

Designing and Configuring AVoIP for Cisco Room Device Accessories

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Document Overview

This document provides a comprehensive overview of the accessory (link-local) network architecture within the Cisco Room Device portfolio. Cisco Room Devices include Video Bars, Boards, Integrated Systems, and Integrator Codecs, all of which support a range of Cisco Room Accessories such as controllers, microphones, and cameras.

These accessories connect to Room Devices via Ethernet cabling. Depending on the accessory type, the Ethernet connection may carry control signals, audio, and/or video over IP (AVoIP). This document explains the operational behavior of the accessory network and outlines supported Cisco topologies for expanding it.

Additionally, this guide includes configuration examples for the following switch platforms to facilitate successful deployments:

- Cisco Catalyst 1200 Series
- Cisco Catalyst 9200 Series

The scope of this document is limited to Cisco Room Devices that support at least one accessory utilizing AVoIP functionality.

Room Device Onboard Accessory Network

Room Device Onboard Accessory Network Overview

This section outlines the Ethernet port requirements for currently supported Room Accessories and details the port capabilities of the Room Devices with which they are compatible. It also provides an in-depth description of the onboard accessory (link-local) network available on all Room Devices that support AVoIP.

Room Device Accessory Introduction

The following tables list the supported Ethernet-connected Room Accessories and the corresponding Room Devices that support some or all of these accessories. For complete specifications, configuration guidelines, and exact compatibility details, consult the official product documentation for each Room Device and Accessory.

Table 1: Ethernet-connected Room Accessories

Control Only	AVoIP + Control
Navigator (Table and Wall)	Table Microphone Pro
Precision 60 Camera	Ceiling Microphone Pro
Quad Camera	Room Vision PTZ
PTZ 4K Camera	

*For a complete list of Room Accessories, please visit <https://www.webex.com/us/en/devices/accessories.html>

Table 2: Room Devices that Support Cisco AVoIP Accessories

Bars	Boards	Integrated Systems	Integrator Codecs
Room Bar	Board Pro G1	Room Kit EQX	Codec EQ
Room Bar Pro	Board Pro G2	Room Kit Panorama	Codec Pro

*The number and type of Room Accessories supported by each Room Device are subject to hardware and software limitations. For current accessory compatibility and support limits and a complete list of Room Devices, refer to the official Cisco Devices page at <https://www.webex.com/us/en/devices.html>

Onboard Accessory Network Introduction

The onboard accessory network, also referred to as the link-local network (LLN), consists of the physical Ethernet port(s) on a Room Device that support direct connection to Ethernet-based Room Accessories. While Room Devices connect to management platforms such as Cisco Webex Control Hub, Cisco Expressway, or Cisco Unified Communications Manager via their primary LAN port, select models also include an integrated accessory switch with one to four dedicated ports. These ports collectively form the onboard accessory network.

AVoIP traffic generated by connected accessories is processed in the Room Device and transmitted via the LAN port, integrating into calling, meeting, and other collaboration workloads, depending on device configuration.

When planning to use the onboard accessory network, consider both the physical port availability and Power over Ethernet (PoE) capacity of the Room Device's onboard switch. Additionally, evaluate whether visibility to management platforms beyond Cisco Webex Control Hub is required, as this may influence network design decisions.

This document provides detailed information on onboard accessory network behavior, including physical and PoE specifications for each supported Room Device.

Onboard Accessory Network Operation

The onboard accessory network of a Room Device enables simple plug-and-play (PnP) pairing for supported Room Accessories. In addition to native accessories, select third-party peripherals and Ethernet switches may also be connected to the onboard accessory ports. Guidance for extending the accessory network using an external switch is provided later in this document. Note that integration of third-party accessories is outside the scope of this guide.

*For a complete list of certified third-party accessories and peripherals, refer to the Cisco Collaboration Devices Certification Program at:

<https://help.webex.com/en-us/article/7sw4gab/Cisco-collaboration-devices-certification-program>

Some certified devices may require specific configuration steps or environmental considerations. Please consult the appropriate product integration guides for details.

The onboard accessory network operates strictly at Layer 2 and does not support user-defined configurations. The Room Device functions as a DHCP server within this network and reserves a specific range of IP addresses for static configuration.

The Room Device's onboard accessory switch consistently assigns itself the IP address 169.254.1.1.

Connected devices requiring IP access must use addresses within the 169.254.0.0/24 subnet and comply with predefined rules regarding dynamic and static assignment. The table below

outlines the IP address ranges reserved for DHCP allocation and those available for static assignment.

Table 3: Onboard Accessory Network IP Addressing

Device	IP Address Range	Method
Room Device	169.254.1.1	Static and unconfigurable
Third Party (1st) Device	169.254.1.30	DHCP
Cisco Accessories	169.254.1.41 - 169.254.1.200	DHCP
Third Party (2nd - 31st) Device	169.254.1.225 - 169.254.1.254	Static

Onboard Accessory PoE Introduction

When determining how to utilize the onboard accessory network, it is essential to evaluate the Power over Ethernet (PoE) capabilities of the Room Device. If the Room Device does not provide sufficient PoE to support connected accessories, external power must be supplied to those accessories. This can be achieved either through individual power adapters or by incorporating a PoE-capable Ethernet switch.

This section outlines available external power options. Guidance for using PoE-enabled switches is provided in the *Extending the Accessory Network* section.

Onboard Accessory PoE Operation

Proper planning for Room Accessory deployments must include consideration of the Room Device's total PoE budget and the maximum PoE output per port. Exceeding these limits can result in accessories failing to power on or operating unreliably.

Refer to the table below for details on onboard accessory port counts and the corresponding PoE capacity available for each supported Room Device.

Table 4: Room Device Onboard Accessory and Port Capacity

Room Device	Total Acc. Ports	PoE Capable Acc. Ports	Per Port Budget	Total Budget
Room Bar	1	1	15.4 W	15.4 W
Room Bar Pro	3	3	15.4 W	60 W
Board Pro G1	1	1	15.4 W	15.4 W
Board Pro G2	2	1	15.4 W	15.4 W
Codec EQ	4	4	90 W	90 W
Kit EQX	4	4	90 W	90 W
Codec Pro	4	2	15.4 W	35 W
Panorama	4	2	15.4 W	35 W

* Room Kit EQ, Kit EQX, Kit Pro, and Room Panorama are built on either the Codec EQ or Codec Pro platform. The accessories included with these bundles are designed to connect

directly to the codec's onboard accessory switch, though this is not a strict requirement. When this deployment option is used, note that the number of usable ports may be lower than the "Total Acc Ports" value listed in the port and PoE capacity chart above. Room Panorama includes a Cisco PoE-enabled switch as part of the standard bundle to support additional accessory connectivity. For guidance on increasing the number of available ports and PoE capacity for these and other Room Devices, refer to the *Extending the Accessory Network* section.

The total power requirements of all connected Room Accessories must be evaluated against the PoE capacity of the corresponding Room Device to determine whether external power is required. If the cumulative demand exceeds the Room Device's PoE budget, accessories may require independent power sources or the use of a PoE-capable switch.

PoE requirements for accessories can be specified using various methods. The table below provides a standardized summary based on the IEEE 802.3af (PoE), 802.3at (PoE+), and 802.3bt (PoE++) power classifications.

