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Cisco Catalyst IW9165E Access Points

The Cisco Catalyst IW9165E Access Point is a rugged wireless device designed to deliver ultra-reliable connectivity for moving vehicles and industrial machines.

- 2x2 Wi-Fi 6E design with external antennas for advanced wireless performance.
- IP30-rated durable construction for use in industrial and rugged environments.
- Low power consumption and compact form factor for easy integration into industrial assets.

Key features and industrial integration

The Catalyst IW9165E Access Points are specifically engineered to integrate seamlessly into industrial assets, thanks to their compact form factor and robust construction.

- Wi-Fi 6E Technology: Supports the latest wireless standards for improved performance and reliability.
- External Antennas: Provides enhanced signal strength and coverage.
- Durable Design: IP30-rated for use in rugged environments.
- Low Power Consumption: Optimized for energy efficiency.
- Compact Form Factor: Simplifies integration into industrial machines and moving vehicles.

These attributes make the Catalyst IW9165E APs a reliable choice for enabling wireless connectivity in demanding industrial settings.

Cisco Unified Industrial Wireless software releases information

The Cisco Unified Industrial Wireless (UIW) Software releases provide enhanced functionality for the Catalyst IW9165E , enabling it to operate in multiple modes for diverse industrial networking needs.

Features and operational modes

These updates are designed to deliver high availability, low latency, and seamless connectivity across various infrastructure setups, making the Catalyst IW9165E a versatile solution for industrial wireless networking.

Table 1: Operating modes and features

Mode	Introduced in Release	Functionality	Application
CURWB	17.12.1	Provides Cisco ultra-reliable wireless backhaul (CURWB) with low latency, zero packet loss, and seamless handoffs.	Mission-critical industrial applications.
WGB	17.13.1	Connects wired clients to Cisco AP infrastructure as a Wi-Fi client.	Cisco-based wireless environments.
uWGB	17.13.1	Connects wired clients to third-party AP infrastructure as a Wi-Fi client.	Third-party wireless environments. Both modes (WGB and uWGB) help in bridging the wired clients behind the WGB to the infrastructure's AP.
CAPWAP	17.14.1	Operates as a lightweight AP using the CAPWAP protocol.	Flexible AP management and deployment.

Note The IW9165E allows you to change its operating mode to CAPWAP, WGB, or URWB by simply updating its software, without replacing the hardware.

CAPWAP modes

CAPWAP modes are operational configurations that define how access points (APs) interact with wireless controllers and the network infrastructure.

- Each mode determines how the AP processes client traffic and performs network functions.

- Modes include Local, FlexConnect, Fabric, Sniffer, Monitor, and Site Survey.
- Modes are selected based on network requirements such as centralized management, resiliency, segmentation, monitoring, or RF analysis.

Modes of operation and their characteristics

CAPWAP modes categorize the operational behavior of APs in a network, affecting traffic handling, management, and additional wireless functions.

Table 2: CAPWAP Modes Comparison Table

Mode	Description	Key Features	Use Case
Local Mode	Default mode where AP serves clients and centralizes traffic through CAPWAP tunnels.	• Creates two CAPWAP tunnels. • Central switching (data bridges to controller).	Centralized traffic management.
FlexConnect	AP switches traffic locally while Controller manages it, ensuring operation even if Controller connection is lost.	• Local traffic switching. • Operates like an autonomous AP. • Resilient to Controller disconnection.	Resiliency and local traffic handling in branch offices or remote sites.
Fabric	AP establishes a VxLAN tunnel to the fabric edge, ensuring network segmentation.	• Maintains segmentation to AP. • Inserts SGT into VxLAN traffic. • Supports EN and PEN nodes.	Segmentation and secure communication in fabric-based networks.
Sniffer	AP captures air traffic on a specific channel for analysis using tools like Wireshark.	• Forwards packets to remote analysis tools. • Tags traffic with SGT during transit.	Network troubleshooting and packet analysis.
Monitor	AP acts as a sensor for LBS, rogue AP detection, and IDS without handling client traffic.	• Dedicated airwave monitoring. • Does not serve clients.	Security monitoring and intrusion detection.

Mode	Description	Key Features	Use Case
Site survey	AP used to configure RF parameters for site surveys. For information, see the AP Survey Mode section in the Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide .	Assists in RF analysis.	RF analysis for wireless planning.



Note Sniffer mode: Ensure both server and Controller must be on the same VLAN to avoid errors.

Functionalities of each CAPWAP mode

- Local mode: Default mode, two CAPWAP tunnels, central switching.
- FlexConnect mode: Local switching, behaves like an autonomous AP, works even if the controller is unavailable.
- Fabric mode: VxLAN tunnel to fabric edge, supports segmentation, SGT tagging.
- Sniffer mode: Captures packets, sends to analysis tools, tags traffic with SGT.
- Monitor mode: Acts as a sensor, no client traffic, supports LBS, IDS, rogue AP detection.
- Site survey mode: Used for RF configuration during site surveys.

Unsupported features

- 2.4 GHz radio, and
- Scan radio.

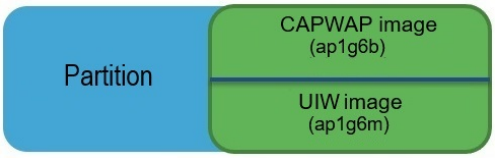
For more information about how to configure the AP on the Controller, see Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide.

