



Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Aggregation Services Router Hardware Installation Guide

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CHAPTER

1

Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers Overview

The Cisco ASR 920 Series Aggregation Services Routers are a family of fixed configuration routers that enables Service Providers to provide business, residential, and mobile access services to their users. It is the Carrier Ethernet access platform providing Ethernet services.

The Cisco ASR 920 routers complement and extend Cisco's current and planned Carrier Ethernet routing portfolio providing a cost optimized, and extended temperature range access platform.

The Cisco ASR 920 routers do not have high availability features.

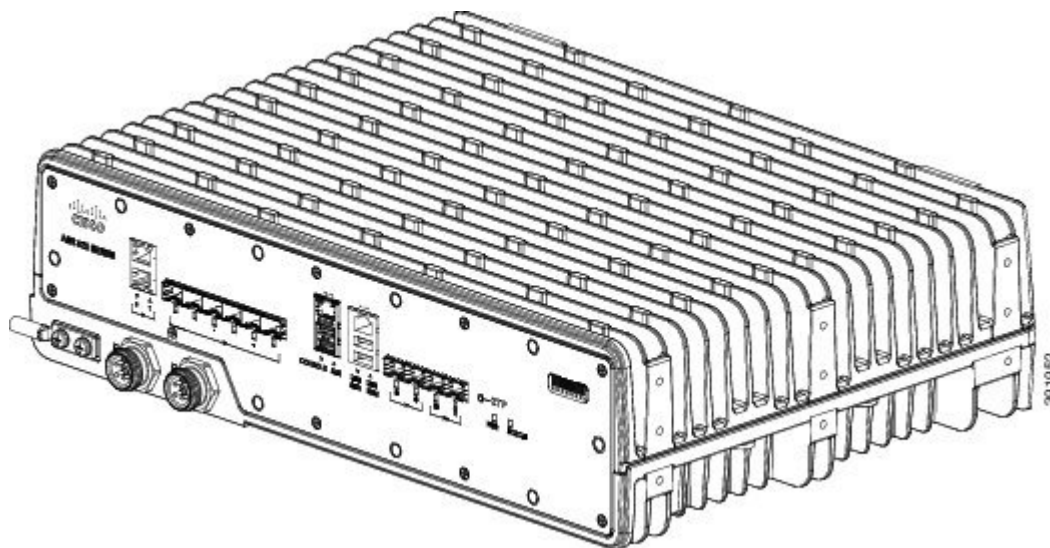
The Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD routers are designed for deployment in an environment protected from rain and direct sunlight.

- [Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers Feature, on page 1](#)

Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers Feature

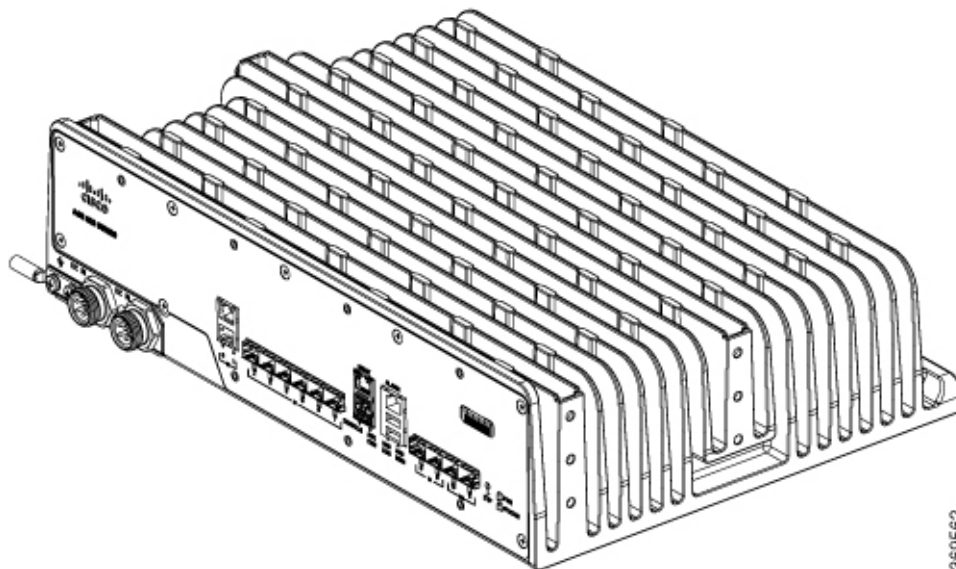
The following figure shows the Cisco ASR 920-10SZ-PD Router.

Figure 1: Cisco ASR 920-10SZ-PD Router



Effective July 2018, the Cisco ASR 920-10SZ-PD front panel and case are remodeled. All installation procedures, however, remain the same. The following figure shows the remodeled Cisco ASR 920-10SZ-PD and the Cisco ASR-920-8S4Z-PD router.

Figure 2: Cisco ASR 920-10SZ-PD Router - Remodeled and Cisco ASR-920-8S4Z-PD



The Cisco ASR 920-10SZ-PD Router has the following:

- 10x1 Gigabit Ethernet ports and 2x10 Gigabit Ethernet ports for an uplink.

1 GE Port	10 GE Port	Type of 1 GE Port	Type of 10 GE Port
10	2	10x1G (2 Copper Ports + 8x1G SFP)	Built-in 2 SFP+ (Dual Rate)

The Cisco ASR-920-8S4Z-PD Router has the following:

- 4x10 Gigabit Ethernet ports and 8x1 Gigabit Ethernet ports for an uplink.

1 GE Port	10 GE Port	Type of 1 GE Port	Type of 10 GE Port
8	4	8x1G (2 Copper Ports + 6x1G SFP)	Built-in 4 SFP+ (Dual Rate)

GigabitEthernet Copper Ports

Fixed copper GigabitEthernet (GE) interfaces are provided through standard RJ-45 connectors. These ports support the following features:

- Standard 10/100/1000Base-T/TX operation with forced or auto-negotiation for speed and duplex.
- Automatic crossover (auto-MDIX) for straight-through and crossover connections.
- Pause flow control as defined by the 802.3x standard.
- Frame size of 9216 bytes.
- Synchronous ENET operation that provides its recovered receive clock as an input clock source for the SETS as well as uses the system-wide reference clock to derive its transmit clock.

GE SFP Ports

The GE SFP ports support the following features:

- 100Base-FX and 1000Base-X SFP modules.
- Digital optical monitoring as specified by the SFP.
- Any mix of SFPs is supported unless specifically noted.
- Pause flow control as defined by the 802.3x standard.
- Frame size of 9216 bytes.
- Synchronous ENET operation that provides its recovered receive clock as an input clock source for the SETS as well as uses the system-wide reference clock to derive its transmit clock.



Note Copper SFPs do not support synchronous ENET operations.

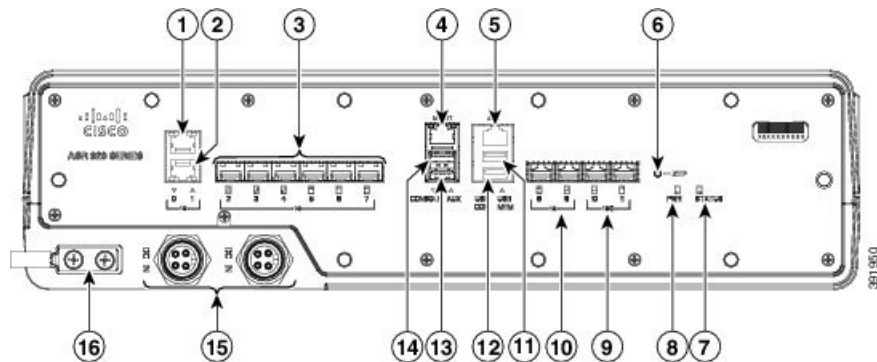
SFP+ Ports

The SFP+ ports support the following features:

- Any mix of SFPs is supported unless specifically noted.
- Pause flow control as defined by the 802.3x standard.
- Frame size of 9216 bytes.

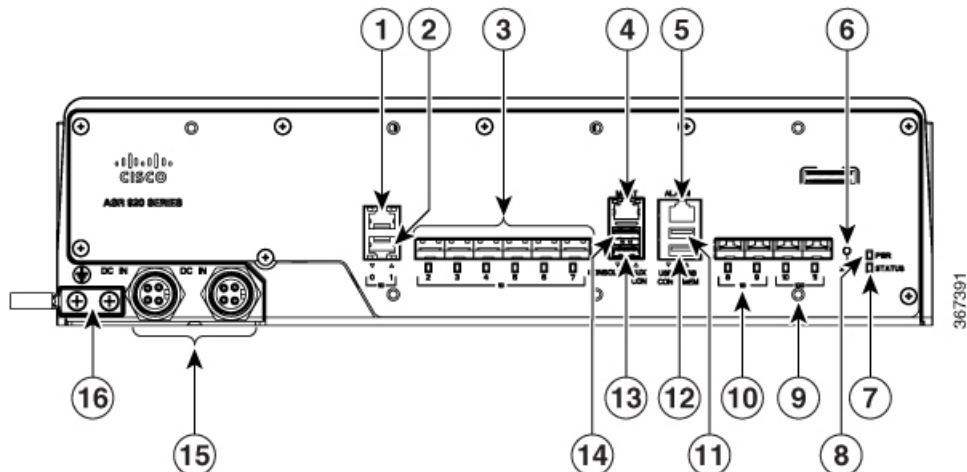
The following figures describe the front panel for the Cisco ASR 920-10SZ-PD Router.

Figure 3: Front Panel of Cisco ASR 920-10SZ-PD Router



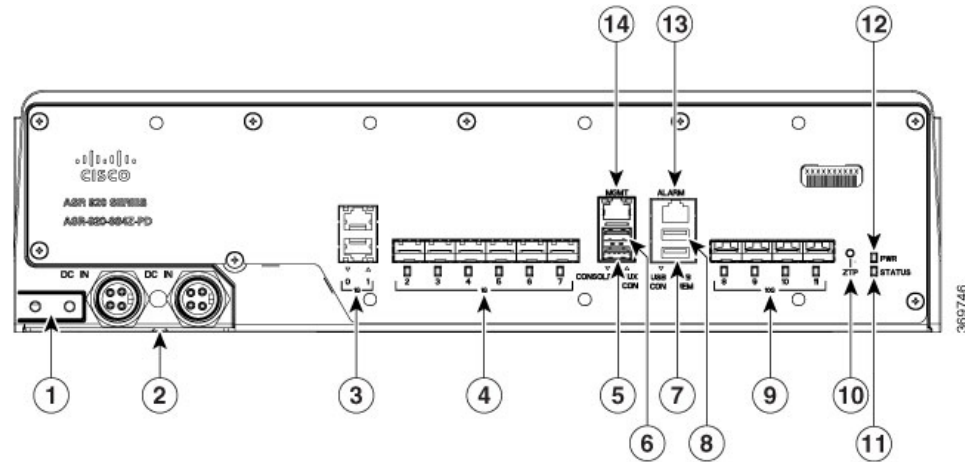
Effective July 2018, the Cisco ASR 920-10SZ-PD front panel and case are remodeled. All installation procedures, however, remain the same. The following figure shows the remodeled Cisco ASR 920-10SZ-PD and the Cisco ASR-920-8S4Z-PD router.

Figure 4: Front Panel of Cisco ASR 920-10SZ-PD Router - Remodeled



1	1 GE Copper Interface	9	2x1G/10G (Dual Rate) SFP/SFP+ ports
2	1 GE Copper Interface	10	2x1GE fiber ports
3	6x 1GE SFP ports	11	USB Memory port
4	Management port	12	USB Console port
5	Alarm input connector port	13	Console port (TIA/EIA-232F)
6	Zero Touch Provisioning (ZTP) button	14	Auxiliary console port
7	System Status LED	15	2xDC power supply input connector
8	Board power LED	16	Grounding lug

Figure 5: Front Panel of Cisco ASR-920-8S4Z-PD



1	Ground	8	USB Memory port
2	2xDC power supply input connector	9	4x10GE SFP+ ports
3	2x1GE Copper Interface	10	Zero Touch Provisioning (ZTP) button
4	6x1GE SFP ports	11	Status LED
5	Console port (TIA/EIA-232F)	12	Power LED
6	Auxiliary console port	13	Alarm input connector port
7	USB Console port	14	Management port

For more information on the router specifications, see [Cisco ASR 920 Series Aggregation Services Routers Data Sheet](#).

External Interfaces

The Cisco ASR 920 routers have these external physical interfaces on the front panel:

Network Interfaces

The network interfaces are provided through fixed ports.

- GE SFP ports—supports 100/1000 modes



Note Ports 8 and 9 do not support 100M and copper SFPs.

- GE Copper RJ-45 ports—supports 10/100/1000 operation
- Dual rate ports—supports 1G/10G mode depending on the SFP+/SFP in the network interface slot.