Table 5: 802.3 Power Delivery

Class	IEEE Standard	Max Watts	Watts Delivered	Voltage Range	Voltage Delivered
0	802.3af, PoE	15.4 W	12.95 W	37-57 V	44-57 V
1	802.3af, PoE	4 W	3.84 W	37-57 V	44-57 V
2	802.3af, PoE	7 W	6.49 W	37-57 V	44-57 V
3	802.3af, PoE	15.4 W	12.95 W	37-57 V	44-57 V
4	802.3at, PoE+	30 W	25.5 W	42 - 57 V	50 - 57 V
5	802.3bt, type 3	45 W	40 W	42 - 57 V	50 - 57 V
6	802.3bt, type 3	60 W	51 W	42 - 57 V	50 - 57 V
7	802.3bt, type 4	75 W	62 W	51 - 57 V	52 - 57 V
8	802.3bt, type 4	90 W	73 W	51 - 57 V	52 - 57 V

The power requirements for Room Device Accessories are summarized in the table below. Each accessory's specific power source whether PoE, external power supply, or both, varies by device model. When assessing power needs, refer to the Room Device's available PoE Budget to ensure sufficient capacity.

Note that PoE-enabled switches allocate the full PoE budget for each connected Room Accessory, regardless of the actual power consumed by the device.

Table 6: Cisco Room Accessory PoE Requirements

Accessory	PoE	PoE Budget	PoE Consumption	Power Supply
Navigator (Table and Wall)	Required	Class 0 (15.4w)	Up to 8w	No

Precision 60 Camera	No	N/A	N/A	Required
Quad Camera	No	N/A	N/A	Required
PTZ 4K Camera	Optional	Class 4 (30 W)	Up to 24 W	Optional
Table Microphone Pro	Required	Class 2 (7 W)	5 W	No
Ceiling Microphone Pro	Required	Class 3 (15.4 W)	Up to 11 W	No
Room Vision PTZ	Optional	Class 4 (30 W)	Up to 24 W	Optional

Room Device Ethernet Port Layout

The diagrams below depict the layout of accessory port(s) and the LAN port for each AVoIP-capable Room Device. Images displayed above or below each port, such as touch panels or cameras, are illustrative examples of typical Room Accessories that can be connected. However, all ports labeled with “LLN” (link-local network) belong to the same accessory network, and connecting accessories as indicated by the images is not mandatory.

In general, ports labeled “PoE” or associated with a touch panel in the diagram indicate PoE capability. Ports depicted with a camera only do not support PoE.

To determine the maximum power output for each PoE-capable port, as well as the overall PoE budget of the Room Device, refer to *Table 4: Room Device Onboard Accessory and Port Capacity*.

Figure 1: Codec EQ Accessory and LAN Ports

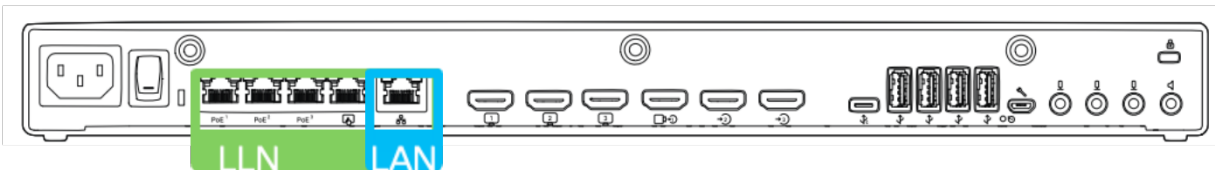


Figure 2: Codec Pro Accessory and LAN Ports

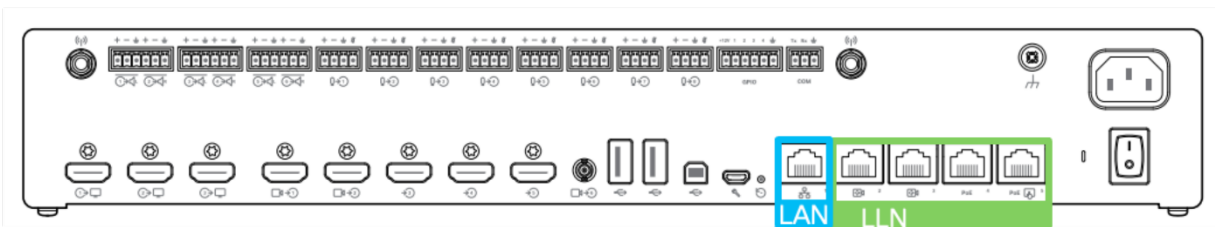


Figure 3: Board Pro G2 Accessory and LAN Ports

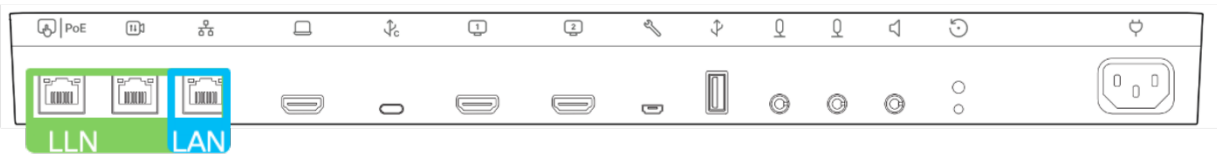


Figure 4: Board Pro G1 Accessory and LAN Ports



Figure 5: Room Bar Pro Accessory and LAN Ports

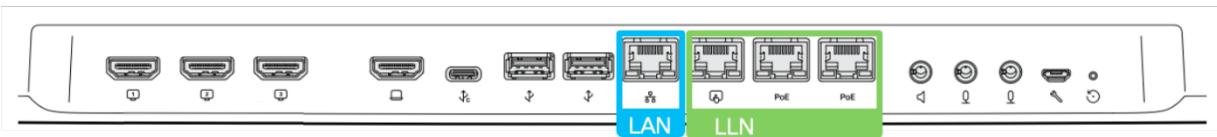
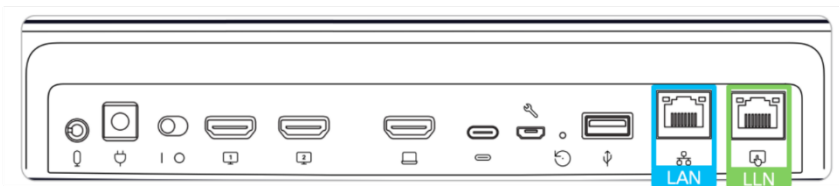


Figure 6: Room Bar Accessory and LAN Ports



Inline Power Injection

When a Room Accessory requires PoE and neither the Room Device's onboard switch nor an external PoE-capable switch can provide it, an inline power injector offers a supported alternative for delivering power. This method enables PoE functionality by passively supplying power through the Ethernet cable using a standard electrical outlet.

The Cisco AIR-PWRINJ6 inline power injector supports up to 30 watts of output, which is sufficient for all currently supported PoE-capable Room Accessories.

*For additional product details and deployment guidance, refer to the official documentation: https://www.cisco.com/c/en/us/td/docs/wireless/access_point/power/guide/air_pwrinj6.html

Extending the Accessory Network

Extending the Accessory Network Overview

When the onboard accessory switch of a Room Device does not provide sufficient port availability or is otherwise unsuitable for a given deployment, the accessory network can be extended by connecting one Ethernet switch to the Room Device's onboard accessory port(s).