Determine the correct software image for the AP

Before you begin

Select the correct AP software image for the AP based on its mode of operation. This ensures proper functionality and compatibility of the device.

Software images for the AP are stored in various folders within the same section of the device. Each image corresponds to a specific AP mode, such as CAPWAP, URWB, or WGB/uWGB.



Procedure

Step 1 Locate the software images.

Navigate to the section where software images are stored on the AP. Ensure you have access to the appropriate folders containing the images.

Step 2 Identify the AP's mode.

Determine the operational mode of the AP. The device can operate in one of the following modes:

- CAPWAP
- URWB
- WGB or uWGB

Step 3 Select the corresponding software image.

Choose the software image that matches the device's mode of operation. Refer to the table below for the appropriate software image:

IW9165E mode	Software image
CAPWAP	`ap1g6b-k9w8-xxx.tar`
URWB	`UIW image ap1g6m-k9c1-xxx.tar`
WGB or uWGB	

Verify software running on the AP

You can use the **show version** command to determine the image running on AP.

- If the output is shown as **Cisco AP Software, (ap1g6b)** ; AP is running with the CAPWAP mode.

```
Cisco AP Software, (ap1g6b), C9165, RELEASE SOFTWARE
           Technical Support: http://www.cisco.com/techsupport
           Copyright (c) 1986-2024 by Cisco Systems, Inc.
           Compiled Tue Feb 20 23:04:29 GMT 2024
```

- If the output is shown as **Cisco AP Software (ap1g6m)** ; AP is running with the URWB mode or WGB/uWGB.

```
Cisco AP Software, (ap1g6m), C9165, RELEASE SOFTWARE
           Technical Support: http://www.cisco.com/techsupport
```

```
Copyright (c) 1986-2024 by Cisco Systems, Inc.
Compiled Tue Feb 20 23:04:29 GMT 2024
```

Convert the AP image between Wi-Fi, URWB, and WGB modes

Perform this task to convert the AP's image between Wi-Fi (CAPWAP), URWB, and WGB modes. Image conversion is necessary to adapt the AP to different operational environments or network requirements.

Before you begin

Warning Image conversion performs a full factory reset, that erases all configurations and data on the device.

Procedure

Step 1 Use the **configure boot mode urwb** command to convert from CAPWAP to URWB mode or from WGB/uWGB to URWB mode.

```
Device# configure boot mode urwb
```

Or

Step 2 Use the **configure boot mode capwap** command to convert from URWB to CAPWAP mode or from WGB/uWGB to CAPWAP mode.

```
Device# configure boot mode capwap
```

Or

Step 3 Use the **configure boot mode wgb** command to convert from CAPWAP to WGB/uWGB mode or from URWB to WGB/uWGB mode.

```
Device# configure boot mode wgb
```

Note
Once you perform these commands, the AP will reboot, and the new configuration will take effect.

Connect the computer to the AP console port

Perform this task to configure an access point locally without connecting it to a wired LAN. This access enables you to use the CLI and execute the configuration commands required for setup.

Before you begin

This task is applicable when direct access to the access point through a wired network is unavailable or unnecessary. You need a DB-9 to RJ-45 serial cable and a terminal emulator application to complete the task.

Procedure

Step 1 Connect the serial cable to the AP and computer.

- Attach a nine-pin, female DB-9 to RJ-45 serial cable to the RJ-45 serial port on the AP.
- Connect the other end of the cable to the COM port on your computer.

Step 2 Configure the terminal emulator.

- Launch a terminal emulator application on your computer.
- Configure the terminal emulator with these settings:

Parameter	Value
Baud rate	115200 bps
Data bits	Eight bits
Parity	No parity
Stop bits	One stop bit
Flow control	No flow control

Step 3 Log In to the AP.

- Upon connecting, two command-prompt modes are available:
  - Standard Command Prompt (`>`)
  - Privileged Command Prompt (`#`)
- When you log in for the first time, the CLI shows the standard command prompt (>) for unprivileged commands.
- To switch to the privileged command prompt (#), enter the `enable` command (or its abbreviation `en`) and provide the enable password.

Step 4 Use default credentials to login.

- Username: `Cisco`
- Password: `Cisco`

Note
After the initial configuration completes, remove the serial cable from the AP.

Related documentation

This topic provides links to related documentation and support information for the Cisco Catalyst IW9165 Rugged Series.

To view all support information for the Cisco Catalyst IW9165 Rugged Series, see https://www.cisco.com/content/en/us/support/wireless/catalyst-iw9165-rugged-series/series.html .

In addition to the documentation available on the support page, you will need to refer to these guides:

- For information about IW9165E hardware, see Cisco Catalyst IW9165E Rugged Access Point and Wireless Client Hardware Installation Guide .
- A full listing of the AP's features and specifications is provided in Cisco Catalyst IW9165 Series Data Sheet .
- For information about Cisco URWB mode configuration, see the relevant documents at:

  https://www.cisco.com/content/en/us/support/wireless/catalyst-iw9165-rugged-series/series.html .
- For more information about the configuration on Cisco Catalyst 9800 Series Wireless Controllers, see Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide .