



## CleanAir Commands

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## ap dot11 5ghz cleanair

To enable CleanAir for detecting 5-GHz devices, use the **ap dot11 5ghz cleanair** command in global configuration mode.

**ap dot11 5ghz cleanair**

### Command Default

Disabled.

### Command Modes

Global configuration.

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Usage Guidelines

You must enable this CleanAir command before you configure other CleanAir commands.

### Examples

This example shows how to enable CleanAir for 5-GHz devices:

```
Controller(config)# ap dot11 5ghz cleanair
```

## ap dot11 5ghz cleanair alarm air-quality

To configure the alarm when the Air Quality (AQ) reaches the threshold value for the 5-GHz devices, use the **ap dot11 5ghz cleanair alarm air-quality** command. To disable the alarm when the AQ reaches the threshold value for the 5-GHz devices, use the **no** form of this command.

**ap dot11 5ghz cleanair alarm air-quality threshold** *threshold \_value*

| Syntax Description | threshold <i>threshold _value</i> | Configures the threshold value for air quality. The range is from 1 to 100. |
|--------------------|-----------------------------------|---|
|--------------------|-----------------------------------|---|

**Command Default** The default threshold value for AQ is 10.

**Command Modes** Global configuration (config).

| Command History | Release            | Modification                 |
|-----------------|--------------------|------------------------------|
|                 | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** You must enable CleanAir using the **ap dot11 5ghz cleanair** command before you configure this command.

**Examples** This example shows how to set the threshold value for the AQ:

```
Controller(config)# ap dot11 5ghz cleanair alarm air-quality threshold 30
```

# ap dot11 5ghz cleanair alarm device

To configure the alarm for the 5-GHz interference devices, use the **ap dot11 5ghz cleanair alarm device** command.

```
ap dot11 5ghz cleanair alarm device {canopy | cont-tx | dect-like | inv | jammer | nonstd | radar | superag | tdd-tx | video | wimax-fixed | wimax-mobile}
```

## Syntax Description

|                     |  |
|---------------------|--|
| <b>canopy</b>       | Configures the alarm for canopy interference devices.                                |
| <b>cont-tx</b>      | Configures the alarm for continuous transmitters.                                    |
| <b>dect-like</b>    | Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones. |
| <b>inv</b>          | Configures the alarm for devices using spectrally inverted Wi-Fi signals.            |
| <b>jammer</b>       | Configures the alarm for jammer interference devices.                                |
| <b>nonstd</b>       | Configures the alarm for devices using nonstandard Wi-Fi channels.                   |
| <b>radar</b>        | Configures the alarm for radars.   |
| <b>superag</b>      | Configures the alarm for 802.11 SuperAG interference devices.                        |
| <b>tdd-tx</b>       | Configures the alarm for Time Division Duplex (TDD) transmitters.                    |
| <b>video</b>        | Configures the alarm for video cameras.  |
| <b>wimax-fixed</b>  | Configures the alarm for WiMax fixed interference devices.                           |
| <b>wimax-mobile</b> | Configures the alarm for WiMax mobile interference devices.                          |

## Command Default

The alarm for Wi-Fi inverted devices is enabled and for all other interference devices is disabled.

## Command Modes

Global configuration (config).

## Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

## Usage Guidelines

You must enable CleanAir using the **ap dot11 5ghz cleanair** command before you configure this command.

**Examples**

This example shows how to enable the alarm to notify interferences from a radar device:

```
Controller(config)# ap dot11 5ghz cleanair alarm device radar
```

## default ap dot11 5ghz cleanair device

To configure the default state of the alarm for 5-GHz interference devices, use the **default ap dot11 5ghz cleanair device** command in global configuration mode.

```
default ap dot11 5ghz cleanair device {canopy | cont-tx | dect-like | inv | jammer | nonstd | radar | report | superag | tdd-tx | video | wimax-fixed | wimax-mobile}
```

### Syntax Description

|                     |  |
|---------------------|--|
| <b>canopy</b>       | Configures the alarm for canopy interference devices.                                |
| <b>cont-tx</b>      | Configures the alarm for continuous transmitters.                                    |
| <b>dect-like</b>    | Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones. |
| <b>inv</b>          | Configures the alarm for devices using spectrally inverted Wi-Fi signals.            |
| <b>jammer</b>       | Configures the alarm for jammer interference devices.                                |
| <b>nonstd</b>       | Configures the alarm for devices using nonstandard Wi-Fi channels.                   |
| <b>radar</b>        | Configures the alarm for radars.   |
| <b>report</b>       | Enables interference device reports.   |
| <b>superag</b>      | Configures the alarm for 802.11 SuperAG interference devices.                        |
| <b>tdd-tx</b>       | Configures the alarm for Time Division Duplex (TDD) transmitters.                    |
| <b>video</b>        | Configures the alarm for video cameras.  |
| <b>wimax-fixed</b>  | Configures the alarm for WiMax fixed interference devices.                           |
| <b>wimax-mobile</b> | Configures the alarm for WiMax mobile interference devices.                          |

### Command Default

The alarm for Wi-Fi inverted devices is enabled. The alarm for all other interference devices is disabled.

### Command Modes

Global configuration (config).

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

You must enable CleanAir using the **ap dot11 5ghz cleanair** command before you configure this command.

**Examples**

This example shows how to enable CleanAir to report when a video camera interferes:

```
Controller(config)# default ap dot11 5ghz cleanair device video
```



## ap dot11 5ghz rrm channel cleanair-event

To enable Event-Driven RRM (EDRRM) and configure the sensitivity for 5-GHz devices, use the **ap dot11 5ghz rrm channel cleanair-event** command in global configuration mode. To disable EDRRM, use the **no** form of the command.