An extended accessory network is defined as any deployment of one switch is connected to the Room Device's onboard accessory switch to support additional Room Accessories.

This section outlines the key considerations for extending the accessory network, including:

- Common use cases and deployment drivers
- Guidelines for selecting an appropriate switch
- Supported network topologies for switch-based accessory expansion

Drivers for Extending the Accessory Network Introduction

There are multiple factors that may necessitate or justify extending the Room Device accessory network. Cisco recommends assessing both the capabilities of the Room Device and the specific requirements of the deployment environment to determine whether an extended accessory network is required or preferred.

Port Capacity

If the onboard accessory switch does not provide enough ports to support the required Room Accessories, it is necessary to extend the accessory network. To assess port availability, refer to *Table 4: Room Device Onboard Accessory and Port Capacity* in the *Room Device Onboard Accessory Network* section of this document.

PoE Capacity

Even when sufficient physical ports are available, a Room Device may lack the necessary Power over Ethernet (PoE) capacity per port or across the device to power all connected accessories. In such cases, Cisco recommends extending the accessory network with a PoE-capable switch.

To determine whether a PoE switch is required, consult *Table 4: Room Device Onboard Accessory and Port Capacity* and *Table 6: Cisco Room Accessory PoE Requirements*.

PoE-enabled switches provide a centralized, scalable solution for delivering both power and data to multiple devices. They simplify deployment by reducing cabling complexity and streamlining power management. While inline PoE injectors are a supported alternative, they

are less efficient in larger deployments due to the need for one injector per accessory and the added installation complexity.

For these reasons, Cisco advises minimizing the use of inline PoE injectors and recommends deploying PoE switches wherever possible to extend the accessory network.

Location of Room Accessories

Utilizing an external switch in place of the Room Device's onboard accessory switch enables greater flexibility in Room Accessory placement, particularly in environments where accessories are distributed across multiple locations within the room.

For example, installing a switch beneath a conference table allows for efficient and discreet connections to table-mounted microphones and controllers. In larger or more complex spaces, a switch placed in an AV equipment rack can serve as a centralized aggregation point for ceiling microphones, cameras, and other integrated devices. Another possible location could be in-ceiling enclosures, many Mechanical, Electrical, and Plumbing (MEP) firms and (Low Voltage) LV designers are designing these distributed cabling plants through the ceiling.

Alternatively, positioning a switch inside a credenza below the main display offers similar benefits to an AV rack, while also providing space for storing non-network accessories such as remotes, presentation cables, or food service items within an enclosed, professional-grade furniture piece.

Strategically locating switches at central aggregation points enhances scalability, reduces cable clutter, and facilitates easier installation and ongoing maintenance.

Access to Network Services

Cisco recommends extending the accessory network wherever feasible to provide Room Accessories with access to additional network-based services. While Cisco Webex Control Hub is fully capable of managing Room Accessories without requiring an extended network, broader network connectivity can offer significant operational advantages.

Even when onboard port and PoE capacity are sufficient, connecting Ethernet-based Room Accessories to the broader network enables IT administrators to integrate these devices into existing enterprise systems. This includes platforms for:

- Inventory management
- Security policy enforcement
- Performance monitoring
- Automation and orchestration

By incorporating Room Accessories into the wider IT ecosystem, organizations can streamline support processes, ensure consistent policy application, and improve visibility across the collaboration infrastructure.

Selecting the Right Switch Introduction

Once the decision has been made to extend the accessory network, selecting an appropriate switch becomes a critical step in the deployment process. Any Cisco-supported switch can be used to extend the accessory network.

Cisco recommends choosing a switch that not only satisfies the technical and physical requirements of the specific room deployment but also aligns with the broader objectives and architecture of the organization's network infrastructure. Considerations should include port density, PoE capabilities, management features, and compatibility with existing and future network policies and monitoring tools.

Selecting the Right Switch Considerations

Below is a list of considerations when selecting the right Cisco switch. This list is not exhaustive. Cisco strongly recommends working with a Cisco representative or partner to ensure the selected switch(es) align with the organization's current and future AV, network, security, and automation requirements.

AV & Environmental Considerations

- Fanless operation for silent environments such as conference rooms, huddle spaces, and boardrooms
- Compact form factor for non-rack installations, including credenzas, under tables, and display enclosures
- Power requirements of the switch and available power in the room or enclosure
- Thermal design and higher temperature ratings to support installation in tight or poorly ventilated spaces
- PoE power budget (per port and total) to support current and future devices such as cameras, microphones, and control panels
- Ease of cable management and physical accessibility for service and updates

Network Performance Considerations

- Link speed support (1G/2.5G/10G) on both uplink and downlink ports for current and future bandwidth needs
- Uplink options including SFP/SFP+ modules for flexible backbone connectivity

- QoS (Quality of Service) capabilities to prioritize AV traffic and ensure consistent performance

Security Considerations

- Compliance with enterprise security policies including support for 802.1X, DHCP snooping, and dynamic ARP inspection
- Secure remote management options, such as SSH, HTTPS, and SNMPv3
- Segmenting traffic with VLANs to isolate AV and control traffic from other network zones
- MAC address filtering and port security for controlling device access

Automation & Management Considerations

- Switch programmability via NETCONF, RESTCONF, Python, or other supported APIs
- Integration with Cisco Catalyst Center, Meraki Dashboard or third-party network management platforms
- Monitoring and telemetry capabilities to track performance, faults, and usage
- Support for automation frameworks to simplify deployment, updates, and troubleshooting
- Remote provisioning and plug and play (PnP) features for scalable rollouts

Enterprise Standards & Support

- Alignment with existing enterprise switch standards to maintain consistency and simplify support
- Long-term availability and support roadmap to match organizational lifecycle planning
- Warranty, software licensing, and SmartNet options for ongoing service and updates

*For complete list of Cisco campus LAN access switches, visit

<https://www.cisco.com/site/us/en/products/networking/switches/campus-lan-access/index.html>

Supported Accessory Network Topologies Introduction

An important factor in selecting a switch to extend the accessory network is understanding how it integrates into the overall network topology and what configurations are supported by Cisco.

In general, any accessory network extension is supported if it complies with established Layer 2 design best practices. The only requirement specific to Room Accessories is that they must reside within a VLAN that includes only devices communicating on the Room Device's accessory network. Additional information on this requirement is provided below in *Layer 2 Requirement Example*.

If the existing Layer 2 design adheres to Cisco best practices, Cisco recommends leveraging it to extend the accessory network. However, certain scenarios such as new construction or unique room requirements may justify implementing a different topology. These scenarios are addressed in the section *Supported Accessory Network Topologies Detail*, which provides an analysis of common access-layer designs.

