



## Dynamic Frequency Selection

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## Feature History for Channel Availability Check (CAC)

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

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

**Table 1: Feature History for Channel Availability Check (CAC)**

Release	Feature	Feature Information
Cisco IOS XE Bengaluru 17.5.1	Channel Availability Check (CAC)	When a DFS channel is selected for an AP radio, the AP radio scans the channel to check for any radar signals before transmitting any frames in the DFS frequency. This process is called Channel Availability Check (CAC).

## Information About Dynamic Frequency Selection

Dynamic Frequency Selection (DFS) is the process of detecting radar signals and automatically setting the frequency on a DFS-enabled 5.0-GHz (802.11a/h) radio to avoid interference with the radar signals. Radios configured for use in a regulatory domain must not interfere with radar systems.

In normal DFS, when a radar signal is detected on any of the channels in the 40-MHz or 80-MHz bandwidth, the whole channel is blocked. With Flex DFS, if the radar signals are not detected on the secondary channel, the AP is moved to a secondary channel with a reduction in the bandwidth, usually, by half.

## Information About Channel Availability Check (CAC)

When a DFS channel is selected for an AP radio, the AP radio scans the channel to check for any radar signals before transmitting any frames in the DFS frequency. This process is called Channel Availability Check (CAC).




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**Note** CAC is executed before you set a DFS channel for the radio.

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If the AP detects that a radar is using a specific DFS channel, the AP marks the channel as non-available and excludes it from the list of available channels. This state lasts for 30 minutes after which the AP checks again to see, if the channel can be used for Wi-Fi transmissions.




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**Note**

- The CAC performed during a boot process takes anywhere between 1 and 10 minutes depending on the country. This is the reason as to why the DFS channels are not available immediately when an AP reboots.
- APs in the ETSI domain scan channels which are not supported by the controller, as the hardware has the ability to scan.

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## Verifying DFS

Use the following commands to verify the DFS configuration:

To display the 802.11h configuration, use the following command:

```
Device# show wireless dot11h
```

To display the auto-rF information for 802.11h configuration, use the following command:

```
Device# show ap auto-rf dot11 5ghz
```

To display the auto-rF information for a Cisco AP, use the following command:

```
Device# show ap name ap1 auto-rf dot11 5gh
```

To display the channel details for a Cisco AP, use the following command:

```
Device# show ap dot11 5ghz summary
AP Name Mac Address Slot Admin State Oper State Width Txpwr Channel
-----
pnp-ap 04eb.409e.b560 1 Enabled Up 40 *8/8 (3 dBm) (52,56)
BLDG1-9130-RACK-1568 04eb.409f.11a0 1 Disabled Down 40 4/8 (15 dBm) (100,104)#
```



**Note** In the show command, # is added right next to the channel whenever CAC is running on an AP radio.

## Information About Zero Wait Dynamic Frequency Selection

Access points (APs) monitor and perform Channel Availability Check (CAC) on a potential channel for 60 seconds when AP moves to Dynamic Frequency Selection (DFS) channels. Further, the AP ensures that there is no radar operating in the same frequency range before advertising beacons and serving clients. When the AP moves to a DFS, there is a service outage for a minute. This outage can be higher and extend up to 10 minutes. The Zero Wait Dynamic Frequency Selection feature helps to avoid the service outage in regulatory domains. As of now, U.S. and Europe are the only supported domains.

## Configuring Zero Wait Dynamic Frequency Selection Globally (CLI)

### 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>ap dot11 5ghz rrm channel zero-wait-dfs</b>  <b>Example:</b> Device(config)# ap dot11 5ghz rrm channel zero-wait-dfs	Enables the Zero Wait Dynamic Frequency Selection feature. By default, the feature is disabled.  Use the <b>no</b> form of this command to disable the feature.  <b>Note</b> The Zero Wait Dynamic Frequency Selection feature is only available on a 5-GHz radio.

## Configuring Zero Wait Dynamic Frequency Selection Globally (GUI)

### Procedure

- Step 1** Choose **Configuration > Radio Configurations > RRM**.
- Step 2** In the **RRM** page, click the **5 GHz Band** tab.

- Step 3** Click the **DCA** tab.
- Step 4** Select the **Zero Wait DFS** check box to allow the AP to change to DFS without a service outage.
- Step 5** Click **Apply**.

## Enabling Zero Wait Dynamic Frequency Selection on a RF Profile (CLI)

### 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>ap dot11 5ghz rf-profile profile-name</b>  <b>Example:</b> Device(config)# ap dot11 5ghz rf-profile test-dfs	Configures a radio frequency (RF) profile and enters RF profile configuration mode.
<b>Step 3</b>	<b>channel zero-wait-dfs</b>  <b>Example:</b> Device(config-rf-profile)# channel zero-wait-dfs	Enables the Zero Wait Dynamic Frequency Selection feature for the RF profile.  Use the <b>no</b> form of this command to disable the feature.

## Enabling Zero Wait Dynamic Frequency Selection on a RF Profile (GUI)

### Procedure

- Step 1** Choose **Configuration > Tags & Profiles > RF/Radio**.
- Step 2** In the **RF** tab, click **Add**.  
The **Add RF Profile** page is displayed.
- Step 3** Enter the name for the RF profile.
- Step 4** From the **Radio Band** drop-down, choose the **5 GHz** band.
- Step 5** Click the **RRM** tab.
- Step 6** Click the **DCA** tab.
- Step 7** Select the **Zero Wait DFS** check box to allow the AP to change to DFS without a service outage.

**Step 8** Click **Apply to Device**.

## Verifying Zero Wait Dynamic Frequency Selection Configuration

Use the following commands to verify the DFS configuration.

To display the Zero Wait DFS configuration on an AP, use the following command:

```
Device# show ap name ap1 config slot 1 | inc Zero
```

```
Zero Wait DFS Parameters
Zero Wait DFS Capable      : Yes
CAC Domain                  : None
```

To display the global configuration related to the Zero Wait Dynamic Frequency Selection feature, use the following command:

```
Device# show ap dot11 5ghz channel | inc Zero
```

```
Zero Wait DFS Parameters
Zero Wait DFS Capable      : Yes
CAC Domain                  : None
```

To display the RF profile configuration related to the Zero Wait Dynamic Frequency Selection feature, use the following command:

```
Device# show ap rf-profile name test detail | sec Zero
```

```
Description                :
RF Profile Name             : test
Band                        : 5 GHz
Transmit Power Threshold v1 : -70 dBm
Min Transmit Power          : -10 dBm
Max Transmit Power          : 30 dBm
.
.
Guard Interval              : default
Zero Wait DFS                : Enabled
```