**ap dot11 5ghz rrm channel cleanair-event** [sensitivity {high| low| medium}]

**no ap dot11 5ghz rrm channel cleanair-event** [sensitivity {high| low| medium}]

### Syntax Description

|                    |  |
|--------------------|--|
| <b>sensitivity</b> | (Optional) Configures the EDRRM sensitivity of the CleanAir event.   |
| <b>high</b>        | (Optional) Specifies the highest sensitivity to non-Wi-Fi interference as indicated by the air quality (AQ) value. |
| <b>low</b>         | (Optional) Specifies the least sensitivity to non-Wi-Fi interference as indicated by the AQ value.                 |
| <b>medium</b>      | (Optional) Specifies medium sensitivity to non-Wi-Fi interference as indicated by the AQ value.                    |

### Command Default

EDRRM is disabled and the EDRRM sensitivity is low.

### Command Modes

Global configuration (config).

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Usage Guidelines

You must enable EDRRM using the **ap dot11 5ghz rrm channel cleanair-event** command before you configure the sensitivity.

### Examples

This example shows how to enable EDRRM and set the EDRRM sensitivity to high:

```
Controller(config)# ap dot11 5ghz rrm channel cleanair-event
Controller(config)# ap dot11 5ghz rrm channel cleanair-event sensitivity high
```

## ap dot11 5ghz rrm channel device

To configure persistent non-Wi-Fi device avoidance in the 802.11a channel, use the **ap dot11 5ghz rrm channel device** command in global configuration mode. To disable persistent device avoidance, use the **no** form of this command.

**ap dot11 5ghz rrm channel device**

**no ap dot11 5ghz rrm channel device**

**Syntax Description** This command has no arguments or keywords.

**Command Default** The CleanAir persistent device state is disabled.

**Command Modes** Global configuration (config)

| Command History | Release            | Modification                 |
|-----------------|--------------------|------------------------------|
|                 | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** CleanAir-capable monitor mode access points collect information about persistent devices on all configured channels and stores the information in the controller. Local and bridge mode access points detect interference devices on the serving channels only.

**Examples** This example shows how to enable persistent device avoidance on 802.11a devices:  
 Controller(config)# **ap dot11 5ghz rrm channel device**

## ap dot11 24ghz cleanair

To enable CleanAir for detecting 2.4-GHz devices, use the **ap dot11 24ghz cleanair** command in global configuration mode. To disable CleanAir for detecting 2.4-GHz devices, use the **no** form of this command.

**ap dot11 24ghz cleanair**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Disabled.

**Command Modes** Global configuration (config).

| <b>Command History</b> | <b>Release</b>     | <b>Modification</b>          |
|------------------------|--------------------|------------------------------|
|                        | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** You must enable this CleanAir command before you configure other CleanAir commands.

**Examples** This example shows how to enable CleanAir for 2.4-GHz devices:

```
Controller(config)# ap dot11 24ghz cleanair
```

## ap dot11 24ghz cleanair alarm air-quality

To configure the alarm for the threshold value of Air Quality (AQ) for all 2.4-GHz devices, use the **ap dot11 24ghz cleanair alarm air-quality** command in global configuration mode. To disable the alarm for the threshold value of AQ for all 2.4-GHz devices, use the **no** form of this command.

**ap dot11 24ghz cleanair alarm air-quality threshold** *threshold\_value*

### Syntax Description

|   |  |
|---|--|
| <b>threshold</b> <i>threshold_value</i> | Configures the threshold value for AQ. The range is from 1 to 100. |
|---|--|

### Command Default

The default threshold value for AQ is 10.

### Command Modes

Global configuration (config)

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Usage Guidelines

You must enable CleanAir using the **ap dot11 24ghz cleanair** command before you configure this command.

### Examples

This example shows how to set the threshold value for the AQ:

```
Controller(config)# ap dot11 24ghz cleanair alarm air-quality threshold 50
```

## ap dot11 24ghz cleanair alarm device

To configure the alarm for the 2.4-GHz interference devices, use the **ap dot11 24ghz cleanair alarm device** command in global configuration mode. To disable the alarm for the 2.4-GHz interference devices, use the **no** form of this command.

```
ap dot11 24ghz cleanairalarm {device | bt-discovery | bt-link canopy| cont-tx | dect-like | fh | inv | jammer
| mw-oven | nonstd | superag | tdd-tx video | wimax-fixed | wimax-mobile | xbox | zigbee}
```

### Syntax Description

|                     |  |
|---------------------|--|
| <b>bt-discovery</b> | Configures the alarm for Bluetooth interference devices.                             |
| <b>bt-link</b>      | Configures the alarm for any Bluetooth link.   |
| <b>canopy</b>       | Configures the alarm for canopy interference devices.                                |
| <b>cont-tx</b>      | Configures the alarm for continuous transmitters.                                    |
| <b>dect-like</b>    | Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones. |
| <b>fh</b>           | Configures the alarm for 802.11 frequency hopping (FH) devices.                      |
| <b>inv</b>          | Configures the alarm for devices using spectrally inverted Wi-Fi signals.            |
| <b>jammer</b>       | Configures the alarm for jammer interference devices.                                |
| <b>mw-oven</b>      | Configures the alarm for microwave ovens.  |
| <b>nonstd</b>       | Configures the alarm for devices using nonstandard Wi-Fi channels.                   |
| <b>superag</b>      | Configures the alarm for 802.11 SuperAG interference devices.                        |
| <b>tdd-tx</b>       | Configures the alarm for Time Division Duplex (TDD) transmitters.                    |
| <b>video</b>        | Configures the alarm for video cameras.  |
| <b>wimax-fixed</b>  | Configures the alarm for WiMax fixed interference devices.                           |
| <b>wimax-mobile</b> | Configures the alarm for WiMax mobile interference devices.                          |
| <b>xbox</b>         | Configures the alarm for Xbox interference devices.                                  |
| <b>zigbee</b>       | Configures the alarm for 802.15.4 interference devices.                              |

### Command Default

The alarm for Wi-Fi inverted devices is enabled. The alarm for all other devices is disabled.