External Alarm Inputs

The Cisco ASR 920 router supports four dry contact alarm inputs through an RJ-45 jack on the front panel.

- Normally Open—indicates that no current flows through the alarm circuit and the alarm is generated when the current is flowing.

Management Interfaces

The Cisco ASR 920 routers have the following management interfaces:

Management ENET Port

A single management copper ENET port supporting 10/100/1000Base-T operation is provided on the front panel. It uses a standard RJ-45 jack.



Note This is not a data plane port.



Note This interface does not support Synchronous Ethernet Clocking.

TIA/EIA RS232 Console Port

The RS232 console port provides transmission (Tx), reception (Rx), and ground (Gnd).



Note The RS232 console port is enabled only through the Cisco-designed cable adapter USB type A cable to RJ-45 adapter cable. To use this port, disable the flow control on the terminal.

USB Console

A single USB 2.0 Type-A receptacle is provided on the front panel of the Cisco ASR 920 router for providing console access to ROMMON, Cisco IOS-XE and diagnostics. While it uses the Type-A connector, it operates as a USB peripheral only for connection to an external host computer. This interface requires the use of a Type-A (male) to Type-A (male) connector instead of a standard USB cable.



Note Use of the USB console is mutually exclusive of the RS232 console port. This interface requires the use of a Type-A (male) to Type-A (male) USB cable.

USB Mass Storage

A single USB 2.0 Type-A receptacle is provided on the front panel of the Cisco ASR 920 router for inserting external USB mass storage devices, such as standard USB flash drives. This interface is used to load images, load or store configurations, write logs, and so on. It supports operation up to 12Mbps.

Maximum memory supported in ROMmon is 8GB and in Cisco IOS is 16GB.

Zero Touch Provisioning (ZTP) Button

The ZTP button on the front panel initiates the ZTP process on a short press of less than eight seconds. Pressing the ZTP button for more than eight seconds causes a board reset.

For more information on ZTP, see Power and STAT LED section.

RS232 Auxiliary Console Port

The RS232 Aux console port provides transmission (Tx), reception (Rx), and ground (Gnd).



Note The RS232 Aux console port is enabled only through the Cisco-designed cable adapter from USB type A cable to RJ-45 adapter cable.



Note This is a debug-only port. It is recommended that this port be used by field service engineers only.

Power Supply

The Cisco ASR 920-10SZ-PD and ASR-920-8S4Z-PD Routers support DC power supplies in a 1+1 redundant configuration.



Note The power supply units are built-in and are not modular.

Table 1: Power Supply Specification

Specification	Value
Voltage (DC only)	24 V – 60 V
Current	4A through a four-position connector
Input Power	80 W



Note If a surge of more than 500 V is expected, add an appropriate external surge protective device.



Caution In case of power supply failure, it is highly recommended to let a Cisco technician replace the router.

LED Indicators

This section describes the different types of LEDs and their behavior.

PWR and STAT LEDs

The PWR and STAT LEDs are available on the front panel. These LEDs provide power on the board (PWR) and overall router health (STAT) status. During power up state, these LEDs provide booting status and report errors.



Note The digital code signing functionality validates the integrity and authenticity of the ROMMON image before booting it.

Table 2: PWR and STAT LED Indications

PWR LED State	STAT LED state	Indication	Comment
Amber	Off	Power in the system is all right and FPGA configuration is taking place.	Permanent Amber/Off indicates FPGA configuration failure.
Amber	Red	FPGA Image Validation Error.	System is in unresponsive state.
Flashing Amber and Green alternatively	Amber	Upgrade FPGA image error, continuing with Golden FPGA image.	—
Flashing Amber and Green alternatively	Off	FPGA configuration successful and Digital code signing successfully validated FPGA image. Digital code signing passed the control to Microloader to boot ROMMON.	—
Flashing Amber and Green alternatively	Red	Digital code signing reported failure in ROMMON image validation.	—
Green	Flashing Amber	ZTP process has begun. Note A short press of the ZTP button triggers the provisioning. A longer press of more than eight seconds, resets the board.	Both LEDs turn Green once provisioning is complete.
Green	Off	IOS-XE image is booting.	—
Green	Green	Successfully booted and system is operating normally.	—
Green	Amber	A minor alarm or synchronization is in Holdover or free-running mode	—
Green	Red	A major or critical alarm (high temperature reported for any sensor).	—

CPU Management Port LEDs

The LED for the 10/100/1000 Management port is integrated on the connector itself. There are two LEDs in the connector—the LED on the left indicates the Link/Activity status and the LED on the right is non-functional.



Note The CPU management port LED on the right is non-functional and hence doesn't indicate any port status.

Table 3: CPU Management Port LED Indication

LED	LED State	Indication
Left	Green	Link up in 1000 Mbps
	Blinking Green	Activity in 1000 Mbps
	Amber	Link up in 100 Mbps
	Blinking Amber	Activity in 100 Mbps
	Orange	Link up in 10 Mbps
	Blinking Orange	Activity in 10 Mbps
	Off	Link down

SFP LEDs

Each SFP port has an LED indicator.

Table 4: SFP Port LED Indication

LED	LED State	Indication
Labeled same as the SFP port number	Green	Link up in 1000Base-X/100Base-FX
	Blinking Green	Activity in 1000 Base-X/100Base-FX
	Yellow	Link down/Fault/Error
	Off	Administratively down

SFP+ LEDs

Each SFP+ port has an LED indicator.

Table 5: SFP+ Port LED Indication

LED	LED State	Indication
Labeled same as the SFP port number	Green	Link up in 10G/1G
	Blinking Green	Activity in 10G/1G
	Yellow	Link down/Fault/Error
	Off	Administratively down

RJ-45 LEDs

Each RJ-45 port has two LED indicators. Left LED indicates the Link status; right LED indicates the status of the duplex LED.

Table 6: RJ-45 LED Indication

LED	LED State	Indication
Left	Green	Link up in 10/100/1000 Mbps
	Blinking Green	Activity in 10/100/1000 Mbps
	Yellow	Link down/Fault/Error
	Off	Administratively down
Right	Green	Link up in full duplex
	Off	Link up in half duplex

System–Interface LED Behavior

Table 7: 1G Copper and 1G SFP LED Indication

Event	1G Copper Port LEDs (Link/Duplex)	1G SFP Port LEDs
ROMMON	Off/Off	Off
IOS Shut	Off/Off	Off
IOS No shut (cable disconnect)	Yellow/Off	Yellow
IOS No shut (cable connect) (media-type RJ-45)	Green/Green	Off
IOS No shut (cable connect) (media-type SFP)	Off/Off	Green
IOS No shut (cable connect) (media-type auto)	Off/Off	Green

Table 8: Dual Rate and Management Port LED Indication

Event	Dual Rate (1G/10G) Port LEDs	Management Port LEDs (Link/Duplex)
ROMMON (cable connect)	Off	Green/Green (1000 Mbps, Full Duplex) Amber/Green (100 Mbps, Full Duplex) Orange/Green (10 Mbps, Full Duplex)
ROMMON (cable connect)	Off	Off/Off
IOS Shut	Off	Off/Off
IOS No shut (cable disconnect)	Yellow	Off/Off
IOS No shut (cable connect)	Green	Green/Green in 1G mode Amber/Green in 100M mode Orange/Green in 10M mode

Online Insertion and Removal

The Cisco ASR 920 router supports the following OIR operations:

- When an SFP/SFP+ is removed, there is no effect on traffic flowing on other ports.
- When an SFP/SFP+ is installed, the system initializes that port for operation in 1G/10G based on the license.
- Power supplies are redundant and non-modular. When both power supplies are active, they may or may not share the load equally. When a power supply is not working or the input cable is removed, the other power supply takes the entire load without disruption. If the power supply needs repair, the whole system must be replaced.

Licensing the Cisco ASR 920 Router

The Cisco ASR 920 Series Routers support the following types of licenses:

- Port Licensing—Port Upgrade license is available as a "Pay as you Grow" model.
 - 1G upgrade license
 - 10G upgrade license
- Bulk licensing—Bulk port licensing allows you to enable all the ports with a single license.
- Timing license (1588)—Timing license is required if the router is used as a master clock.
- Advanced Metro IP Access
- Metro IP Access
- Metro Access (default)

The following methods are used to activate the above licenses:

- Cisco Software Licensing—The Cisco Software License Activation feature is a set of processes and components to activate Cisco software feature sets by obtaining and validating fee-based Cisco software licenses.



Note Licenses generated by the Cisco Software Licensing are tied to the UDI of the chassis and a corresponding watchtower device certificate (WDC) is stored in the system.

- Cisco Smart Licensing—Smart Licensing is usage-based licensing where devices register with the Cisco Secure server.



CHAPTER 2

Preparing for Installation

This chapter describes how to prepare for the installation of the Cisco ASR 920 Series Aggregation Services Router at your site, and contains the following sections:

- [Safety Guidelines, on page 13](#)
- [Site Planning, on page 18](#)

Safety Guidelines

Before you begin the installation of the Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers, review the safety guidelines in this chapter to avoid injuring yourself or damaging the equipment.

In addition, before replacing, configuring, or maintaining the Cisco ASR 920 Series Aggregation Services Router, review the safety warnings listed in the *Regulatory Compliance and Safety Information for the Cisco ASR 920 Series Aggregation Services Router* document.

The following sections describe the safety guidelines of the router:

Standard Warning Statements

To see translations of the warnings that appear in this publication, see the *Regulatory Compliance and Safety Information for the Cisco ASR 920 Series Aggregation Services Router* document.



Warning

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety: This unit should be mounted at the bottom of the rack if it is the only unit in the rack. When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack. If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006.



Warning

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017.



Warning Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040.



Warning To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 149°F (65°C). Statement 1047.



Warning The chassis should be mounted on a rack hat is permanently affixed to the building. Statement 1049.



Warning IMPORTANT SAFETY INSTRUCTIONS: This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071.



Warning This is a Class A Device and is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this type was sold or purchased by mistake, it should be replaced with a residential-use type. Statement 294.



Warning This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. Statement 340.



Warning This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. Statement 287.

Safety Guidelines for Personal Safety and Equipment Protection

The following guidelines help ensure your safety and protect the equipment. This list does not include all the potentially hazardous situations. Therefore, you should be on alert.

- Before moving the system, always disconnect all the power cords and interface cables.
- Never assume that power is disconnected from a circuit; always check.
- Before and after installation, keep the chassis area clear and dust free.
- Keep tools and assembly components away from walk areas where you or others could trip over them.
- Do not work alone if potentially hazardous conditions exist.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

- Do not wear loose clothing that may get caught in the chassis.
- When working under conditions that may be hazardous to your eyes, wear safety glasses.

Safety Precautions for Module Installation and Removal

Be sure to observe the following safety precautions when you work on the router.

To see the translations of the warnings that appear in this publication, see the Regulatory Compliance and Safety Information for the Cisco ASR 920 Series Aggregation Services Router document.



Warning Class 1 laser product. Statement 1008



Warning Do not stare into the beam or view it directly with optical instruments. Statement 1011



Warning Invisible laser radiation present. Statement 1016



Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

Safety with Electricity



Warning This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use. Statement 39



Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43



Warning An exposed wire lead from a DC-input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC-input power source wire extends from the connector(s) or terminal block(s). Statement 122



Warning Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001



Warning Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003



Warning Read the installation instructions before connecting the system to the power source. Statement 1004



Warning This product relies on the building's installation for short-circuit (overcurrent) protection. For a DC installation, ensure that the branch circuit breaker is rated a maximum 15A for DC systems. For AC systems, 15A for voltages greater than 200Vac; 20A for voltages below 127Vac. Statement 1005



Warning This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017



Warning Take care when connecting units to the supply circuit so that wiring is not overloaded. Statement 1018



Warning The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019



Warning To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ45 connectors. Use caution when connecting cables. Statement 1021



Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022



Warning To reduce the risk of fire, use only 26 AWG or larger telecommunication line cord. Statement 1023



Warning This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024



Warning Use copper conductors only. Statement 1025



Warning This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028



Warning Connect the unit only to DC power source that complies with the safety extra-low voltage (SELV) requirements in IEC 60950 based safety standards. Statement 1033



Warning Do not use this product near water; for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool. Statement 1035



Warning This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open, or both. Statement 1043



Warning When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046



Warning Installation of the equipment must comply with local and national electrical codes. Statement 1074

When working on equipment powered by electricity, follow these guidelines:

- Locate the room's emergency power-off switch. If an electrical accident occurs, you will be able to quickly turn off the power.
- Before starting work on the system, turn off the DC main circuit breaker and disconnect the power terminal block cable.
- Before doing the following, disconnect all power:
 - Working on or near power supplies
 - Installing or removing a router chassis or network processor module
 - Performing most hardware upgrades
- Never install equipment that appears damaged.

