              : 0
  Channel Update Contribution
    Noise                                    : Enable
    Interference                             : Enable
    Load                                     : Disable
    Device Aware                         :   Enable
  CleanAir Event-driven RRM option           : Disabled
  Channel Assignment Leader                  : cisco-vwlc (9.9.39.73)
  Last Run                                   : 166 seconds ago

  DCA Sensitivity Level                      : MEDIUM : 10 dB
  DCA Minimum Energy Limit                   : -95 dBm
  Channel Energy Levels
    Minimum                                  : -82 dBm
    Average                                  : -82 dBm
    Maximum                                  : -82 dBm
  Channel Dwell Times
    Minimum                                  : 8 days 0 hour 43 minutes 13 seconds
    Average                                  : 8 days 0 hour 43 minutes 13 seconds
    Maximum                                  : 8 days 0 hour 43 minutes 13 seconds
  802.11b 2.4 GHz Auto-RF Channel List
    Allowed Channel List                     : 1,6,11
    Unused Channel List                      : 2,3,4,5,7,8,9,10
```

```
Device#show ap dot11 24ghz cleanair device type all
DC    = Duty Cycle (%)
ISI   = Interference Severity Index (1-Low Interference, 100-High Interference)
RSSI  = Received Signal Strength Index (dBm)
DevID = Device ID
PD    = Persistent Device

ClusterID          Mac Address        DevID  Type           PD   AP Name
        Version  ISI  RSSI  DC   Channel              Last Update Time
-------------------------------------------------------------------------------------------------
9800.0000.0004     3400.0200.0001     0x0001 Jammer         No   RRM-TSIM-1
        CA       100  -67   100  1,2                  12/16/2020 18:32:42 UTC
9800.0000.0005     3400.0200.0004     0x0004 Xbox           No   RRM-TSIM-1
        CA       45   -73   45   1                    12/16/2020 18:32:42 UTC
9800.0000.0006     3400.0200.0006     0x0006 TDD Transmit   No   RRM-TSIM-1
        CA       10   -75   10   1,2                  12/16/2020 18:32:42 UTC
9800.0000.0006     3400.0200.0007     0x0007 Continuous TX  No   RRM-TSIM-1
        CA       30   -77   30   1,2                  12/16/2020 18:32:42 UTC
9800.0000.0007     3400.0200.0009     0x0009 802.15.4       No   RRM-TSIM-1
        CA       10   -95   10   1,2                  12/16/2020 18:32:42 UTC
```

```
Device# show ap dot11 5ghz cleanair device type all
DC    = Duty Cycle (%)
ISI   = Interference Severity Index (1-Low Interference, 100-High Interference)
RSSI  = Received Signal Strength Index (dBm)
DevID = Device ID
PD    = Persistent Device

ClusterID          Mac Address        DevID  Type           PD   AP Name
        Version  ISI  RSSI  DC   Channel              Last Update Time
-------------------------------------------------------------------------------------------------
9800.0000.0000     3400.0201.0002     0x0002 WiFi Inverted  No   RRM-TSIM-1
        CA       45   -63   45   40                   12/16/2020 18:32:42 UTC
9800.0000.0001     3400.0201.0004     0x0004 TDD Transmit   No   RRM-TSIM-1
        CA       10   -76   10   40                   12/16/2020 18:32:42 UTC
9800.0000.0001     3400.0201.0005     0x0005 Continuous TX  No   RRM-TSIM-1
        CA       30   -77   30   40                   12/16/2020 18:32:42 UTC
9800.0000.0002     3400.0201.0007     0x0007 BT Link        No   RRM-TSIM-1
        CA       10   -88   10   40                   12/16/2020 18:32:42 UTC
```

To verify all the reported interferers along with the class type, use the following command:

```
Device# show ap dot11 24ghz cleanair device type wimax-mobile
DC    = Duty Cycle (%)
ISI   = Interference Severity Index (1-Low Interference, 100-High Interference)
RSSI  = Received Signal Strength Index (dBm)
DevID = Device ID

ClusterID          Mac Address        DevID  Type          AP Name                     ISI
  RSSI  DC   Channel
-------------------------------------------------------------------------------------------------
1900.0000.0006     xxxx.xxxx.xxx1     0xc001 WiMax Mobile  Cisco-AP                     4
   -88   1
1900.0000.0007     xxxx.xxxx.xxx2     0xc002 WiMax Mobile  Cisco-AP                     4
   -88   1
```

To verify the persistent device information under Auto-RF, use the following command:

```
Device#show ap auto-rf dot11 24ghz
Number of Slots            : 2
AP Name                    : VANC-AP
MAC Address                : d4c9.3ce5.c760
Slot ID                    : 0
Radio Type                 : 802.11n - 2.4 GHz
….….….….
Noise Information
……...
Persistent Interference Devices
Class Type                 Channel  DC (%%)  RSSI (dBm)  Last Update Time
-------------------------  -------  ------   ---------   ----------------
MW Oven                     11      NA        -71        08/22/2019 12:03:18 UTC
MW Oven                     11      NA        -24        08/22/2019 12:03:19 UTC
MW Oven                     11      NA        -17        08/22/2019 12:03:16 UTC
MW Oven                     11      NA        -22        08/22/2019 12:03:19 UTC
```

To verify the persistent device information under Auto-RF for specific Cisco APs, use the following command:

```
Device#show ap name ap_name auto-rf dot11 24ghz

Number of Slots            : 2
AP Name                    : VANC-AP
MAC Address                : d4c9.3ce5.c760
Slot ID                    : 0
Radio Type                 : 802.11n - 2.4 GHz
….….….….
Noise Information
……...
Persistent Interference Devices
Class Type                 Channel  DC (%%)  RSSI (dBm)  Last Update Time
-------------------------  -------  ------   ---------   ----------------
MW Oven                     11      NA        -71        08/22/2019 12:03:18 UTC
MW Oven                     11      NA        -24        08/22/2019 12:03:19 UTC
MW Oven                     11      NA        -17        08/22/2019 12:03:16 UTC
MW Oven                     11      NA        -22        08/22/2019 12:03:19 UTC
```