*For additional guidance on Layer 2 network design and campus LAN deployments, refer to the following Cisco resources:

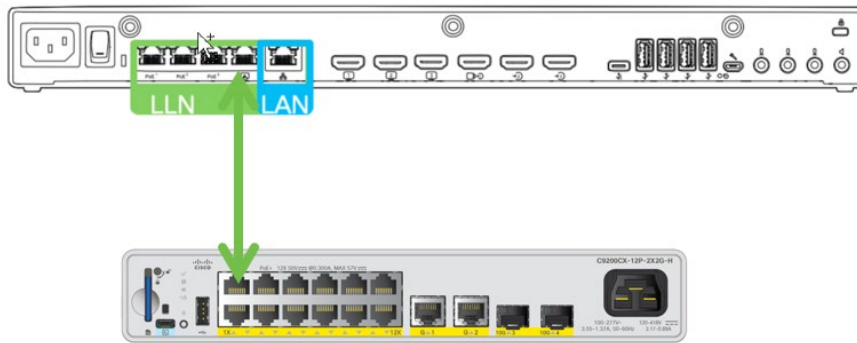
- [Cisco Campus LAN and Wireless LAN Design Guide](#)
- [Cisco Cloud-Enabled Campus LAN Design Guide](#)

Layer 2 Requirement Example

The following example illustrates the primary requirement for extending the accessory network. In this scenario, a Codec EQ is connected to a Cisco Catalyst 9200CX-12P-2X2G switch.

Since Room Devices do not support VLAN tagging or trunking, the switch port connecting to the Room Device (link-local) network must be configured as an access port. The VLAN assigned to this access port must be consistently applied to all other switch ports intended to be part of the same Room Device accessory network. This VLAN should not be extended to the rest of the switching infrastructure and should remain only on the switch dedicated to the accessories.

Figure 7: Extended the Accessory Network Example



Depending on the customer's switching strategy

This section presents two directions for extending the accessory network, depending on what is the customer switching strategy. The accompanying diagrams serve as illustrative examples and do not represent an exhaustive list of possible configurations.

For Room Devices equipped with multiple accessory ports, any port may be used to extend the accessory network or connect Room Accessories. While the Codec EQ is used as the reference device in these examples, the same topology options apply to all Room Devices.

We are going to segment the Accessories Networking topologies and solutions to two types of customer networking solutions below.

Customer has Cisco as their switching vendor

Option 1 – C9200CX switches in the room of the Room Device

Summary

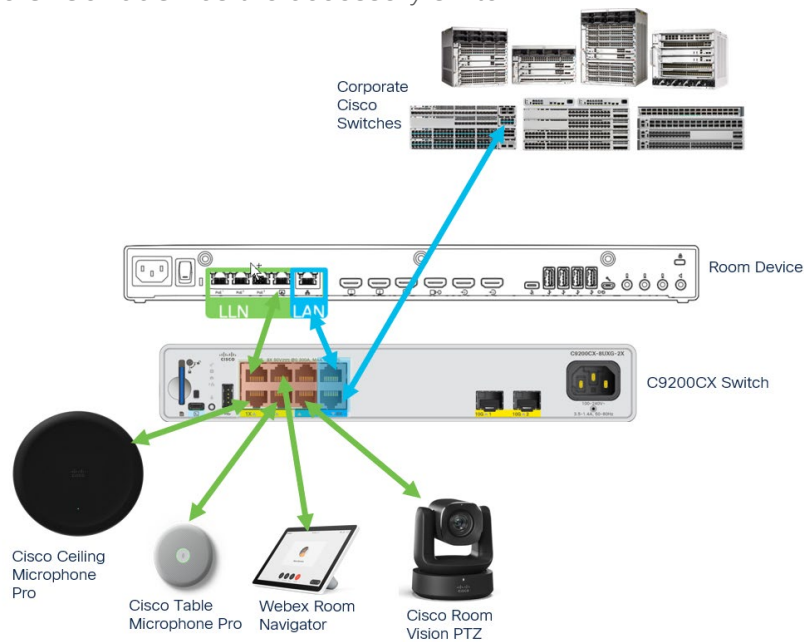
- The Room Device's LAN port connects to the existing enterprise access switch for calling and meetings.
- The Room Device's onboard accessory switch connects to a C9200CX switch that provides connectivity to some or all Room Accessories.
- The managed accessory switch is integrated with the enterprise network.

Considerations

- Recommended for IT-managed environments where network administrators require visibility, control, and remote management capabilities over the accessory network.
- Enables use of enterprise network tools for policy enforcement, traffic monitoring, switch software updates, and additional automated alerts for connected Room Accessories.

- Facilitates proactive troubleshooting, allowing remote diagnostics, PoE device reboots, and port reconfiguration without onsite intervention.
- Enhances network security by preventing unauthorized access even when the switch is physically accessible.
- Supports centralized monitoring and automation through platforms such as Cisco Catalyst Center or Meraki Dashboard, promoting scalable deployment and consistent configuration across multiple locations.

Figure 8: C9200CX as the accessory switch



Option 2 – C9000 switches in the wiring closet for the room

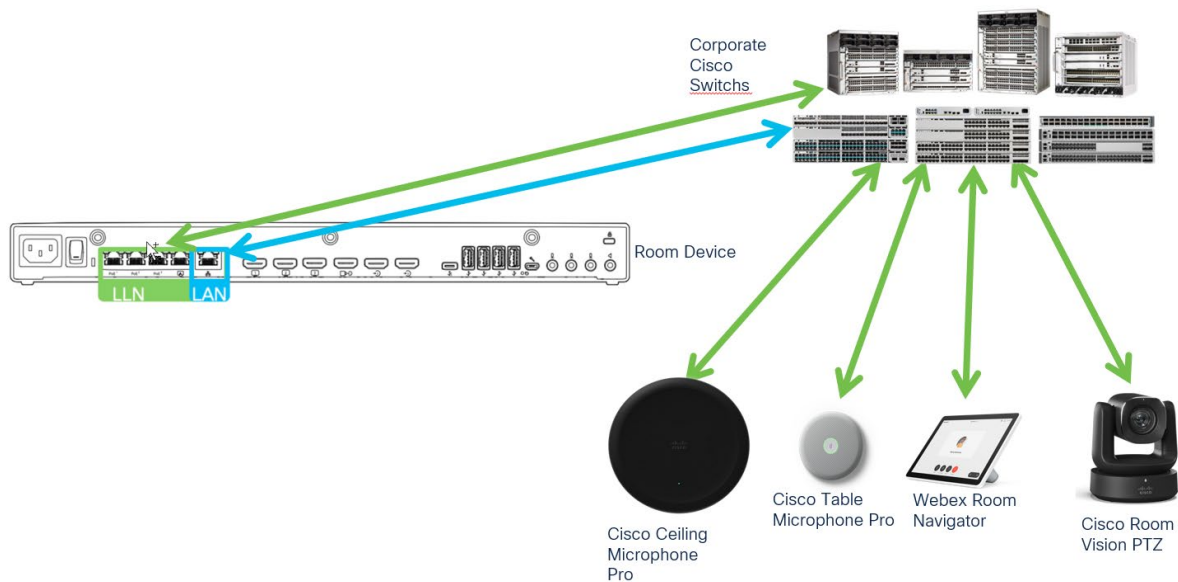
Summary

- Both the Room Device's LAN port and onboard accessory switch connect to an existing access switch located in the wiring closet.
- This setup supports calling, meetings, and some or all Room Accessories.

Considerations

- Appropriate for environments with ample network drops and existing access switch capacity, or where adding capacity is straightforward.
- Keeps network equipment out of the room, restricting physical access to network infrastructure.
- Includes all benefits described in Option 1 – C9200CX switches in the room of the Room Device.
- Requires separate VLAN per Room Device that is not pass to the rest of the customer network.