**Command Modes** Global configuration (config).

| <b>Command History</b> | <b>Release</b>     | <b>Modification</b>          |
|------------------------|--------------------|------------------------------|
|                        | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** You must enable CleanAir using the **ap dot11 24ghz cleanair** command before you configure this command.

**Examples** This example shows how to enable the alarm to notify interferences from a Zigbee device:

```
Controller(config)# ap dot11 24ghz cleanair alarm device zigbee
```

## default ap dot11 24ghz cleanair device

To configure the default state of report generation for 2.4-GHz interference devices, use the **default ap dot11 24ghz cleanair device** command in global configuration mode.

```
default ap dot11 24ghz cleanair device {bt-discovery | bt-link | canopy | cont-tx | dect-like | fh | inv |
jammer | mw-oven | nonstd | report | superag | tdd-tx | video | wimax-fixed | wimax-mobile | xbox |
zigbee}
```

### Syntax Description

|                     |  |
|---------------------|--|
| <b>bt-discovery</b> | Configures the alarm for Bluetooth interference devices.                             |
| <b>bt-link</b>      | Configures the alarm for any Bluetooth link.   |
| <b>canopy</b>       | Configures the alarm for canopy interference devices.                                |
| <b>cont-tx</b>      | Configures the alarm for continuous transmitters.                                    |
| <b>dect-like</b>    | Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones. |
| <b>fh</b>           | Configures the alarm for 802.11 frequency hopping devices.                           |
| <b>inv</b>          | Configures the alarm for devices using spectrally inverted Wi-Fi signals.            |
| <b>jammer</b>       | Configures the alarm for jammer interference devices.                                |
| <b>mw-oven</b>      | Configures the alarm for microwave ovens.  |
| <b>nonstd</b>       | Configures the alarm for devices using nonstandard Wi-Fi channels.                   |
| <b>superag</b>      | Configures the alarm for 802.11 SuperAG interference devices.                        |
| <b>tdd-tx</b>       | Configures the alarm for Time Division Duplex (TDD) transmitters.                    |
| <b>video</b>        | Configures the alarm for video cameras.  |
| <b>wimax-fixed</b>  | Configures the alarm for WiMax fixed interference devices.                           |
| <b>wimax-mobile</b> | Configures the alarm for WiMax mobile interference devices.                          |
| <b>xbox</b>         | Configures the alarm for Xbox interference devices.                                  |
| <b>zigbee</b>       | Configures the alarm for 802.15.4 interference devices.                              |

### Command Default

The alarm for Wi-Fi inverted devices is enabled. The alarm for all other devices is disabled.

**Command Modes** Global configuration (config).

| <b>Command History</b> | <b>Release</b>     | <b>Modification</b>          |
|------------------------|--------------------|------------------------------|
|                        | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** You must enable CleanAir using the **ap dot11 24ghz cleanair** command before you configure this command.

**Examples** This example shows how to enable CleanAir to report when a video camera interferes:

```
Controller(config)# default ap dot11 24ghz cleanair device video
```



## ap dot11 24ghz rrm channel cleanair-event

To enable Event-Driven RRM (EDRRM) and the sensitivity for 2.4-GHz devices, use the **ap dot11 24ghz rrm channel cleanair-event** command in global configuration mode. To disable EDRRM, use the **no** form of this command.

**ap dot11 24ghz rrm channel cleanair-event sensitivity {high | low | medium}**

**no ap dot11 24ghz rrm channel cleanair-event [sensitivity{high | low | medium}]**

### Syntax Description

|                    |  |
|--------------------|--|
| <b>sensitivity</b> | (Optional) Configures the EDRRM sensitivity of the CleanAir event.   |
| <b>high</b>        | (Optional) Specifies the highest sensitivity to non-Wi-Fi interference as indicated by the air quality (AQ) value. |
| <b>low</b>         | (Optional) Specifies the least sensitivity to non-Wi-Fi interference as indicated by the AQ value.                 |
| <b>medium</b>      | (Optional) Specifies medium sensitivity to non-Wi-Fi interference as indicated by the AQ value.                    |

### Command Default

EDRRM is disabled and the sensitivity is low.

### Command Modes

Global configuration (config).

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Usage Guidelines

You must enable EDRRM using the **ap dot11 24ghz rrm channel cleanair-event** command before you configure the sensitivity.

### Examples

This example shows how to enable EDRRM and set the EDRRM sensitivity to low:

```
Controller(config)# ap dot11 24ghz rrm channel cleanair-event
Controller(config)# ap dot11 24ghz rrm channel cleanair-event sensitivity low
```

## ap dot11 24ghz rrm channel device

To configure persistent non-Wi-Fi device avoidance in the 802.11b channel, use the **ap dot11 24ghz rrm channel device** command in global configuration mode. To disable persistent device avoidance, use the **no** form of this command.