- Carefully examine your work area for possible hazards, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- Never assume that power is disconnected from a circuit; always check.
- Never perform any action that creates a potential hazard to people or makes the equipment unsafe.
- If an electrical accident occurs, proceed as follows:
 - Use caution, and do not become a victim yourself.
 - Turn off power to the router.
 - If possible, send another person to get medical aid. Otherwise, determine the condition of the victim, and then call for help.
 - Determine whether the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Power Supply Considerations

Check the power at your site to ensure that you are receiving clean power (free of spikes and noise). Install a power conditioner, if necessary.

Preventing ESD Damage



Warning This equipment needs to be grounded. Use a green and yellow 6 AWG ground wire to connect the host to earth ground during normal use. Statement 383

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD may occur when electronic printed circuit cards are improperly handled and can cause complete or intermittent failures. When removing and replacing modules, always follow ESD prevention procedures:

- Ensure that the router chassis is electrically connected to earth ground.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. To channel unwanted ESD voltages safely to ground, connect the clip to an unpainted surface of the chassis frame. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively.
- If no wrist strap is available, ground yourself by touching a metal part of the chassis.
- Handle components by their handles or edges only.



Note For the safety of your equipment, periodically check the resistance value of the antistatic wrist strap. It should be between 1 and 10 Mohm.

Site Planning

The following sections describe how to plan for the installation of the router:

General Precautions

Observe the following general precautions when using and working with your router:

- Keep your system components away from radiators and heat sources, and do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment.
- Do not push any objects into the openings of your system components. Doing so can cause fire or electric shock by shorting out interior components.
- Position system cables and power supply cable carefully. Route system cables, the power supply cable, and plug so that they are not stepped on or tripped over. Be sure that nothing else rests on your system component cables or power cable.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications. Always follow your local and national wiring rules.
- If you turn off your system, wait at least 30 seconds before turning it on again to avoid damage to the system components.

Site Planning Checklist

Use the following checklist to perform and account for all the site planning tasks described in this chapter:

- The site meets the environmental requirements.
- The site's air conditioning system can compensate for the heat dissipation of the router.
- The floor space that the router occupies can support the weight of the system.
- Electrical service to the site complies with the requirements.
- The electrical circuit servicing the router complies with the requirements.
- Consideration has been given to the console port wiring and limitations of the cabling involved, according to TIA/EIA-232F.
- The router Ethernet cabling distances are within the prescribed limitations.
- The equipment rack in which you plan to install the router complies with prescribed requirements.
- The following factors have been carefully considered when selecting the location of the rack: safety, ease of maintenance, and proper airflow.

Site Selection Guidelines

The router requires specific environmental operating conditions. Temperature, humidity, altitude, and vibration can affect the performance and reliability of the router. The following sections provide specific information to help you plan for the proper operating environment.

The router is designed to meet the industry EMC, safety, and environmental standards described in the *Regulatory Compliance and Safety Information for the Cisco ASR 920 Series Aggregation Services Router* document.

Environmental Requirements

Environmental monitoring of the router protects the system and components from damage that is caused by excessive voltage and temperature conditions. To ensure normal operation and avoid unnecessary maintenance,

plan and prepare your site configuration *before* installation. After installation, make sure that the site maintains the environmental characteristics that are described in [Table 1](#).

For an outside plant installation (cell site cabinet, hut, and so on), install the router in a cabinet that protects the product against rain and direct sunlight. The airborne contaminants such as, dust, moisture, insects, pests, corrosive gases, polluted air, or other reactive elements present in the outside air should be within the GR3108 class 3 outdoor levels. Maintain a temperature within -40°C to 65°C (-40 to 149°F).



Note Not all metallic connections are applicable for outside plant connections.

The equipment is designed to meet the following requirements:

- GR-63-CORE, Issue 4
- GR-1089-CORE, Issue 6
- GR-3108-CORE, Class 3

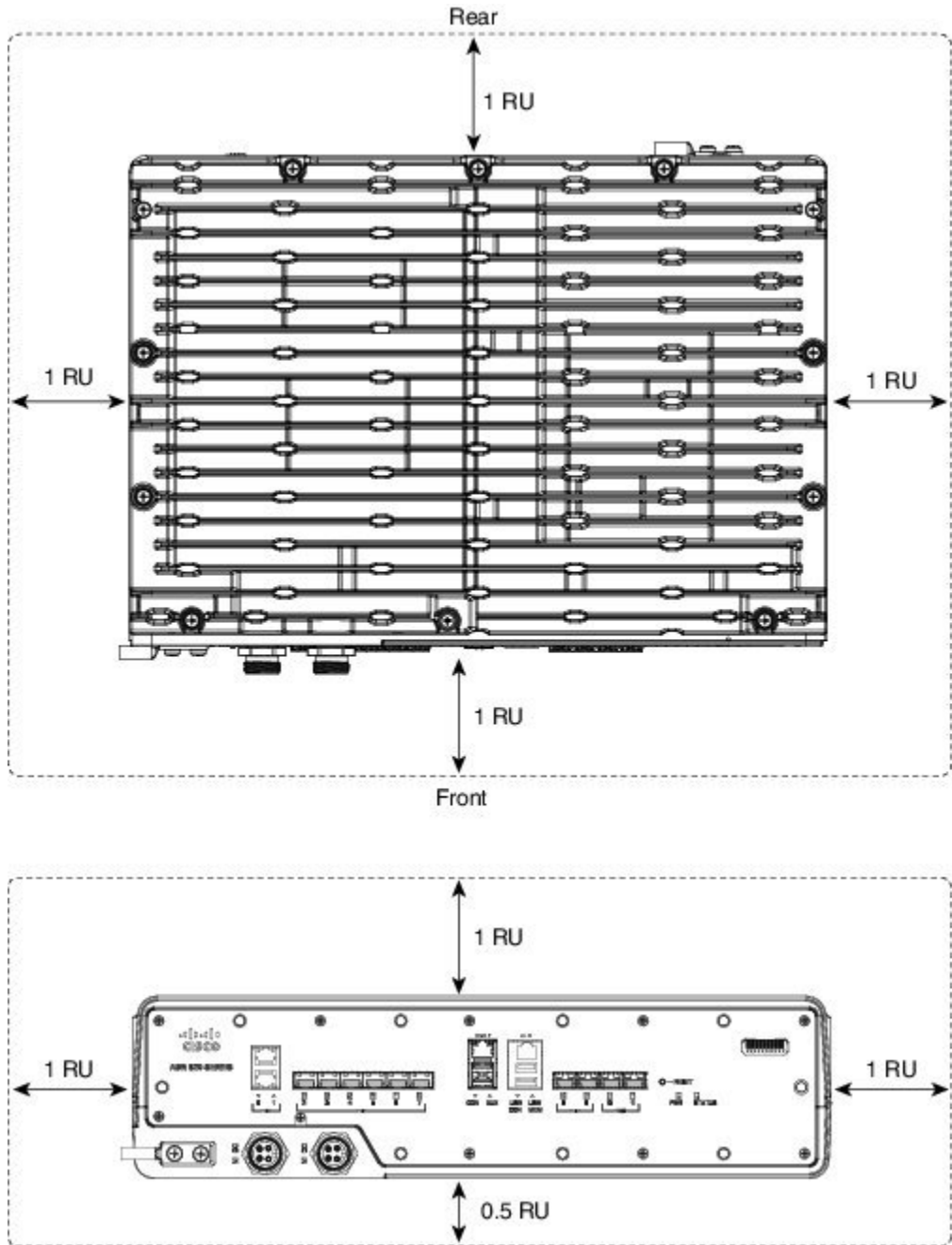
Physical Characteristics

Be familiar with the physical characteristics of the router to assist you in placing the system in the proper location. For more information, see [Table 1](#).

Clearance Guidelines

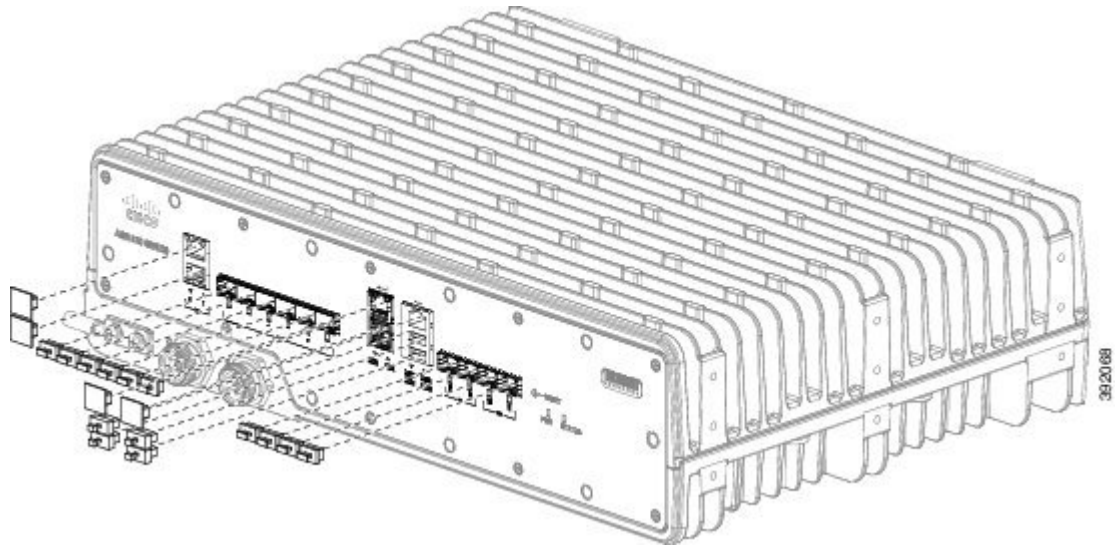
The router is a passive-cooled equipment with no fans.

Figure 6: Clearance Guidelines



- To ensure thermal performance of the product in a horizontal mounting orientation, an airflow of 1 m/s must be maintained around the product as shown in above figure.
- In the vertical mounting orientation, 60% rack space must be open at top of the product, while sides must be free from any airflow obstructions.
- If any port (RJ-45, SFP, or USB) is not used, it is recommended that such ports be covered by using the dust caps that came with the product.

Figure 7: Dust Caps



Note Dust caps are shipped with the router. However, you can also order them separately as spare parts.

A900-DCAP-RJ45-L=

A900-DCAP-RJ45-S=

A900-DCAP-SFP-L=

A900-DCAP-SFP-S=

A900-DCAP-USB-L=

A900-DCAP-USB-S=

Floor Loading Considerations

Ensure that the floor under the rack supporting the routers is capable of supporting the combined weight of the rack and all the other installed equipment.

To assess the weight of a fully configured routers, see the [Table 1](#).

For additional information about floor loading requirements, see the GR-63-CORE, Network Equipment Building System (NEBS) Requirements: Physical Protection document (www.telecom-info.telcordia.com).

Site Power Guidelines

The router has specific power and electrical wiring requirements. Adhering to these requirements ensures reliable operation of the system. Follow these precautions and recommendations when planning your site power for the router:

- The redundant power option provides a second, identical power supply to ensure that power to the chassis continues uninterrupted if one power supply fails or input power on one line fails.

- Connect each of the two power supplies to a separate input power source. If you fail to do this, your system might be susceptible to total power failure due to a fault in the external wiring or a tripped circuit breaker.
- To prevent a loss of input power, be sure that the total maximum load on each circuit supplying the power supplies is within the current ratings of the wiring and the breakers.
- Check the power at your site before installation, and periodically after installation to ensure that you are receiving clean power. Install a power conditioner, if necessary.
- Provide proper grounding to avoid personal injury and damage to the equipment due to lightning striking power lines or due to power surges. The chassis ground must be attached to a central office or other interior ground system.

**Caution**

This product requires short-circuit (overcurrent) protection to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.

**Note**

The Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers installation must comply with all the applicable codes, and is approved for use with copper conductors only. The ground bond-fastening hardware should be of compatible material and preclude loosening, deterioration, and electrochemical corrosion of hardware and joined material. Attachment of the chassis ground to a central office or other interior ground system must be made with a 6-AWG gauge wire copper ground conductor at a minimum.

For information on power specifications, see [Power Supply](#).

Electrical Circuit Requirements

Each router requires a dedicated electrical circuit. If you equip the router with dual-power feeds, provide a separate circuit for each power supply to avoid compromising the power redundancy feature.

The routers can be powered by a DC source. Ensure that equipment grounding is present and observe the power-strip ratings. Make sure that the total ampere rating of all the products plugged into the power strip does not exceed 80% of the rating.

Statement 1252—Equipment Grounding

**Warning****Statement 1252—Equipment Grounding**

This equipment must be grounded. To reduce the risk of electric shock, the power cord, plug, or combination must be connected to a properly grounded electrode, outlet, or terminal.

Site Cabling Guidelines

This section contains guidelines for wiring and cabling at your site. When preparing your site for network connections to the router, consider the type of cable required for each component, and the cable limitations. Consider the distance limitations for signaling, ElectroMagnetic Interference (EMI), and connector compatibility. Possible cable types are fiber, thick or thin coaxial, foil twisted-pair, or unshielded twisted-pair cabling.

