



## Persistent Device Avoidance

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### 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

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- 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**.
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## 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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>[no] ap dot11 {24ghz   5ghz} rrm channel device</b>  <b>Example:</b> 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 <b>no</b> 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 -88 1	xxxx.xxxx.xxx1	0xc001	WiMax Mobile	Cisco-AP	4
1900.0000.0007 -88 1	xxxx.xxxx.xxx2	0xc002	WiMax Mobile	Cisco-AP	4

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
```