**ap dot11 24ghz rrm channel device**

**no ap dot11 24ghz rrm channel device**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Persistent device avoidance is disabled.

**Command Modes** Global configuration (config).

| Command History | Release            | Modification                 |
|-----------------|--------------------|------------------------------|
|                 | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** CleanAir-capable monitor mode access points collect information about persistent devices on all configured channels and stores the information in the controller. Local and bridge mode access points detect interference devices on the serving channels only.

**Examples** This example shows how to enable persistent device avoidance:  
 Controller(config)# **ap dot11 24ghz rrm channel device**

## ap name mode se-connect

To configure the access point for SE-Connect mode, use the **ap name *ap\_name* mode se-connect** command in privileged exec mode.

**ap name *ap\_name* mode se-connect**

### Syntax Description

|                |                           |
|----------------|---------------------------|
| <i>ap_name</i> | Name of the access point. |
|----------------|---------------------------|

### Command Default

No access point is configured for SE-Connect mode.

### Command Modes

Privileged EXEC (#)

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Usage Guidelines

The access point will reboot after you change the mode.

SE-connect mode enables a user to connect a Spectrum Expert application running on an external Microsoft Windows XP or Vista PC to a Cisco CleanAir-enabled access point in order to display and analyze detailed spectrum data. The Spectrum Expert application connects directly to the access point, by passing the controller. An access point in SE-Connect mode does not provide any Wi-Fi, RF, or spectrum data to the controller. All CleanAir system functionality is suspended while the AP is in this mode, and no clients are served. This mode is intended for remote troubleshooting only.

### Examples

This example shows how to change the mode of the access point to SE-Connect:

```
Controller# ap name AS-5508-5-AP3 mode se-connect
```

```
Changing the AP's mode will cause the AP to reboot.
```

```
Are you sure you want to continue? (y/n)[y]: y
```

```
% switch-1:wcm: Cisco AP does not support the seconnect mode
```

## default ap dot11 5ghz cleanair device

To configure the default state of the alarm for 5-GHz interference devices, use the **default ap dot11 5ghz cleanair device** command in global configuration mode.

**default ap dot11 5ghz cleanair device** {canopy | cont-tx | dect-like | inv | jammer | nonstd | radar | report | superag | tdd-tx | video | wimax-fixed | wimax-mobile}

### Syntax Description

|                     |  |
|---------------------|--|
| <b>canopy</b>       | Configures the alarm for canopy interference devices.                                |
| <b>cont-tx</b>      | Configures the alarm for continuous transmitters.                                    |
| <b>dect-like</b>    | Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones. |
| <b>inv</b>          | Configures the alarm for devices using spectrally inverted Wi-Fi signals.            |
| <b>jammer</b>       | Configures the alarm for jammer interference devices.                                |
| <b>nonstd</b>       | Configures the alarm for devices using nonstandard Wi-Fi channels.                   |
| <b>radar</b>        | Configures the alarm for radars.   |
| <b>report</b>       | Enables interference device reports.   |
| <b>superag</b>      | Configures the alarm for 802.11 SuperAG interference devices.                        |
| <b>tdd-tx</b>       | Configures the alarm for Time Division Duplex (TDD) transmitters.                    |
| <b>video</b>        | Configures the alarm for video cameras.  |
| <b>wimax-fixed</b>  | Configures the alarm for WiMax fixed interference devices.                           |
| <b>wimax-mobile</b> | Configures the alarm for WiMax mobile interference devices.                          |

### Command Default

The alarm for Wi-Fi inverted devices is enabled. The alarm for all other interference devices is disabled.

### Command Modes

Global configuration (config).

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

You must enable CleanAir using the **ap dot11 5ghz cleanair** command before you configure this command.

**Examples**

This example shows how to enable CleanAir to report when a video camera interferes:

```
Controller(config)# default ap dot11 5ghz cleanair device video
```

## default ap dot11 5ghz rrm channel cleanair-event

To configure the default state of Event-Driven radio resource management (EDRRM) and the EDRRM sensitivity for 5-GHz devices, use the **default ap dot11 5ghz rrm channel cleanair-event** command in global configuration mode.

**default ap dot11 5ghz rrm channel cleanair-event** [sensitivity {**high** | **low** | **medium**}]

### Syntax Description

|                    |  |
|--------------------|--|
| <b>sensitivity</b> | (Optional) Configures the EDRRM sensitivity of the CleanAir event.   |
| <b>high</b>        | (Optional) Specifies the highest sensitivity to non-Wi-Fi interference as indicated by the Air Quality (AQ) value. |
| <b>low</b>         | (Optional) Specifies the least sensitivity to non-Wi-Fi interference as indicated by the AQ value.                 |
| <b>medium</b>      | (Optional) Specifies medium sensitivity to non-Wi-Fi interference as indicated by the AQ value.                    |

### Command Default

EDRRM is disabled and the sensitivity is low.

### Command Modes

Global configuration (config).

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Usage Guidelines

You must enable EDRRM before you configure the sensitivity.

### Examples

This example shows how to set the default EDRRM state and sensitivity:

```
Controller(config)# default ap dot11 5ghz rrm channel cleanair-event
Controller(config)# default ap dot11 5ghz rrm channel cleanair-event sensitivity
```

## default ap dot11 5ghz rrm channel device

To configure the default state of the persistent non-Wi-Fi device avoidance in the 802.11a channels, use the **default ap dot11 5ghz rrm channel device** command in global configuration mode.

**default ap dot11 5ghz rrm channel device**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Persistent device state is disabled.

**Command Modes** Global configuration (config)

| <b>Command History</b> | <b>Release</b>     | <b>Modification</b>          |
|------------------------|--------------------|------------------------------|
|                        | Cisco IOS XE 3.3SE | This command was introduced. |

**Examples** This example shows how to configure persistent non-Wi-Fi device avoidance in the 802.11a channels:

```
Controller(config)# default ap dot11 5ghz rrm channel device
```

## default ap dot11 24ghz cleanair alarm device

To configure the default value of the alarm for 2.4-GHz interference devices, use the **default ap dot11 24ghz cleanair alarm device** command in global configuration mode.

```
default ap dot11 24ghz cleanair alarm device {bt-discovery | bt-link | canopy | cont-tx | dect-like | fh |
inv | jammer | mw-oven| nonstd | superag | tdd-tx | video | wimax-fixed | wimax-mobile | xbox | zigbee}
```

### Syntax Description

|                     |  |
|---------------------|--|
| <b>bt-discovery</b> | Configures the alarm for Bluetooth interference devices.                             |
| <b>bt-link</b>      | Configures the alarm for any Bluetooth link.   |
| <b>canopy</b>       | Configures the alarm for canopy interference devices.                                |
| <b>cont-tx</b>      | Configures the alarm for continuous transmitters.                                    |
| <b>dect-like</b>    | Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones. |
| <b>fh</b>           | Configures the alarm for 802.11 frequency hopping (FH) devices.                      |
| <b>inv</b>          | Configures the alarm for devices using spectrally inverted Wi-Fi signals.            |
| <b>jammer</b>       | Configures the alarm for jammer interference devices.                                |
| <b>mw-oven</b>      | Configures the alarm for microwave ovens.  |
| <b>nonstd</b>       | Configures the alarm for devices using nonstandard Wi-Fi channels.                   |
| <b>superag</b>      | Configures the alarm for 802.11 SuperAG interference devices.                        |
| <b>tdd-tx</b>       | Configures the alarm for Time Division Duplex (TDD) transmitters.                    |
| <b>video</b>        | Configures the alarm for video cameras.  |
| <b>wimax-fixed</b>  | Configures the alarm for WiMax fixed interference devices.                           |
| <b>wimax-mobile</b> | Configures the alarm for WiMax mobile interference devices.                          |
| <b>xbox</b>         | Configures the alarm for Xbox interference devices.                                  |
| <b>zigbee</b>       | Configures the alarm for 802.15.4 interference devices.                              |

### Command Default

The alarm for Wi-Fi inverted devices is enabled. The alarm for all the other devices is disabled.

### Command Modes

Global configuration (config)



**Command History**

| <b>Release</b>     | <b>Modification</b>          |
|--------------------|------------------------------|
| Cisco IOS XE 3.3SE | This command was introduced. |

**Usage Guidelines**

You must enable CleanAir using the **ap dot11 24ghz cleanair** command before you configure this command.

**Examples**

This example shows how to configure the default CleanAir 2.4-GHz interference devices alarm:

```
Controller(config)# default ap dot11 24ghz cleanair alarm device inv
```

## default ap dot11 24ghz cleanair device

To configure the default state of report generation for 2.4-GHz interference devices, use the **default ap dot11 24ghz cleanair device** command in global configuration mode.

```
default ap dot11 24ghz cleanair device {bt-discovery | bt-link | canopy | cont-tx | dect-like | fh | inv |
jammer | mw-oven | nonstd | report | superag | tdd-tx | video | wimax-fixed | wimax-mobile | xbox |
zigbee}
```

### Syntax Description

|                     |  |
|---------------------|--|
| <b>bt-discovery</b> | Configures the alarm for Bluetooth interference devices.                             |
| <b>bt-link</b>      | Configures the alarm for any Bluetooth link.   |
| <b>canopy</b>       | Configures the alarm for canopy interference devices.                                |
| <b>cont-tx</b>      | Configures the alarm for continuous transmitters.                                    |
| <b>dect-like</b>    | Configures the alarm for Digital Enhanced Cordless Communication (DECT)-like phones. |
| <b>fh</b>           | Configures the alarm for 802.11 frequency hopping devices.                           |
| <b>inv</b>          | Configures the alarm for devices using spectrally inverted Wi-Fi signals.            |
| <b>jammer</b>       | Configures the alarm for jammer interference devices.                                |
| <b>mw-oven</b>      | Configures the alarm for microwave ovens.  |
| <b>nonstd</b>       | Configures the alarm for devices using nonstandard Wi-Fi channels.                   |
| <b>superag</b>      | Configures the alarm for 802.11 SuperAG interference devices.                        |
| <b>tdd-tx</b>       | Configures the alarm for Time Division Duplex (TDD) transmitters.                    |
| <b>video</b>        | Configures the alarm for video cameras.  |
| <b>wimax-fixed</b>  | Configures the alarm for WiMax fixed interference devices.                           |
| <b>wimax-mobile</b> | Configures the alarm for WiMax mobile interference devices.                          |
| <b>xbox</b>         | Configures the alarm for Xbox interference devices.                                  |
| <b>zigbee</b>       | Configures the alarm for 802.15.4 interference devices.                              |

### Command Default

The alarm for Wi-Fi inverted devices is enabled. The alarm for all other devices is disabled.