Figure 9: C9000 Switch in the Wiring Closet



Customer doesn't have Cisco as their switching vendor

Summary

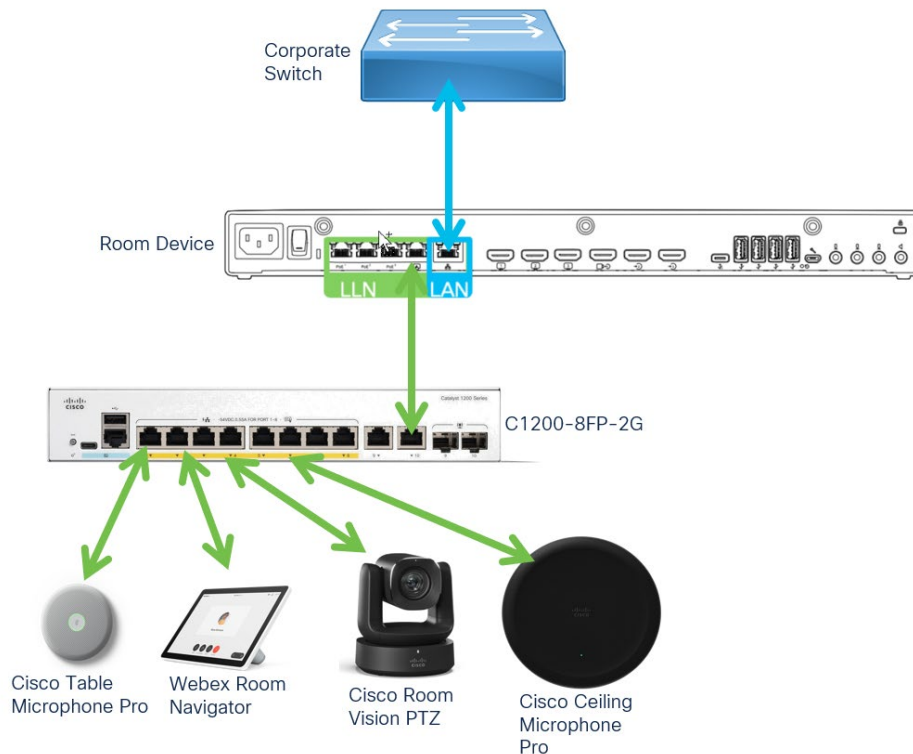
- The Room Device's LAN port connects to the existing enterprise access switch for calling and meetings.

- The Room Device's to C1200 switch that provides connectivity to some or all Room Accessories.
- This C1200 switch is isolated from the enterprise network and only connect to the Room Device.
- C1200-8FP-2G-OPT can be acquire as an extra switch when configuring the Room Device
- C1200-8FP-2G-OPT it has a total Power budget 120W for accessories.

Considerations

- Suitable for third-party managed environments where an onsite AV or service provider manages the switch locally, and the organization's IT team does not require remote access or visibility to the accessory network.
- Cisco Room Accessories remain manageable via Cisco Webex Control Hub despite the unmanaged switch lacking network management capabilities.
- Limited IT visibility and control may hinder remote diagnostics, traffic monitoring, and policy enforcement on connected devices.
- Switch is not connected to the corporate network and only has access to the Room Device Local-Link network, because of that will not create a security risk for the customer IT networking policies.
- Potential for room outages or disruptions due to inability of IT teams to detect or respond to switch failures or unauthorized changes in real time.

Figure 10: C1200-8FP-2G as the accessory switch



Room Accessory Switch Configuration

C9200CX Switches

The Cisco Catalyst 9200CX switches are compact, enterprise-class, fanless access switches within the Catalyst 9000 family. They are designed to provide high performance, scalability, and security for growing enterprise networks. These switches are based on Cisco's next-generation programmable Unified Access Data Plane (UADP) 2.0 mini ASIC and run on the open Cisco IOS XE Lite operating system, which supports model-driven programmability, robust security, and flexible visibility.

Description:

- **Form Factor and Design:** Compact and fanless, ideal for limited space environments and smart buildings.
- **Port Options:** Models offer a variety of port configurations including 1-Gbps PoE+ ports, multigigabit (mGig) ports supporting up to 60W UPOE, and 10-Gbps SFP+ uplinks.
- **Power:** Powered by a 315W internal power supply unit, with options for AC, AC/DC, and high-voltage DC (HVDC) power sources.

- **Architecture:** Built on Cisco's UADP 2.0 mini ASIC for increased bandwidth, scale, security, and telemetry.
- **Operating System:** Runs Cisco IOS XE Lite, enabling programmability, security, and advanced network visibility.
- **Security:** Supports AES-256 MACsec encryption, policy-based segmentation, and zero-trust security features.
- **Resiliency:** Features such as perpetual PoE, fast PoE, and high Mean Time Between Failures (MTBF) ensure reliable operation.
- **Uplink Flexibility:** Supports 1-Gbps and 10-Gbps uplinks with fixed uplink architecture.
- **Energy Efficiency:** Fanless design reduces noise and power consumption, suitable for noise-sensitive environments.

Characteristics of C9200CX:

- **Enterprise-Class Performance:** Delivers high throughput and scalability to meet evolving enterprise network demands.
- **Flexible Power Options:** Supports multiple power sources including AC, DC, and HVDC, enabling deployment in diverse environments and supporting sustainable energy initiatives.
- **Advanced Security:** Enhanced encryption and segmentation capabilities protect network data and support zero-trust security models.
- **IoT and Smart Building Ready:** High-density PoE and UPOE ports support a wide range of IoT devices and smart building applications.
- **Simplified Management:** Integration with Cisco DNA Center and cloud monitoring platforms enables easy deployment, management, and troubleshooting.
- **Fanless and Compact:** Ideal for space-constrained and noise-sensitive locations without compromising performance.
- **Resilient PoE:** Perpetual and fast PoE features optimize power delivery for critical devices, minimizing downtime.
- **Investment Protection:** Built on a programmable ASIC platform that supports future hardware features and software enhancements.

What features to consider delivering the best experience for AVoIP accessories

PoE Power

A PoE-capable switch port automatically supplies power to one of these connected devices if the device senses that there is no power on the circuit:

- A Cisco pre-standard powered device (such as a Cisco IP Phone)
- An IEEE 802.3af-compliant powered device
- An IEEE 802.3at-compliant powered device
- An IEEE 802.3bt-compliant powered device (certain C9200CX SKUs only)

2-Event Classification

When a class 4 device gets detected, IOS allocates 30W without any CDP or LLDP negotiation. This means that even before the link comes up the class 4 power device gets 30W. Also, on the hardware level the PSE does a 2-event classification which allows a class 4 PD to detect PSE capability of providing 30W from hardware, register itself and it can move up to PoE+ level without waiting for any CDP/LLDP packet exchange. Once 2-event is enabled on a port, you need to manually shut/un-shut the port or connect the PD again to start the IEEE detection again. Power budget allocation for a class-4 device will be 30W if 2-event classification is enabled on the port, else it will be 15.4W.

Perpetual PoE

The Perpetual POE provides uninterrupted power to connected powered device (PD) even when the power sourcing equipment (PSE) switch is booting.

Fast PoE

This feature switches on power without waiting for IOS to boot up. When poe-ha is enabled on a particular port, the switch on a recovery after power failure, provides power to the connected endpoint devices within short duration before even the IOS forwarding starts up.

QoS Auto-QoS

You can use the auto-QoS feature to simplify the deployment of QoS features. Auto-QoS determines the network design and enables QoS configurations so that the switch can prioritize different traffic flows.

The switch employs the MQC model. This means that instead of using certain global configurations, auto-QoS applied to any interface on a switch configures several global class maps and policy maps.

Auto-QoS matches traffic and assigns each matched packet to qos-groups. This allows the output policy map to put specific qos-groups into specific queues, including into the priority queue.

QoS is needed in both directions, both on inbound and outbound. When inbound, the switch port needs to trust the DSCP in the packet (done by default). When outbound, the switch port needs to give voice packets "front of line" priority. If voice is delayed too long by waiting behind other packets in the outbound queue, the end host drops the packet because it arrives outside of the receive window for that packet.

Note:

Depending on your auto-QoS configuration, use one of the following commands:

The following commands enable auto-QoS for the specified video device (system, camera, or media player):

- **auto qos video cts** –A port connected to a Cisco Telepresence system. QoS labels of incoming packets are only trusted (conditional trust through CDP) when a Cisco TelePresence is detected.
- **auto qos video ip-camera** –A port connected to a Cisco video surveillance camera. QoS labels of incoming packets are only trusted (conditional trust through CDP) when a Cisco camera is detected.
- **auto qos video media-player** –A port connected to a CDP-capable Cisco digital media player. QoS labels of incoming packets are only trusted (conditional trust through CDP) when a digital media player is detected.

Custom QoS for AVoIP accessories

Accessories are going to DSCP the different traffic with the following

DSCP: EF for PTPv2

DSCP: AF41 for Microphone Audio Data (RTP/RTCP)

DSCP: AF42 for Camera Video Data (RTP/RTCP)

DSCP: CS0 for Control Traffic (HTTP/RTSP/pairing/...)

The Cisco Catalyst 9200CX switch provides comprehensive Quality of Service (QoS) features, supporting up to eight egress queues per port to allow granular traffic management.

Of these eight queues, two can be configured as priority queues (priority level 1 and priority level 2), which are designed to handle traffic with lower latency compared to other queues. These priority queues, however, are limited to a maximum of 99.6% line rate to maintain latency below 20 microseconds and prevent oversubscription.

The remaining queues are available for bandwidth allocation, shaping, and scheduling using mechanisms such as Weighted Tail Drop (WTD) and Weighted Random Early Detection (WRED) to manage congestion and packet drops effectively.

The switch enables class-based transmit queue selection through output QoS classification, and by default, assigns control traffic to queue 0 and all other traffic to queue 1, when a queuing policy is applied, control packets are mapped to the highest threshold priority queue.

The Catalyst 9200CX also supports hierarchical QoS, allowing for layered classification, policing, and shaping policies. Scheduling can be managed through Strict Priority or Weighted Round Robin (WRR), and both methods can be used together to provide flexible traffic handling. With capabilities for both ingress and egress classification, marking, policing, and queuing, the switch ensures robust and customizable QoS for diverse network requirements.

We will recommend the following policy for QoS for the accessories in the Accessories VLAN

```
! Identifying PTP traffic
class-map match-any vPTP
match dscp ef
! Identifying audio traffic
class-map match-any Audio
match dscp af41
! Identifying Video traffic
class-map match-any Video
match dscp af42
! creating the policy for egress traffic on AVoIP Accessory ports
policy-map AVoIPAccessories
! Assigning PTP to P1 queue
class vPTP
priority level 1
! Assigning Audio to P2 queue
class Audio
priority level 2
! Assigning Video to a queue that has the remain of the traffic and with Weighted Tail
Drop (WTD) and Weighted Random Early Detection (WRED) assign 65% of the
bandwidth
class Video
bandwidth remaining percent 65
! All the rest of the traffic goes to a queue that has the remain of the traffic and with
Weighted Tail Drop (WTD) and Weighted Random Early Detection (WRED) assign 35%
of the bandwidth
class class-default
bandwidth remaining percent 35
```

Multicast IGMP

Prerequisites for IGMP Snooping

Observe these guidelines when configuring the IGMP snooping querier:

- Configure the VLAN in global configuration mode.
- Configure an IP address on the VLAN interface. When enabled, the IGMP snooping querier uses the IP address as the query source address.
- If there is no IP address configured on the VLAN interface, the IGMP snooping querier tries to use the configured global IP address for the IGMP querier. If there is no global IP address specified, the IGMP querier tries to use the VLAN device virtual interface (SVI) IP address (if one exists). If there is no SVI IP address, the device uses the first available IP address configured on the device. The first IP address available appears in the output of the show ip interface privileged EXEC command. The IGMP snooping querier does not generate an IGMP general query if it cannot find an available IP address on the device.
- The IGMP snooping querier supports IGMP Versions 1 and 2.
- When administratively enabled, the IGMP snooping querier moves to the nonquerier state if it detects the presence of a multicast router in the network.
- When it is administratively enabled, the IGMP snooping querier moves to the operationally disabled state under these conditions:
 - IGMP snooping is disabled in the VLAN.
 - PIM is enabled on the SVI of the corresponding VLAN.

More details on IGMP configuration can be found in the [configuration guide here](#).

You can configure the device as a member of a multicast group and discover multicast reachability in a network. If all the multicast-capable routers and multilayer devices that you administer are members of a multicast group, pinging that group causes all of these devices to respond. The devices respond to ICMP echo-request packets addressed to a group of which they are members. Another example is the multicast trace-route tools provided in the software.

IGMP snooping is already enabled by default in these switches

Which 9200CX Switch to choose and recommended configuration

Figure 11: C9200CX family and basic characteristics

Catalyst 9200CX Family

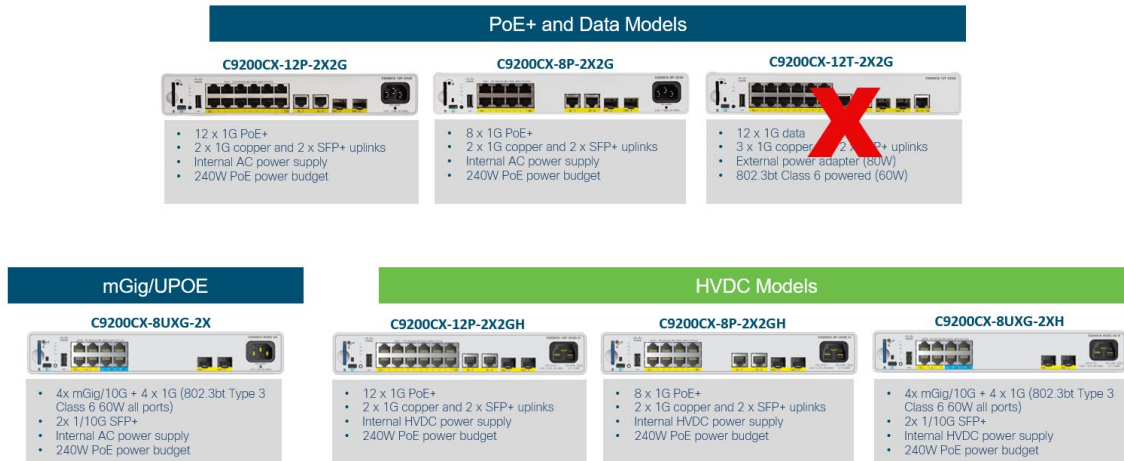


Table 7: C9200CX models

6 models that can deliver 240W in total for the PoE ports

Switch model	Downlinks total 10/100/1000 or PoE+ copper ports	Uplink configuration	Default primary power supply	Fans
C9200CX-12T-2X2G	12 ports data	2x 1G copper, 1x 1G CU PD 802.3bt Class 6, 2x 10G SFP+ fixed uplinks	Powered by 802.3bt class 6 PoE Optional auxiliary 80W AC or DC power adaptor	Fanless
C9200CX-12P-2X2G	12 ports PoE+	2x 1G copper, 2x 10G SFP+ fixed uplinks	315W AC internal	Fanless

C9200CX-8P-2X2G	8 ports full PoE+	2x 1G copper, 2x 10G SFP+ fixed uplinks	315W AC internal	Fanless
C9200CX-8UXG-2X	8 ports UPOE (4 mGig ports up to 10G, 4 ports up to 1G)	2x 10G SFP+ fixed uplinks	315W AC internal	Fanless
C9200CX-12P-2XGH	12 ports PoE+	2x 1G copper, 2x 10G SFP+ fixed uplinks	315W HVDC/AC internal	Fanless
C9200CX-8P-2XGH	8 ports full PoE+	2x 1G copper, 2x 10G SFP+ fixed uplinks	315W HVDC/AC internal	Fanless
C9200CX-8UXG-2XH	8 ports UPOE (4 mGig ports up to 10G, 4 ports up to 1G)	2x 10G SFP+ fixed uplinks	315W HVDC/AC internal	Fanless

C9200CX-12P-2X

Figure 12: C9200CX-12P-2X2G

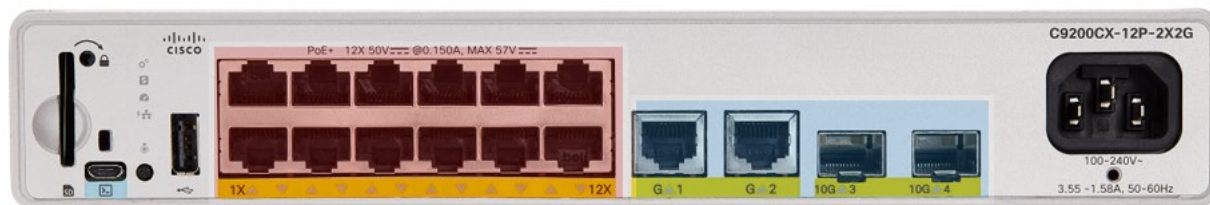
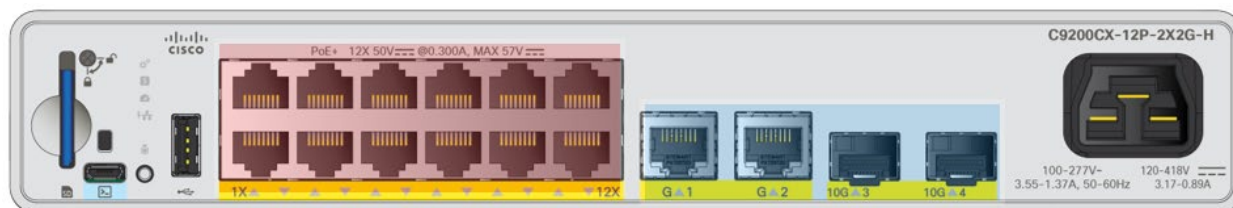


Figure 13: C9200CX-12P-2XGH



Red – Accessory Vlan

Blue – Connection to corporate switch and Codec for Voice Vlan and Management (can be deliver by RJ45 or SFP interface)

POE+ ports with a total maximum budget of 240W

C9200CX-8P-2X

Figure 14: C9200CX-8P-2X2G



Figure 15: C9200CX-8P-2XGH



Red – Accessory Vlan

Blue – Connection to corporate switch and codec for Voice Vlan and Management (can be deliver by RJ45 or SFP interface)

POE+ ports with a total maximum budget of 240W

C9200CX-8UXG-2X

Option 1 – Using SFP

Figure 16: C9200CX-8UXG-2X with SFP

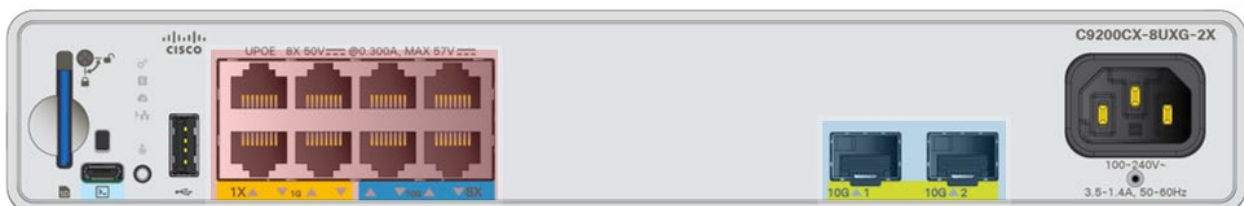


Figure 17: C9200CX-8UXG-2XH with SFP



Red – Accessory Vlan

Blue – Connection to corporate switch and codec for Voice Vlan and Management (SFP interface)

POE+ ports with a total maximum budget of 240W

Option 2 Using Ethernet Ports

Figure 18: C9200CX-8UXG-2X without SFP

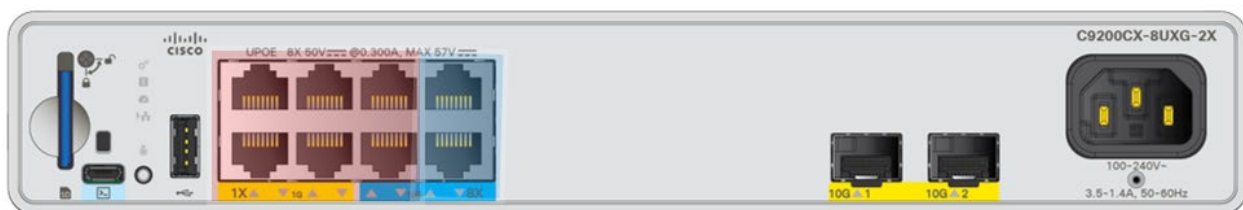
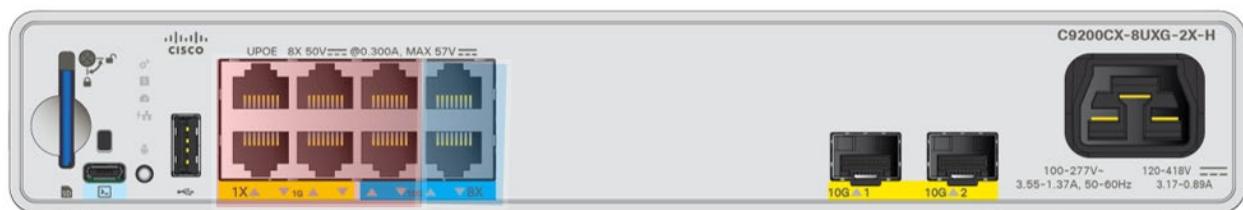