Also consider any additional interface equipment you need, such as transceivers, hubs, switches, modems, Channel Service Units (CSU), or Data Service Units (DSU).

Before you install the router, have all the additional external equipment and cables on hand. For information about ordering, contact a Cisco customer service representative.

The extent of your network and the distances between the network interface connections depend, in part, on the following factors:

- Signal type
- Signal speed
- Transmission medium

The distance and rate limits referenced in the following sections are the IEEE-recommended maximum speeds and distances for signaling purposes. Use this information as a guideline when planning your network connections *prior to* installing the router.

If wires exceed the recommended distances, or if wires pass between buildings, give special consideration to the effect of a lightning strike in your vicinity. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic devices. If you have had problems of this sort in the past, you may want to consult experts in electrical surge suppression and shielding.

Asynchronous Terminal Connections

The router provides a console port to connect a terminal or computer for local console access. The router supports RS-232 asynchronous data with distance recommendations specified in the IEEE RS-232 standard.

Interference Considerations

When wires are run for any significant distance, there is a risk that stray signals will be induced on the wires as interference. If interference signals are strong, they may cause data errors or damage to the equipment.

The following sections describe the sources of interference and how to minimize their effects on the router system.

Electromagnetic Interference

All the equipment powered by AC current can propagate electrical energy that can cause EMI and possibly affect the operation of other equipment. The typical sources of EMI are equipment power cords and power service cables from electric utility companies.

Strong EMI can destroy the signal drivers and receivers in the router and even create an electrical hazard by causing power surges through the power lines into installed equipment. These problems are rare, but could be catastrophic.

To resolve these problems, you need specialized knowledge and equipment that could consume substantial time and money. However, you can ensure that you have a properly grounded and shielded electrical environment, paying special attention to the need for electrical surge suppression.

For information about the electrode magnetic compliance standards supported on the Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers, see the *Regulatory Compliance and Safety Information for the Cisco ASR 920 Series Aggregation Services Router* document.

Radio Frequency Interference

When electromagnetic fields act over a long distance, Radio Frequency Interference (RFI) may be propagated. Building wiring can often act as an antenna, receiving the RFI signals and creating more EMI on the wiring.

If you use twisted-pair cable in your plant wiring with a good distribution of grounding conductors, the plant wiring is unlikely to emit radio interference. If you exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal.

Lightning and AC Power Fault Interference

If signal wires exceed the recommended cabling distances, or if signal wires pass between buildings, you should consider the effect that a lightning strike in your vicinity might have on the router.

The Electromagnetic Pulse (EMP) generated by lightning or other high-energy phenomena can couple enough energy into unshielded conductors to damage or destroy electronic equipment. If you have previously experienced such problems, you should consult with RFI and EMI experts to ensure that you have adequate electrical surge suppression and shielding of signal cables in your router operating environment.

Rack-Mounting Guidelines

The following sections provide guidelines for rack-mounting the router:

Precautions for Rack-Mounting

The following rack-mount guidelines are provided to ensure your safety:

- Ensure that the rack is level and stable before extending a component from the rack.
- Ensure that proper airflow is provided to the components in the rack.
- Do not step on or stand on any component or system when servicing other systems or components in a rack.
- When mounting the router in a partially filled rack, load the rack from the bottom to the top, with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Rack Selection Guidelines

The router can be mounted in most two-post or four-post, 19-inch equipment racks that comply with the Electronic Industries Association (EIA) standard for equipment racks (EIA-310-D19-inch). The rack must have at least two posts with mounting flanges to mount the chassis.



Caution When mounting a chassis in any type of rack equipment, ensure that the inlet air to the chassis does not exceed 65° C.

The distance between the center lines of the mounting holes on the two mounting posts must be 18.31 inch \pm 0.06 inch (46.50 cm \pm 0.15 cm). The rack-mounting hardware included with the chassis is suitable for most 19-inch equipment racks.

Consider installing the router in a rack with the following features:

- NEBS-compliant, 19-inch wide (48.3-cm) rack.

- EIA hole patterns in the mounting rails. The required mounting hardware is shipped with the router.
- Leveling feet for stability.



Caution If you use an enclosed rack, ensure that the air flow requirements are maintained as discussed in *Clearance Guidelines*.

Equipment Rack Guidelines

The placement of a rack can affect personnel safety, system maintenance, and the system's ability to operate within the environmental characteristics. Choose a proper location for the router by following the guidelines described here.

Locating for Safety

If the router is the heaviest or the only piece of equipment in the rack, consider installing it at or near the bottom to ensure that the rack's center of gravity is as low as possible.

For additional information about the proper placement of electronic equipment, consult the GR-63-CORE, Network Equipment Building System (NEBS) Requirements: Physical Protection document (www.telecom-info.telcordia.com).

Locating for Easy Maintenance

Avoid installing the router in a congested rack and consider how routing of cables from other pieces of equipment in the same rack could affect access to the router.

The front and rear of the chassis must remain unobstructed to ensure adequate airflow and prevent overheating inside the chassis.

To avoid problems during installation and ongoing operations, follow these general precautions when you plan equipment locations and connections:

- Use the **show environment all** command regularly to check the internal system status. The environmental monitor continually checks the interior chassis environment; it provides warnings about high temperature and creates reports on other potentially dangerous occurrences. If warning messages are displayed, take immediate action to identify the cause, and correct the problem.
- Keep the router off the floor and out of areas that collect dust.
- Follow ESD-prevention procedures to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.

Installation Checklist

To assist you with your installation and to provide a record of what was done by whom and when, photocopy the Router Installation Checklist shown in below table. Use this to record the completion and verification of each procedure. After the checklist is completed, place it in your Site Log along with the other records pertaining to your new Cisco router.

Table 9: Cisco Router Installation Checklist

Task	Verified By	Date
Date on which chassis received		

Task	Verified By	Date
Chassis and all accessories unpacked		
Types and numbers of interfaces verified		
Safety recommendations and guidelines reviewed		
Installation Checklist copied		
Site Log established and background information entered		
Site power voltages verified		
Site environmental specifications verified		
Required passwords, IP addresses, device names, and so on, available		
Required tools available		
Network connection equipment available		
Cable guides installed (optional, but recommended)		
DC power cables connected to DC sources and router		
Network interface cables and devices connected		
System power turned on		
System boot complete (STATUS LED is on)		
Correct software configuration displayed after system banner appears		

Creating a Site Log

The Site Log provides a record of all the actions related to installing and maintaining the router. Keep it in an accessible place near the chassis so that anyone who performs tasks has access to it.

Create the Site Log prior to the installation. (See *Site Log* for more information about the Site Log as well as a sample Site Log that can be used to make copies.)

Chassis-Lifting Guidelines

The chassis is not intended to be moved frequently. Before you install the system, ensure that your site is properly prepared so that you can avoid having to move the chassis later to accommodate power sources and network connections.

Each time you lift the chassis or any heavy object, follow these guidelines:

- Ensure that your footing is solid, and balance the weight of the chassis between your feet.
- Lift the chassis slowly; never move suddenly or twist your body as you lift.

- Keep your back straight and lift with your legs, not your back. If you must bend down to lift the chassis, bend at the knees, not at the waist, to reduce the strain on your back muscles.
- Do not remove installed components from the chassis.
- Always disconnect all external cables before lifting or moving the chassis.



Caution Lift the unit only by using handles that are an integral part of the chassis, or by grasping the chassis underneath its lower edge.

Tools and Equipment

You need the following tools and equipment to install and upgrade the router and its components:

- ESD-preventive cord and wrist strap
- Antistatic mat or antistatic foam
- Number 1 and Number 2 Phillips-head screwdrivers
- #12-24 pan-head screws to secure the router to the equipment rack
- Cables for connecting to the network ports (depending on the configuration)

For more information about cable specifications, see the *Troubleshooting* section.

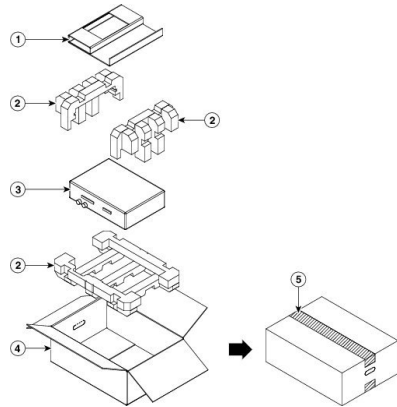
- Ethernet hub, switch, or PC with a network interface card for connecting to the Ethernet ports
- Console terminal (an ASCII terminal or a PC running terminal emulation software) that is configured for 9600 baud, 8 data bits, no parity, no flow control, and 1 stop bit
- Console cable for connecting to the console port
- Ratcheting torque screwdriver with a Phillips head that exerts up to 30-pound force per square inch (in-lb) or 0.02-kilograms force per square millimeter (kgf/mm²) of pressure
- Crimping tool as specified by the ground lug manufacturer
- Wire-stripping tools for stripping both 6-AWG and 14-AWG wires
- Tape measure and level



Warning Only trained and qualified personnel should be allowed to install or replace this equipment. Statement 49

Unpacking and Verifying the Shipped Contents

Figure 8: Shipping Contents of the Router



1	Outside carton for accessories	4	Packing Carton
2	Assembly packaging material	5	Carton sealing tape
3	Cisco ASR 920-10SZ-PD Router	-	

When you receive your chassis, perform the following steps:

1. Inspect the box for any shipping damage. If there is obvious physical damage, contact your Cisco service representative.
2. Unpack the router.
3. Perform a visual inspection of the chassis.
4. Use below table to check the contents of the router shipping container. Do not discard the shipping container. You will need the container if you move or ship the router in the future.

Table 10: Router Default Shipping Container Contents

Component	Description
Chassis	Cisco ASR 920-10SZ-PD or Cisco ASR-920-8S4Z-PD Router chassis
Accessories kit	Chassis rack-mount brackets (19-inch EIA) with eight screws
	Two cable guides with four screws
	Power cord for the DC power supply units
	USB Type-A (male) to USB Type-A (male) cable
Documentation	Cisco ASR 920-10SZ-PD Aggregation Services Router Pointer Card



Note Most Cisco documentation is available online. The Cisco ASR 920-10SZ-PD Aggregation Services Router Pointer Card that is shipped with your Cisco ASR 920-10SZ-PD Router contains links and information about the various documents that are available online.



CHAPTER 3

Installing the Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers

This chapter describes how to install the routers and includes the following sections:



Note Effective July 2018, the Cisco ASR 920-10SZ-PD front panel and case are remodeled. All installation procedures, however, remain the same. The following figure shows the remodeled Cisco ASR 920-10SZ-PD and the Cisco ASR-920-8S4Z-PD router. The difference between the two variants is only the label on the front panel.

- [Prerequisites, on page 31](#)
- [Installing the Router in a Rack, on page 32](#)
- [Installing the Front Cover, on page 36](#)
- [Connect the Chassis Ground and Power, on page 37](#)
- [Power Connection Guidelines, on page 39](#)
- [Assembling and Connecting the DC Power Cable to the Router, on page 41](#)
- [Installing and Removing SFP Modules, on page 43](#)
- [Connecting to the 10/100/1000 Ports, on page 46](#)
- [Connect the Router to the Network, on page 47](#)

Prerequisites

Before installing the router, it is important to prepare for the installation by:

- Preparing the site (site planning) and reviewing the installation plans or method of procedures (MOP). See *Site Planning* section.
- Unpacking and inspecting the router. See *Unpacking and Verifying the Shipped Contents* section.
- Gathering the tools and test equipment required to properly install the router. See *Tools and Equipment* section.

For more instructions on how to prepare for the installation of the router, see *Preparing for Installation*.

Installing the Router in a Rack

The following sections describe how to install the router in a rack. The procedures in this section apply to both horizontal and vertical mounting of the router in a rack:

Installing the Chassis Brackets

The chassis is shipped with mounting brackets that can be installed on the front of the chassis. To install the brackets on the front of the chassis, perform these steps:

Procedure

- Step 1** Remove the rack-mount brackets from the accessory kit and position them beside the router chassis. Figure below shows how to attach the brackets at the front position on the router for a 19-inch EIA rack.