**Command Modes** Global configuration (config).

| <b>Command History</b> | <b>Release</b>     | <b>Modification</b>          |
|------------------------|--------------------|------------------------------|
|                        | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** You must enable CleanAir using the **ap dot11 24ghz cleanair** command before you configure this command.

**Examples** This example shows how to enable CleanAir to report when a video camera interferes:

```
Controller(config)# default ap dot11 24ghz cleanair device video
```

## default ap dot11 24ghz rrm channel cleanair-event

To configure the default Event-Driven radio resource management (EDRRM) state and sensitivity for 2.4-GHz devices, use the **default ap dot11 24ghz rrm channel cleanair-event** command in global configuration mode.

**default ap dot11 24ghz rrm channel cleanair-event** [sensitivity {**high** | **low** | **medium**}]

### Syntax Description

|                    |   |
|--------------------|---|
| <b>sensitivity</b> | Configures the EDRRM sensitivity of the CleanAir event.   |
| <b>high</b>        | Specifies the highest sensitivity to non-Wi-Fi interference as indicated by the Air Quality (AQ) value. |
| <b>low</b>         | Specifies the least sensitivity to non-Wi-Fi interference as indicated by the AQ value.                 |
| <b>medium</b>      | Specifies medium sensitivity to non-Wi-Fi interference as indicated by the AQ value.                    |

### Command Default

EDRRM is disabled and the sensitivity is low.

### Command Modes

Global configuration (config)

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Examples

This example shows how to enable EDRRM and set the default EDRRM sensitivity:

```
Controller(config)# default ap dot11 24ghz rrm channel cleanair-event
Controller(config)# default ap dot11 24ghz rrm channel cleanair-event sensitivity
```

## show ap dot11 5ghz cleanair air-quality summary

To display the CleanAir AQ data for 5-GHz band, use the **show ap dot11 5ghz cleanair air-quality summary** command in user EXEC mode or privileged EXEC mode.

### show ap dot11 5ghz cleanair air-quality summary

This command has no arguments or keywords.

#### Command Modes

User EXEC (>)

Privileged EXEC (#)

#### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

#### Examples

This example shows how to display the CleanAir AQ data for 5-GHz band:

```
Controller# show ap dot11 5ghz cleanair air-quality summary
```

AQ = Air Quality

DFS = Dynamic Frequency Selection

| AP Name           | Channel | Avg AQ | Min AQ | Interferers | DFS |
|-------------------|---------|--------|--------|-------------|-----|
| AP270ca.9b86.4546 | 1       | 99     | 99     | 0           | No  |
| AP2894.0f26.22df  | 6       | 98     | 97     | 0           | No  |
| AP2894.0f58.cc6b  | 11      | 99     | 99     | 0           | No  |
| AP2894.0f39.1040  | 6       | 97     | 97     | 0           | No  |
| AP2894.0f63.c6da  | 11      | 99     | 99     | 0           | No  |
| AP2894.0f58.d013  | 6       | 97     | 97     | 0           | No  |

## show ap dot11 5ghz cleanair air-quality worst

To display the worst AQ data for 5-GHz band, use the **show ap dot11 5ghz cleanair air-quality worst** command in user EXEC mode or privileged EXEC mode.

### show ap dot11 5ghz cleanair air-quality worst

This command has no arguments or keywords.

#### Command Modes

User EXEC (>)

Privileged EXEC (#)

#### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

#### Examples

This example shows how to display the worst AQ data for 5-GHz band:

```
Controller# show ap dot11 5ghz cleanair air-quality worst
```

AQ = Air Quality

DFS = Dynamic Frequency Selection

| AP Name          | Channel | Avg AQ | Min AQ | Interferers | DFS |
|------------------|---------|--------|--------|-------------|-----|
| AP2894.0f39.1040 | 6       | 97     | 97     | 0           | No  |

# show ap dot11 5ghz cleanair config

To display the CleanAir configuration for 5-GHz band, use the **show ap dot11 5ghz cleanair config** command.

## show ap dot11 5ghz cleanair config

This command has no arguments or keywords.

### Command Modes

User EXEC (>)

Privileged EXEC (#)

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Usage Guidelines

In Release 3.3SE, you can configure this command on the Mobility Agent (MA).

### Examples

This example shows how to display the CleanAir configuration for 5-GHz band on the Mobility Controller:

```

Controller# show ap dot11 5ghz cleanair config

CleanAir Solution..... : Enabled
Air Quality Settings:
  Air Quality Reporting..... : Enabled
  Air Quality Reporting Period (min)..... : 15
  Air Quality Alarms..... : Enabled
  Air Quality Alarm Threshold..... : 1
Interference Device Settings:
  Interference Device Reporting..... : Enabled
  TDD Transmitter..... : Enabled
  Jammer..... : Enabled
  Continuous Transmitter..... : Enabled
  DECT-like Phone..... : Enabled
  Video Camera..... : Enabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Enabled
  WiMax Mobile..... : Enabled
  WiMax Fixed..... : Enabled
Interference Device Types Triggering Alarms:
  TDD Transmitter..... : Enabled
  Jammer..... : Enabled
  Continuous Transmitter..... : Enabled
  DECT-like Phone..... : Enabled
  Video Camera..... : Enabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Enabled
  WiMax Mobile..... : Enabled
  WiMax Fixed..... : Enabled
Interference Device Alarms..... : Enabled
Additional CleanAir Settings:
  CleanAir Event-driven RRM State..... : Enabled