Figure 19: C9200CX-8UXG-2X without SFP



Red – Accessory Vlan

Blue – Connection to corporate switch and codec for Voice Vlan and Management (RJ45 interface)

UPOE ports with a total maximum budget of 240W

What to configure in the Switch for AVoIP accessories

! To enable LLDP for accessories

lldp run

! Making sure that the AVoIP accessories VLAN is not passed to the infrastructure

vtp mode transparent

! Class-map to identify PTP traffic

```

class-map match-any vPTP
  match dscp ef
! Class-map to identify Audio traffic
class-map match-any Audio
  match dscp af41
! Class-map to identify Video traffic
class-map match-any Video
  match dscp af42
! Policy-map to assign the traffic to the right switching queues
policy-map AVoIPAccessories
! Priority 1 queue for PTP
class vPTP
  priority level 1
! Priority 2 queue for Audio
class Audio
  priority level 2
class Video
  bandwidth remaining percent 65
class class-default
  bandwidth remaining percent 35
!
! Creating a VLAN that will be local to the switch and that will not be allowed in the outgoing trunk to the
corporate network
Vlan<AVoIP VLAN>
  Name AVoIP Accessories
!
interface GigabitEthernet1/0/1
  description Codec Link_Local interface
  switchport access vlan <AVoIP VLAN>
  service-policy output AVoIPAccessories
  spanning-tree portfast
! Depending on the model of the C9200CX switch defining the ports for accessories
interface range GigabitEthernet1/0/2 - <6-12>
  description AvolP Accessory
  switchport access vlan <AVoIP VLAN>
  power inline port perpetual-poe-ha
  power inline port poe-ha
  service-policy output AVoIPAccessories
  spanning-tree portfast
! Port defined to allow the Room Device to connect to the corporate VLAN for voice/video
traffic
interface TenGigabitEthernet1/0/<7|13>
  description Codec public interface connection to C9200CX
  switchport mode access
  switchport voice vlan <VoiceVLAN>
  auto qos video cts
  spanning-tree portfast

```

! Port that establishes the trunk between the AVoIP switch and the corporate Switching infrastructure

```
interface TenGigabitEthernet1/0/<8|14>
```

```
description C9200CX Switch connection to corporate network
```

```
switchport mode trunk
```

! Making sure that the AVoIP vlan is not pass to the distribution switch

```
switchport trunk allowed vlan except <AVoIP VLAN>
```

!

C1200 Switches

The Cisco C1200-8FP-2G switch is a rack-mountable, Layer 2 managed switch designed for small business networks. It features 8 ports of 10/100/1000 PoE+ Ethernet with a total power budget of 120W, and 2 Gigabit copper/SFP combo uplink ports. This model supports essential network features such as VLANs, Spanning Tree Protocol (STP), access control lists (ACL), quality of service (QoS), and IPv4/IPv6 static routing. It is fanless, which makes it suitable for noise-sensitive environments like meeting rooms.

Characteristics of C1200-8FP-2G:

Power over Ethernet (PoE+) Support: With 120W power budget, it can power multiple PoE devices such as IP phones, wireless access points, and video collaboration devices, simplifying deployment and reducing the need for separate power supplies.

Fanless Design: Minimizes noise, ideal for office or meeting room environments.

Performance: Provides reliable Gigabit Ethernet connectivity with combo uplink ports for flexible fiber or copper connections.

Energy Efficiency: Supports Energy-Efficient Ethernet (IEEE 802.3az) to reduce power consumption during low traffic periods.

Compatibility: Plug and play with existing voice, wireless, data, and video devices, supporting smooth integration into existing networks.

This switch should be configured as an option when buying the Room Device

Figure 16: Order C1200-8FP-2G with Room Device

Configuration Summary [View Full Summary](#)

Country/Region Specification ⓘ

Select Country/Region (Not Required) ▼

Category ⓘ	Qty	Extended List Price (USD)
microphone Options		
Ceiling Microphone Pro Options		
Extra Switch		
HW autoexpand		

[Option Search ⓘ](#)
[Multiple Options Search ⓘ](#)

CS-KIT-EQX-C-NR-K9 > Extra Switch

Extra Switch

SKU
<input type="checkbox"/> C1200-8FP-2G-OPT Catalyst 1200 8-port GE, Full PoE, 2x1G Combo More

[Show Incompatible SKUs](#)

Configuration of this switch for a Room device is available in <https://www.cisco.com/c/dam/en/us/td/docs/telepresence/endpoint/room-series/installation-guide/C1200-switch-configuration-for-collaboration-devices.pdf>

Figure 17: Configuration guide for C1200 switches



Configuration of Cisco C1200 Switches for use with Cisco Video Collaboration Devices

June 2025

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Supported Accessory Network Topologies FAQ

Q1. Can both onboard accessory switch ports and a separate accessory switch be used simultaneously?

A1. Yes. It is not an either/or decision. Room Devices support a hybrid configuration in which onboard accessory switch ports and external PoE-capable switches are used together to connect Room Accessories.

Q2. If the Room Device has multiple onboard accessory ports, can each port connect to a different switch?

A2. Yes. Multiple accessory switches can be connected to separate onboard accessory ports on the same Room Device. However, the overall accessory network must avoid Ethernet loops. Cisco recommends following Layer 2 design best practices and avoiding topologies that could introduce switching loops.

Q3. Can the accessory network be extended from one switch to another?

A3. Yes. The accessory network VLAN can be extended across multiple switches to support Room Accessories located throughout a room or facility. To maintain proper isolation and pairing functionality, ensure that the VLAN used for the Room Device's accessory network is not shared with unrelated devices or traffic outside of the Room Device and its accessories.

Q4. Are Room Accessories still plug-and-play when connected through an extended accessory network?

A4. Yes. If the Room Device and all Room Accessories are in the same VLAN (i.e., Layer 2 broadcast domain), they will automatically discover and pair over an encrypted link. No additional configuration is required on the accessories or Room Device.

Q5. Do Room Devices support VLAN tagging or trunk ports on onboard accessory switch ports?

A5. No. Room Device accessory switch ports do not support VLAN tagging or trunking. All connected ports must be configured as access ports in a single, untagged VLAN. This VLAN must remain consistent across all connected switches used to extend the accessory network.

Q6. What happens if devices outside of the Room Accessory network are placed on the same VLAN?

A6. Mixing non-accessory devices on the Room Device's accessory VLAN is not supported and may lead to pairing issues, increased broadcast traffic, or unexpected behavior. Cisco recommends isolating Room Accessories in a dedicated VLAN used exclusively for communication with the Room Device.

Q7. Are there limitations on the number or type of accessories that can be connected over an extended accessory network?

A7. Yes. Although using external switches can expand physical port and power availability, each Room Device has defined limits on the number and types of Room Accessories it can support. These limits are based on system resources, firmware capabilities, and device compatibility. For the most up-to-date information on supported accessory combinations and maximums, refer to the official Cisco Devices page:

<https://www.webex.com/us/en/devices.html>.

Q8. Can inline PoE injectors be used in topologies with extended accessory networks?

A8. Yes. Inline PoE injectors may be used where a switch port does not provide sufficient PoE to a Room Accessory. However, Cisco recommends using managed PoE-capable switches as the preferred method for power delivery due to their scalability, centralized control, and reduced deployment complexity.