Figure 9: Attaching Mounting Brackets for a 19-inch EIA Rack

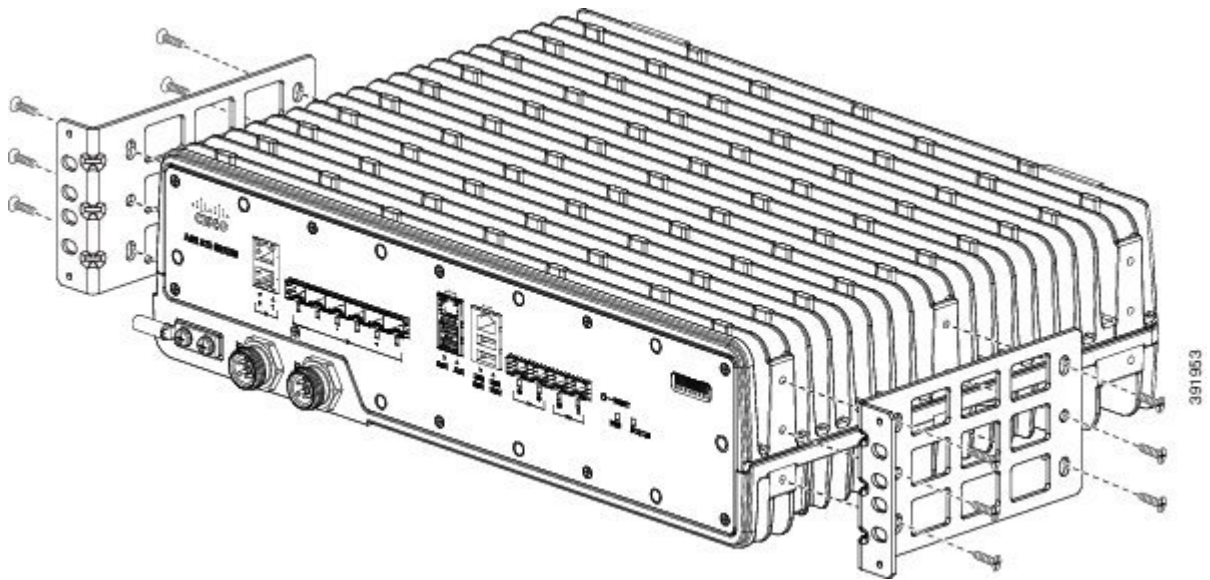
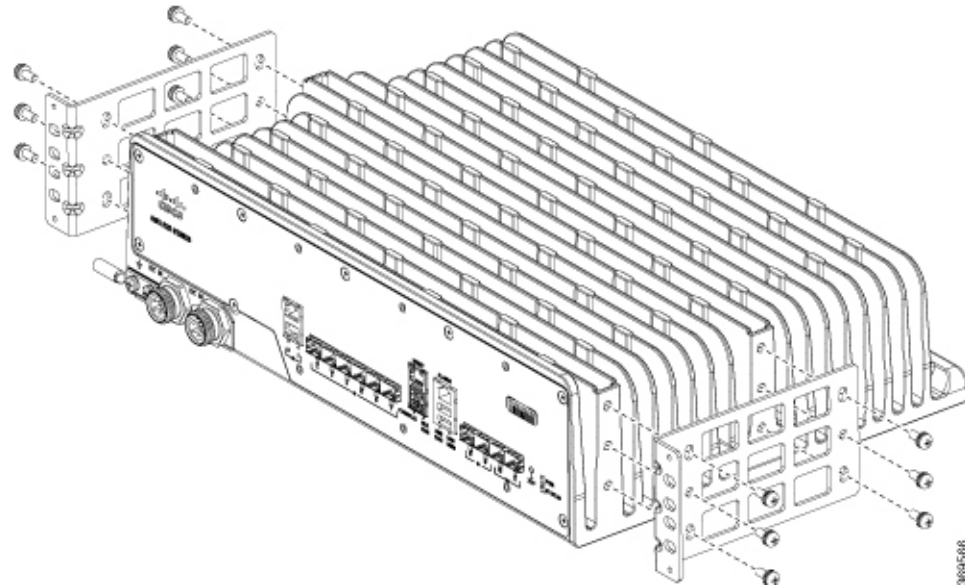


Figure 10: Attaching Mounting Brackets for a 19-inch EIA Rack - Remodeled



- Step 2** Position one of the brackets against the chassis side, and align the screw holes.
- Step 3** Secure the bracket to the chassis with the M5 screws removed when performing Step 1. The recommended maximum torque is 10 in.-lb.
- Step 4** Repeat Step 2 and Step 3 for the other bracket.

Installing the Router Chassis in the Rack



Note Ensure adequate clearance and air flow when mounting the router in a rack. For more information, see the *Clearance Guidelines* section.



Note Install the cable guides before installing the router in a 19-inch EIA rack. See *Attaching the Cable Guides*.

To install the router chassis in the equipment rack, perform these steps:

Procedure

- Step 1** Insert the rear of the chassis between the mounting posts.
- Step 2** Align the mounting holes in the bracket (and optional cable guide) with the mounting holes in the equipment rack.

The following figure shows how to install the router in a 19-inch EIA rack.

Figure 11: Installing the Chassis in a 19-inch EIA Rack

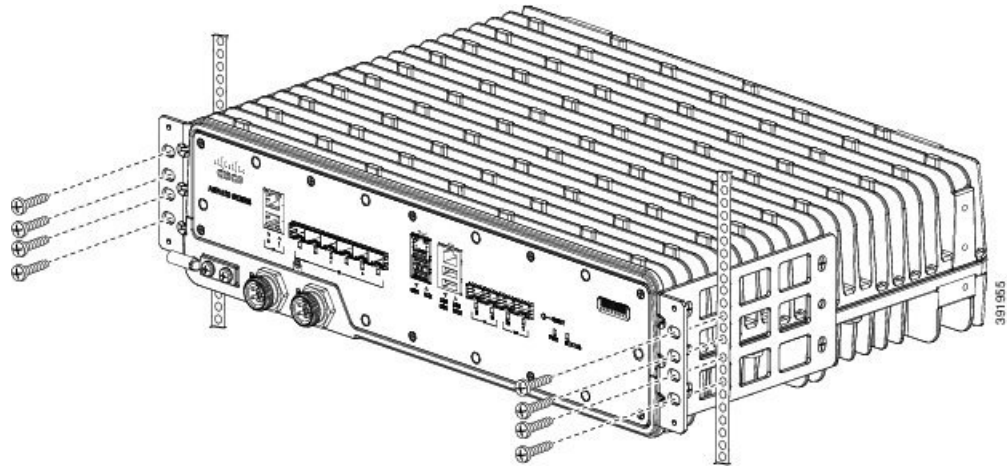
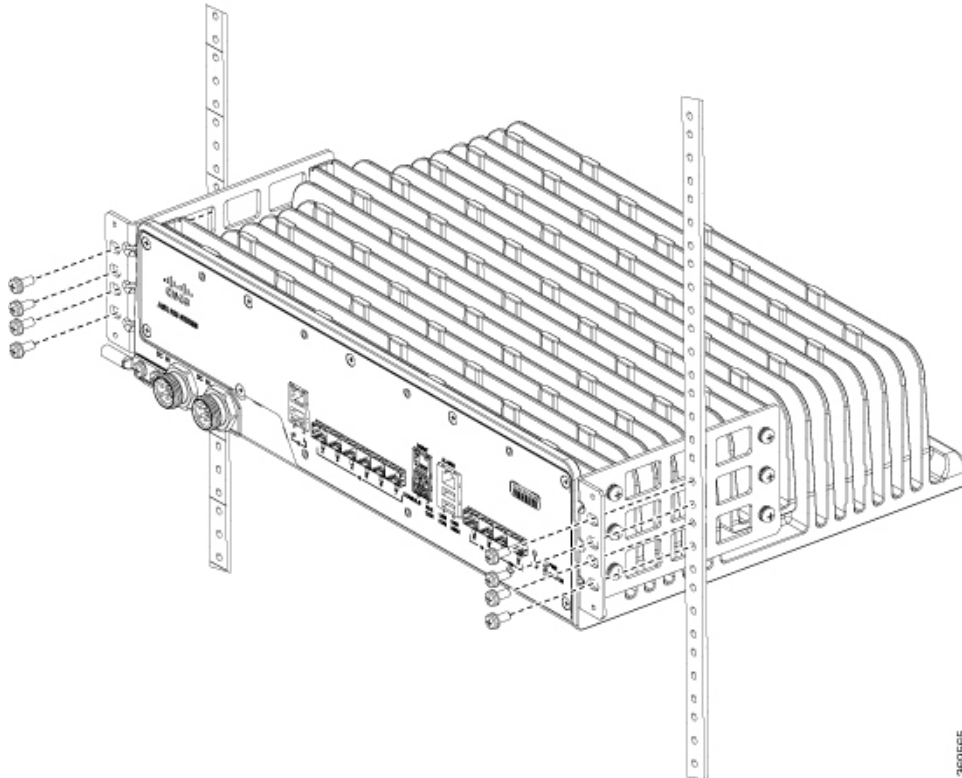


Figure 12: Installing the Chassis in a 19-inch EIA Rack - Remodeled



- Step 3** Install the eight 12-24 x 3/4-inch or 10-32 x 3/4-inch zinc-plated steel screws through the holes in the bracket and into the threaded holes in the equipment rack posts.
- Step 4** Use a tape measure and level to verify that the chassis is installed straight and level.

Attaching the Cable Guides

The router supports the following cable guides:

- A920-CBL-GUIDE-PC (left and right)—help in routing the cables from all components on the front panel thereby enabling a proper cable-bending radius.



Note Assemble the cable guides before installing the chassis on the rack.

To install the cable guides, perform these steps:

Procedure

- Step 1** Position the cable guide-left and cable guide-right against the front of the chassis and align the four screw holes, as shown in figure below.

Figure 13: Cable Guide Installation For 19-inch Rack Brackets

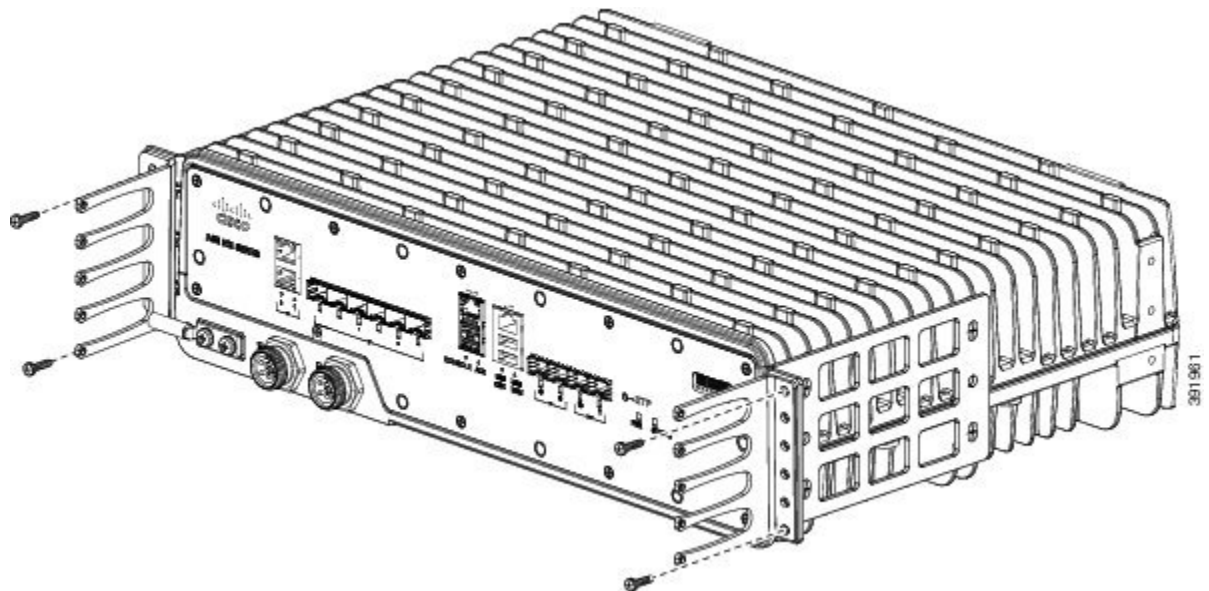
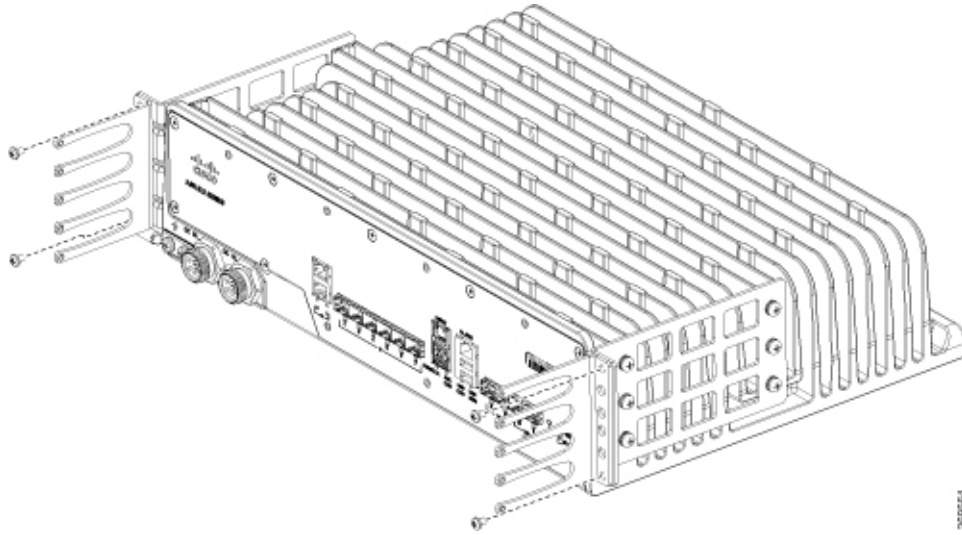