```

## show ap dot11 5ghz cleanair config

```
CleanAir Driven RRM Sensitivity..... : HIGH
CleanAir Persistent Devices state..... : Enabled
```

This example shows how to display the CleanAir configuration for 5-GHz band on the Mobility Agent:

```
Controller# show ap dot11 5ghz cleanair config
```

```
Mobility Controller Link Status..... : UP
CleanAir Solution..... : Enabled
Air Quality Settings:
  Air Quality Reporting..... : Enabled
  Air Quality Reporting Period (min)..... : 15
  Air Quality Alarms..... : Enabled
  Air Quality Alarm Threshold..... : 10
Interference Device Settings:
  Interference Device Reporting..... : Enabled
  TDD Transmitter..... : Enabled
  Jammer..... : Enabled
  Continuous Transmitter..... : Enabled
  DECT-like Phone..... : Enabled
  Video Camera..... : Enabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Enabled
  WiMax Mobile..... : Enabled
  WiMax Fixed..... : Enabled
Interference Device Types Triggering Alarms:
  TDD Transmitter..... : Disabled
  Jammer..... : Disabled
  Continuous Transmitter..... : Disabled
  DECT-like Phone..... : Disabled
  Video Camera..... : Disabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Disabled
  WiMax Mobile..... : Disabled
  WiMax Fixed..... : Disabled
Interference Device Alarms..... : Enabled
Additional CleanAir Settings:
  CleanAir Event-driven RRM State..... : Disabled
  CleanAir Driven RRM Sensitivity..... : LOW
  CleanAir Persistent Devices state..... : Disabled
```



## show ap dot11 5ghz cleanair device type

To display the 5-GHz interference devices, use the **show ap dot11 5ghz cleanair device type** command.

```
show ap dot11 5ghz cleanair device type {all | canopy | cont-tx | dect-like | inv | jammer | nonstd |
persistent | superag | tdd-tx | video | wimax-fixed | wimax-mobile}
```

### Syntax Description

|                     |   |
|---------------------|---|
| <b>all</b>          | Displays all CleanAir interferer devices for 5-GHz band.  |
| <b>canopy</b>       | Displays CleanAir interferers of type canopy for 5-GHz band.  |
| <b>cont-tx</b>      | Displays CleanAir interferers of type continuous transmitter for 5-GHz band.                                    |
| <b>dect-like</b>    | Displays CleanAir interferers of type Digital Enhanced Cordless Communication (DECT)-like phone for 5-GHz band. |
| <b>inv</b>          | Displays CleanAir interferer devices using spectrally inverted WiFi signals for 5-GHz band.                     |
| <b>jammer</b>       | Displays CleanAir interferers of type jammer for 5-GHz band.  |
| <b>nonstd</b>       | Displays CleanAir interferer devices using non-standard Wi-Fi channels for 5-GHz band.                          |
| <b>persistent</b>   | Displays CleanAir persistent device interferers for 5-GHz band.   |
| <b>superag</b>      | Displays CleanAir interferers of type SuperAG for 5-GHz band.   |
| <b>tdd-tx</b>       | Displays CleanAir Time Division Duplex (TDD) transmitters for 5-GHz band.                                       |
| <b>video</b>        | Displays CleanAir interferers of type video camera for 5-GHz band.  |
| <b>wimax-fixed</b>  | Displays CleanAir interferers of type WiMax fixed for 5-GHz band.   |
| <b>wimax-mobile</b> | Displays CleanAir interferers of type WiMax mobile for 5-GHz band.  |

### Command Modes

User EXEC (>)  
Privileged EXEC (#)

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

Interference devices are listed only if there is an interference from any 5-GHz devices.

**Examples**

This example shows how to view all the 5-GHz interference devices:

```
Controller# 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
```

| No      | ClusterID | DevID | Type | AP Name | ISI | RSSI | DC |
|---------|-----------|-------|------|---------|-----|------|----|
| Channel |           |       |      |         |     |      |    |

-----

# show ap dot11 24ghz cleanair air-quality summary

To display the CleanAir AQ data for 2.4-GHz band, use the **show ap dot11 24ghz cleanair air-quality summary** command in user EXEC mode or privileged EXEC mode.

## show ap dot11 24ghz cleanair air-quality summary

This command has no arguments or keywords.

### Command Modes

User EXEC (>)

Privileged EXEC (#)

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Examples

This example shows how to display the CleanAir AQ data for 2.4-GHz band:

```
Controller# show ap dot11 24ghz cleanair air-quality summary
```

AQ = Air Quality

DFS = Dynamic Frequency Selection

| AP Name           | Channel | Avg AQ | Min AQ | Interferers | DFS |
|-------------------|---------|--------|--------|-------------|-----|
| AP270ca.9b86.4546 | 1       | 99     | 99     | 0           | No  |
| AP2894.0f26.22df  | 6       | 98     | 97     | 0           | No  |
| AP2894.0f58.cc6b  | 11      | 99     | 99     | 0           | No  |
| AP2894.0f39.1040  | 6       | 97     | 97     | 0           | No  |
| AP2894.0f63.c6da  | 11      | 99     | 99     | 0           | No  |

## show ap dot11 24ghz cleanair air-quality worst

To display the worst air quality data for 2.4-GHz band, use the **show ap dot11 24ghz cleanair air-quality worst** command in user EXEC mode or privileged EXEC mode.

### show ap dot11 24ghz cleanair air-quality worst

This command has no arguments or keywords.