Figure 14: Cable Guide Installation For 19-inch Rack Brackets - Remodeled



- Step 2** Secure the cable guides with the four M4x6mm screws supplied with the cable guide kit. The recommended maximum torque is 10 in-lb (1.12 N-m)

Installing the Front Cover

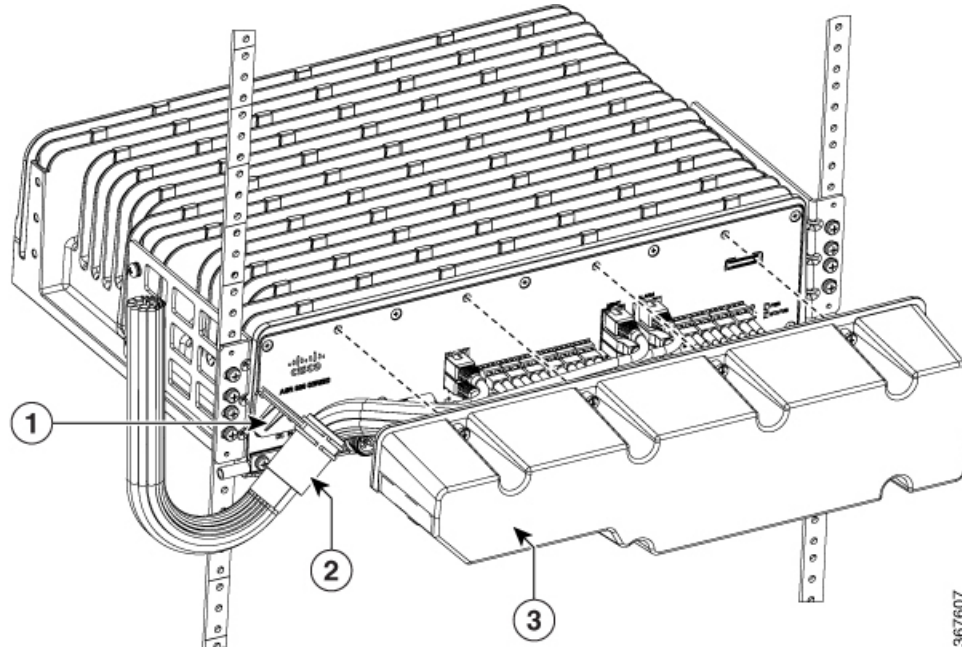
Before you begin

The front cover protects the system from dust. Ensure the disturbance to cable routing is minimal to avoid loss of connection.

Procedure

- Step 1** Place the cable sleeve close to the router.
- Step 2** Secure the fiber or cable bundle in the cable tube. Slide the cable tube into the cable sleeve as shown in the following figure.
- Step 3** Slide the front cover over the cable tube and secure it with the fasteners on the cable cover.

Figure 15: Installing the Front Cover Assembly



1	Cable Sleeve	2	Cable Tube
3	Front Cover	—	—

Watch [Protecting the Cisco ASR 920-10SZ-PD Router](#) (Video).

Connect the Chassis Ground and Power

Before you connect the power or turn on power to the router, you must provide an adequate chassis ground (earth) connection to your router.

Grounding the Router

The router provides a grounding point on either side of the unit for a two-hole lug.



Caution

Before making connections to the router, ensure that you disconnect the power at the circuit breaker. Otherwise it may result in severe injury to yourself, or damage to the router.



Warning

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024



Warning Use copper conductors only. Statement 1025



Warning When installing the unit, the ground connection must always be made first and disconnected last. Statement 42

The following figure shows one of the grounding points of the router, for ease of installation. The other grounding point is on the front panel, which can also be used for grounding the router.

Effective July 2018, the Cisco ASR-920-10SZ-PD rear panel is remodeled. All installation procedures, however, remain the same. The following figure shows the remodeled rear Cisco ASR 920-10SZ-PD Router.

Figure 16: Grounding Point on the Router

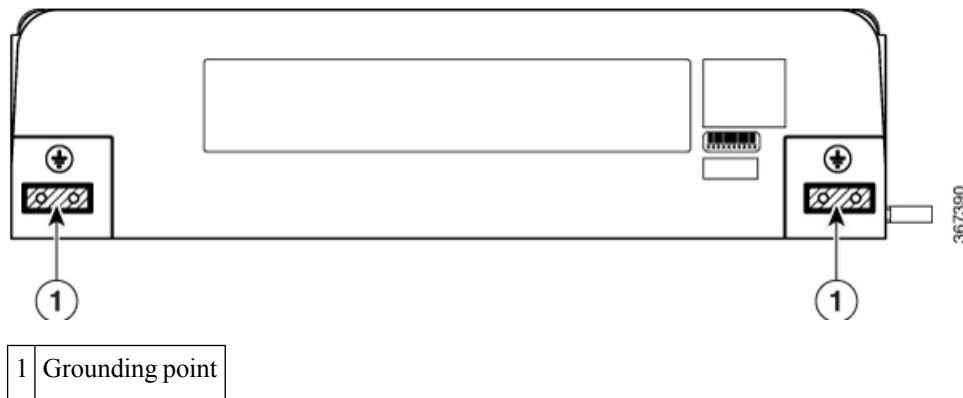
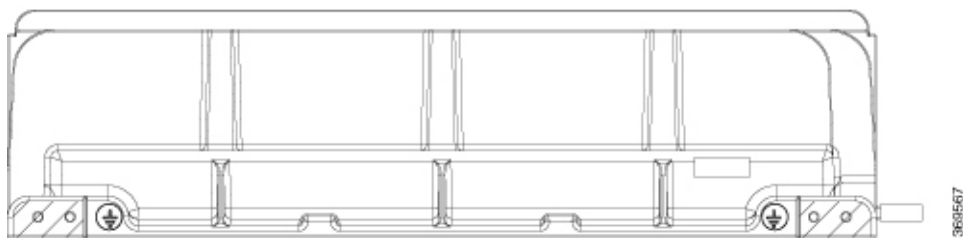


Figure 17: Grounding Point on the Remodeled Router



Perform the steps given below to ground the router using a two-hole lug and the corresponding mounting point. Most routers require a 6-AWG ground connection. Verify your router requirements for the ground connection.

Materials Required

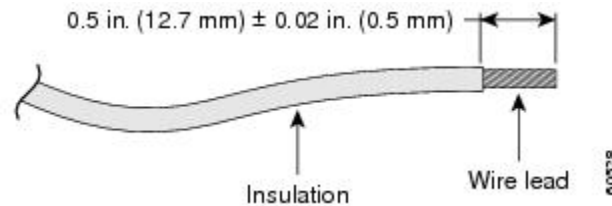
To ensure the chassis ground connection that you provide is adequate, you need the following parts and tools:

- Ratcheting torque screwdriver with Phillips head that exerts up to 15 pound-force inches (lbf-in) of pressure for attaching the ground wire to the router.
- Crimping tool as specified by the ground lug manufacturer.
- 6-AWG or larger copper wire for the grounding wire
- Appropriate wire-stripping tools

Procedure

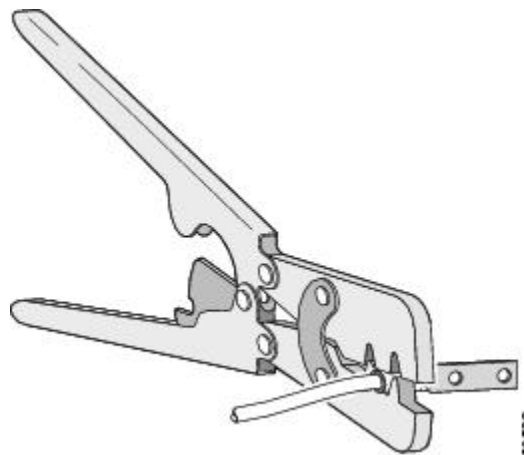
- Step 1** Remove the two-hole lug from the router.
- Step 2** Set the parts aside.
- Step 3** If your ground wire is insulated, use a wire-stripping tool to strip the ground wire to 0.5 inch \pm 0.02 inch (12.7 mm \pm 0.5 mm) for the ring terminal (see the following figure)

Figure 18: Stripping a Ground Wire



- Step 4** Slide the open end of your 2-hole ground lug over the exposed area of the ground wire.
- Step 5** Using a crimping tool (as specified by the ground lug manufacturer), crimp the ground lug to the ground wire as shown in figure below.

Figure 19: Crimping a Ground Lug on to the Ground Wire



- Step 6** Use a Phillips head screwdriver to attach the 2-hole ground lug and wire assembly to the router with the 2 pan-head Phillips head screws.
- Step 7** Connect the other end of the ground wire to a suitable grounding point at your site.

Power Connection Guidelines

This section provides guidelines for connecting the Cisco ASR 920 Series Aggregation Services Router power supplies to the site power source.



Warning Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 213.



Warning The plug-socket combination must be accessible at all times because it serves as the main disconnecting device. Statement 1019.



Warning This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045.

Guidelines for DC-Powered Systems

Basic guidelines for DC-powered systems include the following:

- Each chassis power supply should have its own dedicated input power source. The source must comply with the safety extra-low voltage (SELV) requirements in the UL 60950, CSA 60950, EN 60950, and IEC 60950 standards.
- The circuit must be protected by a dedicated two-pole circuit breaker. The circuit breaker should be sized according to the power supply input rating and local or national code requirements.
- The circuit breaker is considered the disconnect device and should be easily accessible.
- The system ground is the power supply and chassis ground.
- Do not connect the DC return wire to the system frame or to the system-grounding equipment.
- Use the grounding lug to attach a wrist strap for ESD protection during servicing.

Preventing Power Loss

Use the following guidelines to prevent power loss to the router:

- To prevent loss of input power, ensure that the total maximum load on each circuit supplying the power supplies is within the current ratings of the wiring and breakers.
- In some systems, you can use an UPS to protect against power failures at your site. Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the router, which can have substantial current-draw fluctuations due to bursty data traffic patterns.

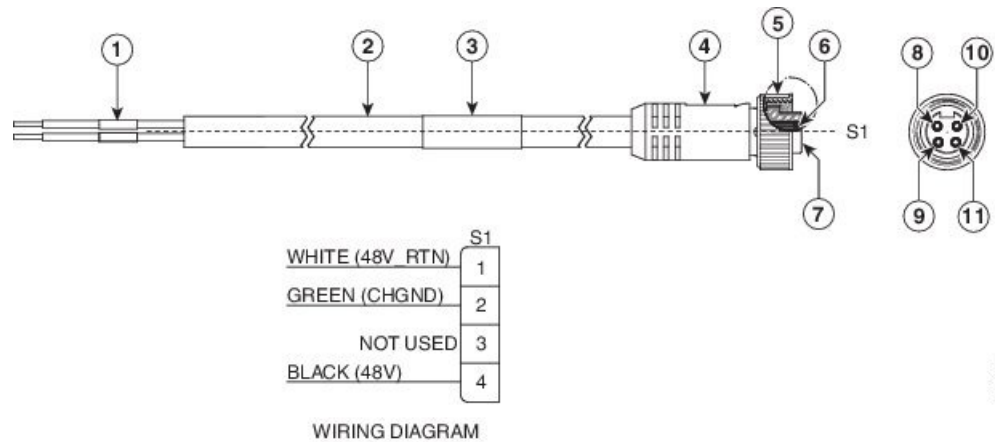
Use the information in the [Table 1](#) to estimate the power requirements and heat dissipation of a router based on a given configuration of the router. Determining power requirements is useful for planning the power distribution system needed to support the router.

Assembling and Connecting the DC Power Cable to the Router

Materials Required

- Three-meter long over-molded power cable marked with positive, negative, and grounding.

Figure 20: Four-pin Power Connector



1	DC plug	5	Coupling nut
2	Cable	6	Contact socket
3	Wrap label	7	Insulator
4	Overmold	8, 9, 10, 11	Contacts

When installing DC power supply, use 14 AWG, 90°C wires. Always ensure that the building's installation for short-circuit (overcurrent) protection does not exceed 15A.



Note A circuit breaker of maximum 15 A should be used.



Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022



Note This equipment is suitable for installation in Network Telecommunications Facilities and locations where the NEC applies. The equipment is suitable for installation as part of the Common Bonding Network (CBN).

**Warning**

Connect the unit only to DC power source that complies with the safety extra-low voltage (SELV) requirements in IEC 60950 based safety standards. Statement 1033

**Caution**

The grounding architecture of this product is DC-isolated (DC-I) for DC-powered products. DC-powered products have a nominal operating DC voltage of 24V and -48 VDC.

Before You Begin

When powering the router with DC power, you must ensure that DC power can be conveniently removed from the unit. The power should not be removed by disconnecting the DC power connector on the unit.

Procedure

Procedure

-
- Step 1** Fix the connector side to the router.
 - Step 2** Ensure that the notch on the connector is aligned with the contact socket on the cable. See Four-pin Power Connector figure .
 - Step 3** Tighten coupling nut fully so that the connector is fastened to the router.
-

Powering On the Router

After the router is rack mounted, perform these tasks to complete the installation:

- Power on the router.
- Connect the front-panel ports. See the *Connecting to SFP Modules* section, to complete the installation.

Activating the DC Power Supply

Perform the following procedure to activate a DC power supply:

Procedure

-
- Step 1** Remove the tape from the circuit-breaker router handle, and restore power by moving the circuit-breaker router handle to the On (I) position.
 - Step 2** Verify power supply operation by checking if the front panel LED (PWR) is ON.

Note If you are connecting a redundant DC power supply, it is recommended that each power supply be connected to a separate power source in order to prevent power loss in the event of a power failure.

Installing and Removing SFP Modules

These sections describe how to install and remove SFP modules. The modules are inserted into the SFP module slots as depicted in *Installing an SFP Module into an SFP Module Slot* figure. These field-replaceable modules provide interfaces.

See the Supported SFPs and PIDs for the list of SFP modules that the router supports. Each port must match the wavelength specifications on the other end of the cable. For reliable communications, the cable must not exceed the stipulated cable length.

Use only Cisco SFP modules on the Cisco router. Each SFP module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for Cisco to identify and validate that the SFP module meets the requirements for the router.

For detailed instructions on installing, removing, and cabling the SFP module, see the *SFP module* documentation.

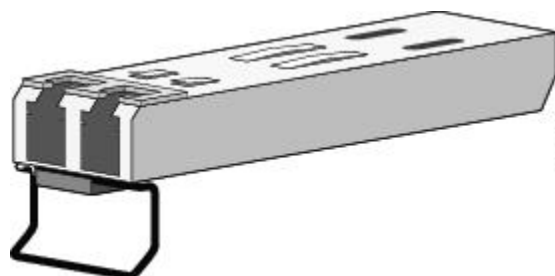
Installing SFP Modules

Figure below shows an SFP module that has a bale-clasp latch.



Caution We strongly recommend that you do not install or remove fiber-optic SFP modules with cables attached because of the potential damage to the cables, the cable connector, or the optical interfaces in the SFP module. Disconnect all cables before removing or installing an SFP module. Removing and installing an SFP module can shorten its useful life. Do not remove and insert SFP modules more often than is absolutely necessary.

Figure 21: SFP Module with a Bale-Clasp Latch



To insert an SFP module into the module slot, follow these steps:

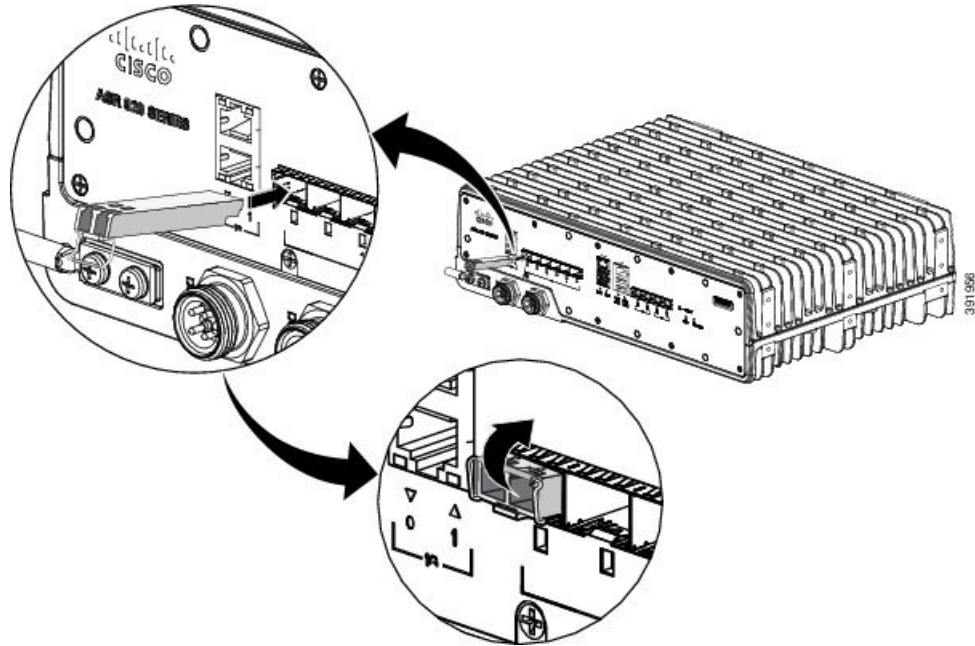
Procedure

Step 1 Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.

Some SFP modules identify the top side of the module with send (TX) and receive (RX) markings or arrows that show the direction of the connection.

- Step 2** If the SFP module that you are using has the markings, use them to identify the top side of the module.
- Step 3** Align the SFP module in front of the slot opening.
- Step 4** Insert the SFP module into the slot until you feel the connector on the module snap into place in the rear of the slot.

Figure 22: Installing an SFP Module into an SFP Module Slot



Caution Do not remove the dust plugs from the fiber-optic SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light. Store the dust plugs for later use.

- Step 5** Insert the cable connector into the SFP module:
- For fiber-optic SFP modules, insert the LC cable into the SFP module.
 - For copper 1000BASE-T SFP modules, insert the RJ-45 cable connector into the SFP module.

Removing SFP Modules

To remove an SFP module from a module receptacle, follow these steps:

Procedure

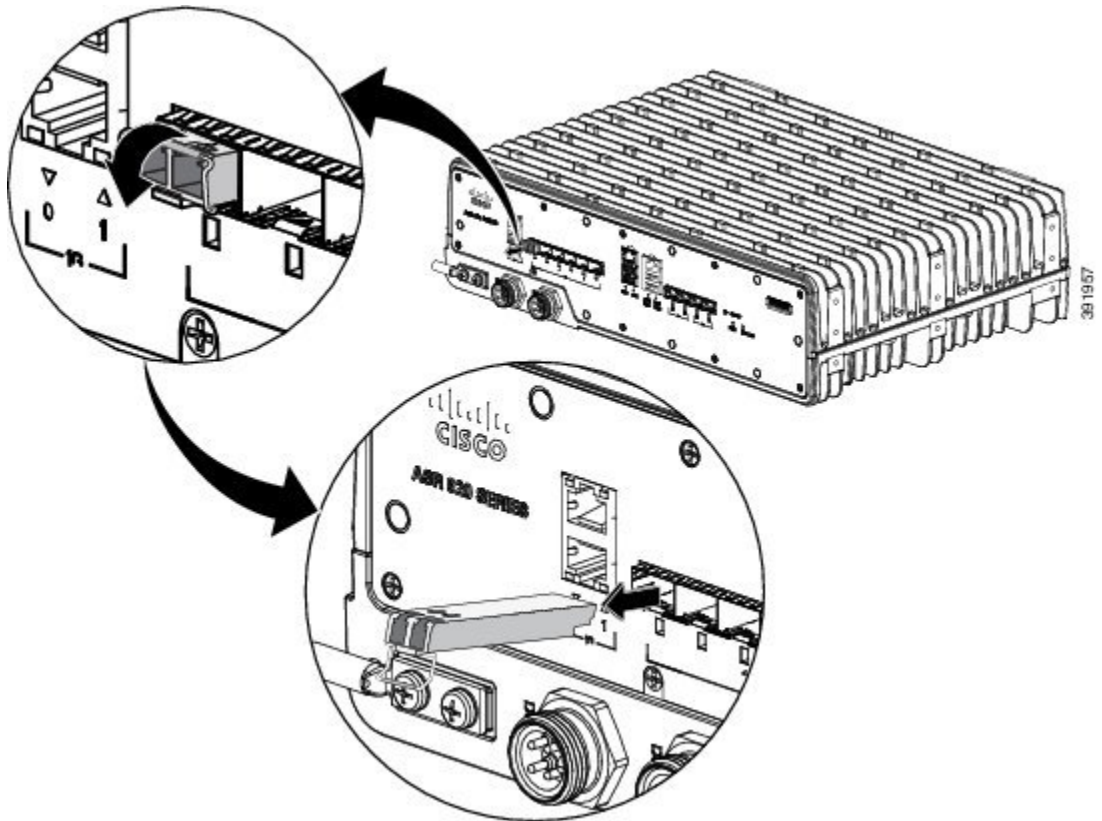
- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.
- Step 2** Disconnect the cable from the SFP module, and insert a dust plug into the cable end.

Tip For reattachment, note which cable connector plug is send (TX) and which is receive (RX).

Step 3 Unlock and remove the SFP module, as shown in the following figure.

If the module has a bale-clasp latch, pull the bale out and down to eject the module. If the bale-clasp latch is obstructed and you cannot use your index finger to open it, use a small, flat-blade screwdriver or other long, narrow instrument to open the bale-clasp latch.

Figure 23: Removing a Bale-Clasp Latch SFP Module



Step 4 Grasp the SFP module between your thumb and index finger, and carefully remove it from the module slot.

Step 5 For fiber-optic SFP modules, insert a dust plug into the optical ports of the SFP module to keep the optical interfaces clean.

Step 6 Place the removed SFP module in an antistatic bag or other protective environment.

Connecting to the 10/100/1000 Ports



Note The router 10/100/1000 ports configure themselves to operate at the speed of attached devices. If the attached ports do not support autonegotiation, you can explicitly set the speed and duplex parameters. Connecting devices that do not autonegotiate or that have their speed and duplex parameters manually set can reduce performance or result in no linkage.

To maximize performance, choose one of these methods for configuring the Ethernet ports:

- Let the ports autonegotiate both speed and duplex.
- Set the port speed and duplex parameters on both ends of the connection.

Procedure

Step 1 When connecting to workstations, servers, and routers, connect a straight-through cable to an RJ-45 connector on the front panel. When connecting to routers or repeaters, use a crossover cable.

Step 2 Connect the other end of the cable to an RJ-45 connector on the other device. The port LED turns on when both the router and the connected device have established link.

If the port LED turns Yellow, the device at the other end might not be turned on, or there might be a cable problem or a problem with the adapter installed in the attached device.

Note On network interface ports, the port LED is green after the link is established.

Step 3 Reconfigure and reboot the connected device, if necessary.

Step 4 Repeat Steps 1 through 3 to connect each device.

Connecting to SFP Modules

This section describes how to connect to SFP modules. For instructions on how to connect to fiber-optic SFP modules, see the *Connecting to Fiber-Optic SFP Modules*.

For instructions about how to install or remove an SFP module, see the *Installing and Removing SFP Modules*.

Connecting to Fiber-Optic SFP Modules

Follow these steps to connect a fiber-optic cable to an SFP module:



Warning Class 1 laser product. Statement 1008



Caution Do not remove the rubber plugs from the SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light.

Procedure

Step 1 Remove the rubber plugs from the module port and fiber-optic cable, and store them for future use.

Step 2 Insert one end of the fiber-optic cable into the SFP module port.

Step 3 Insert the other cable end into a fiber-optic connector on a target device.

Step 4 Observe the port status LED.

The LED turns green when the router and the target device have an established link.

If the LED turns Yellow, the target device might not be turned on, there might be a cable problem, or there might be problem with the adapter installed in the target device.

Step 5 If necessary, reconfigure and restart the router or target device.

Connect the Router to the Network

The following sections describe how to connect a router to the network:



Note Connect only SELV services to all the router ports.

Connect Console Cables

The following sections describe how to connect to the router using console cables:

Connecting to the USB Serial Port Using Microsoft Windows

This procedure shows how to connect to the USB serial port using Microsoft Windows.



Note Install the USB device driver before establishing a physical connection between the router and the PC, by using the USB console cable plugged into the USB serial port. Otherwise, the connection will fail. For more information, see the *Installing the Cisco USB Device Driver* section.

Procedure

Step 1 Connect a USB Type A-to-Type A cable to the USB console port, as shown in figure below.