#### Command Modes

User EXEC (>)

Privileged EXEC (#)

#### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

#### Examples

This example shows how to display the worst AQ data for 2.4-GHz band:

```
Controller# show ap dot11 24ghz cleanair air-quality worst
```

AQ = Air Quality

DFS = Dynamic Frequency Selection

| AP Name          | Channel | Avg AQ | Min AQ | Interferers | DFS |
|------------------|---------|--------|--------|-------------|-----|
| AP2895.0f39.1040 | 6       | 97     | 97     | 0           | No  |

# show ap dot11 24ghz cleanair config

To display the CleanAir configuration for 2.4-GHz band, use the **show ap dot11 24ghz cleanair config** command in user EXEC mode or privileged EXEC mode.

## show ap dot11 24ghz cleanair config

This command has no arguments or keywords.

### Command Modes

User EXEC (>)

Privileged EXEC (#)

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

### Usage Guidelines

In Release 3.3SE, you can configure this command on the Mobility Agent (MA).

### Examples

This example shows how to display the CleanAir configuration for 2.4-GHz band on the Mobility Controller:

```
Controller# show ap dot11 24ghz cleanair config
```

```
CleanAir Solution..... : Enabled
Air Quality Settings:
  Air Quality Reporting..... : Enabled
  Air Quality Reporting Period (min)..... : 15
  Air Quality Alarms..... : Enabled
  Air Quality Alarm Threshold..... : 1
Interference Device Settings:
  Interference Device Reporting..... : Enabled
  TDD Transmitter..... : Enabled
  Jammer..... : Enabled
  Continuous Transmitter..... : Enabled
  DECT-like Phone..... : Enabled
  Video Camera..... : Enabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Enabled
  WiMax Mobile..... : Enabled
  WiMax Fixed..... : Enabled
Interference Device Types Triggering Alarms:
  TDD Transmitter..... : Enabled
  Jammer..... : Enabled
  Continuous Transmitter..... : Enabled
  DECT-like Phone..... : Enabled
  Video Camera..... : Enabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Enabled
  WiMax Mobile..... : Enabled
  WiMax Fixed..... : Enabled
Interference Device Alarms..... : Enabled
Additional CleanAir Settings:
```

## show ap dot11 24ghz cleanair config

```

CleanAir Event-driven RRM State..... : Enabled
CleanAir Driven RRM Sensitivity..... : HIGH
CleanAir Persistent Devices state..... : Enabled

```

This example shows how to display the CleanAir configuration for 2.4-GHz band on the Mobility Agent:

```

Controller# show ap dot11 24ghz cleanair config

Mobility Controller Link Status..... : UP
CleanAir Solution..... : Enabled
Air Quality Settings:
  Air Quality Reporting..... : Enabled
  Air Quality Reporting Period (min)..... : 15
  Air Quality Alarms..... : Enabled
  Air Quality Alarm Threshold..... : 10
Interference Device Settings:
  Interference Device Reporting..... : Enabled
  TDD Transmitter..... : Enabled
  Jammer..... : Enabled
  Continuous Transmitter..... : Enabled
  DECT-like Phone..... : Enabled
  Video Camera..... : Enabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Enabled
  WiMax Mobile..... : Enabled
  WiMax Fixed..... : Enabled
Interference Device Types Triggering Alarms:
  TDD Transmitter..... : Disabled
  Jammer..... : Disabled
  Continuous Transmitter..... : Disabled
  DECT-like Phone..... : Disabled
  Video Camera..... : Disabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Disabled
  WiMax Mobile..... : Disabled
  WiMax Fixed..... : Disabled
Interference Device Alarms..... : Enabled
Additional CleanAir Settings:
  CleanAir Event-driven RRM State..... : Disabled
  CleanAir Driven RRM Sensitivity..... : LOW
  CleanAir Persistent Devices state..... : Disabled

```

# show ap dot11 24ghz cleanair summary

To display a summary of 2.4-GHz CleanAir devices, use the **show ap dot11 24ghz cleanair summary** command in user EXEC mode or privileged EXEC mode.

## show ap dot11 24ghz cleanair summary

This command has no arguments or keywords.

### Command Modes

User EXEC (>)

Privileged EXEC (#)

### Command History

| Release            | Modification                 |
|--------------------|------------------------------|
| Cisco IOS XE 3.3SE | This command was introduced. |

### Examples

This is an example of output from the **show ap dot11 24ghz cleanair summary** command:

Controller# **show ap dot11 24ghz cleanair summary**

| AP Name<br>Spectrum Oper State | MAC Address    | Slot ID | Spectrum Capable | Spectrum Intelligence |
|--------------------------------|----------------|---------|------------------|-----------------------|
| AP1cdf.0f95.1719<br>Down       | 0817.35c7.1a60 | 0       | Disabled         | Disabled              |
| AS-5508-5-AP3<br>Down          | 0817.35dd.9f40 | 0       | Disabled         | Disabled              |
| AP270ca.9b86.4546<br>Up        | 0c85.259e.c350 | 0       | Enabled          | Enabled               |
| AP2894.0f26.22df<br>Up         | 0c85.25ab.cca0 | 0       | Enabled          | Enabled               |
| AP2894.0f58.cc6b<br>Up         | 0c85.25c7.b7a0 | 0       | Enabled          | Enabled               |
| AP2894.0f39.1040<br>Up         | 0c85.25de.2c10 | 0       | Enabled          | Enabled               |
| AP2894.0f63.c6da<br>Up         | 0c85.25de.c8e0 | 0       | Enabled          | Enabled               |

```
show ap dot11 24ghz cleanair summary
```