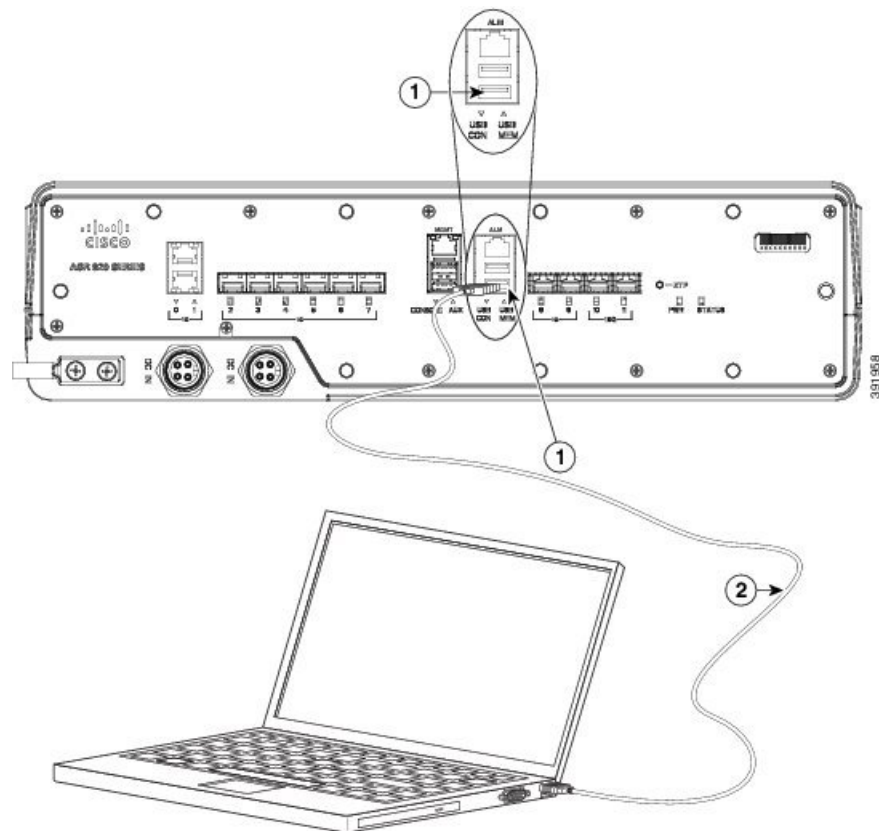
Note You cannot use the USB port and the EIA port concurrently. When the USB port is used, it takes priority over the EIA port.

Step 2 Connect the USB Type A cable to the PC.

Step 3 To communicate with the router, start a terminal emulator application, such as Microsoft Windows HyperTerminal. This software should be configured with the following parameters:

- 9600 baud
- 8 data bits
- no parity
- 1 stop-bit
- no flow control

Figure 24: Connecting the USB Console Cable to the router



Label	Cable	Label	Cable
1	USB Type-A console port	2	USB Type-A (male) to USB Type-A (male) console cable

Connecting to the Console Port Using Mac OS X

This procedure describes how to connect a Mac OS X system USB port to the console using the built-in OS X terminal utility.

Procedure

- Step 1** Use the Finder to choose Applications > Utilities > Terminal.
- Step 2** Connect the OS X USB port to the router.
- Step 3** Enter the following commands to find the OS X USB port number:

Example:

```
macbook:user$ cd /dev
macbook:user$ ls -ltr /dev/*usb*
crw-rw-rw- 1 root  wheel          9,  66 Apr  1 16:46 tty.usbmodem1a21 DT-macbook:dev user$
```

- Step 4** Connect to the USB port with the following command followed by the router USB port speed:

Example:

```
macbook:user$ screen /dev/tty.usbmodem1a21 9600
```

To disconnect the OS X USB console from the terminal window, enter **Ctrl-a** followed by **Ctrl-**

Connecting to the Console Port Using Linux

This procedure shows how to connect a Linux system USB port to the console using the built-in Linux terminal utility.

Procedure

- Step 1** Open the Linux terminal window.
- Step 2** Connect the Linux USB port to the router.
- Step 3** Enter the following commands to find the Linux USB port number:

Example:

```
root@usb-suse# cd /dev
root@usb-suse /dev# ls -ltr *ACM*
crw-r--r-- 1 root  root          188,  0 Jan 14 18:02 ttyACM0
root@usb-suse /dev#
```

- Step 4** Connect to the USB port with the following command, followed by the router USB port speed:

Example:

```
root@usb-suse /dev# screen /dev/ttyACM0 9600
```

To disconnect the Linux USB console from the terminal window, enter **Ctrl-a** followed by **:** then **quit**

Installing the Cisco USB Device Driver

A USB device driver must be installed the first time a Microsoft Windows-based PC is connected to the USB serial port on the router.

This procedure describes how to install the Microsoft Windows USB device driver in Microsoft Windows XP, Windows Vista, Windows 2000, Windows 7, and Windows 8. Download the driver for your router model from the Tools and Resources Download Software site, USB Console Software category, at:

<https://software.cisco.com/download/home/726037604&fid=71056&softwareid=2885122&class=313&cid=AVAILABLE&cidtype=best>



Note To download the driver, you must have a valid service contract associated to your Cisco.com profile.

Procedure

- Step 1** Unzip the file asr-9xx_usbconsole_drivers.zip.
- Step 2** Double-click xrusbser_ver2100_installer.exe in the XR21x141x-Win-DriversOnly-Vers2.1.0.0/EXE folder. Installation Wizard GUI is displayed.
- Step 3** Click Next. The InstallShield Wizard Completed window is displayed.
- Step 4** Click Finish.
- Step 5** Connect the USB cable to the PC and router USB console ports. Follow the on-screen instructions to complete the installation of the driver.
- Step 6** XR21V1401 USB UART Device driver successfully installed message is displayed.
The USB console is ready for use.

Uninstalling the Cisco USB Driver

This procedure describes how to uninstall the Microsoft Windows USB device driver in Microsoft Windows XP, Windows Vista, Windows 2000, Windows 7, and Windows 8.



Note Disconnect the router console terminal before uninstalling the driver.

Procedure

- Step 1** Choose Start > Control Panel > Add or Remove Programs.

- Step 2** Scroll to **Windows Driver Package - Exar corporation (xrusbser) Ports** and click **Remove**. The **Program Maintenance** window is displayed.
- Step 3** Click **Yes** to uninstall the driver.
-

Connecting to the EIA Console Port



Note The USB-to-RJ45 adapter cable and the DB9 console cable are not included with the router; they can be ordered separately from Cisco.



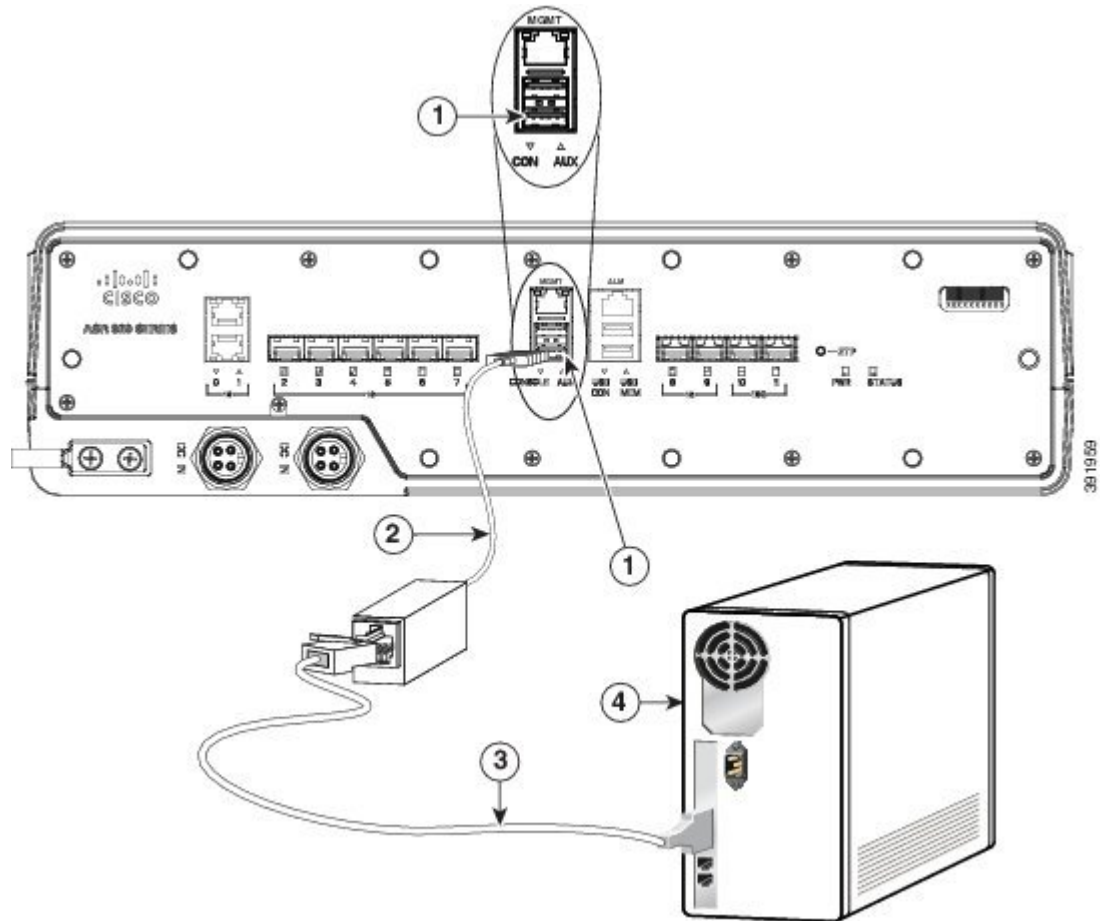
Note The serial console cable kit is not included with the router; it is ordered separately.

To connect a terminal to the EIA Console port on the router, follow these steps:

Procedure

- Step 1** Connect the USB end of the USB-to RJ-45 cable to the EIA Console port.
- Step 2** Connect the RJ-45 end of the DB-9 adapter cable to the USB-to RJ-45 cable, as shown in figure below.

Figure 25: Connecting a Terminal to the Router



Label	Component	Label	Component
1	EIA Console port	3	RJ-45 to DB-9 cable
2	USB-to-RJ45 adapter	4	Desktop or system

Step 3 Connect the DB-9 end of the console cable to the DB-9 end of the terminal.

Step 4 To communicate with the router, start a terminal emulator application, such as Microsoft Windows HyperTerminal. This software should be configured with the following parameters:

- 9600 baud
- 8 data bits
- no parity
- 1 stop-bit
- no flow control

Connect a Management Ethernet Cable



Note It is recommended that you retain the RJ-45 dust caps for the ports (RJ-45, SFP, and USB ports) that are not used.

When using the Ethernet Management port in the default mode (speed-auto and duplex-auto) the port operates in the auto-MDI/MDI-X mode. The port automatically provides the correct signal connectivity through the Auto-MDI/MDI-X feature. The port automatically senses a crossover or straight-through cable and adapts to it.

However, when the Ethernet Management port is configured to a fixed speed (10, 100, or 1000 Mbps) through command-line interface (CLI) commands, the port is forced to the MDI mode.

When in a fixed-speed configuration and MDI mode:

- Use a crossover cable to connect to an MDI port
- Use a straight-through cable to connect to an MDI-X port



Note To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the Management Ethernet ports only to intra-building or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring.

Install and Remove SFP and SFP+ Modules

The router supports a variety of SFP and SFP+ modules, including optical and Ethernet modules. For information on how to install and remove SFP and SFP+ modules, see the documentation for the SFP or SFP+ module at:

http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod_installation_guides_list.html

For information about inspecting and cleaning fiber-optic connections see, http://www.cisco.com/en/US/partner/tech/tk482/tk876/technologies_white_paper09186a0080254eba.shtml



Caution We recommend that you wait for 30 seconds between the removal and insertion of an SFP on an interface module. We recommend this to allow the transceiver software to initialize and synchronize with the router. Changing an SFP more quickly could result in transceiver initialization issues that disable the SFP.

Connecting a USB Flash Device

To connect a USB flash device to the router, remove the dust cap and insert the memory stick in the USB port labeled USB MEM.

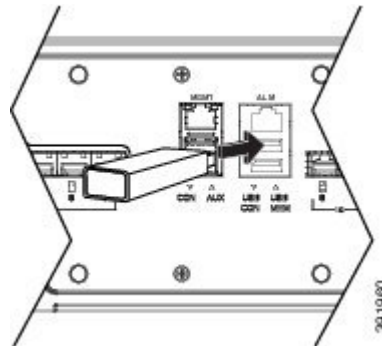


Note Retain the dust caps for later use.

The Flash memory module can be inserted only one way, and can be inserted or removed regardless of whether the router is powered up or not.

Figure below shows the USB port connector on the router.

Figure 26: Router Flash Token Memory Stick



Removing and Replacing a USB Flash Device

To remove and replace a USB flash token memory stick from and into a router, follow these steps:



Note If the USB flash device is abruptly removed, the constant sync operations of the file system in progress fail due to the USB device removal. These errors occur with ext2 or ext3 or ext4 file systems and are not seen with fat32 file system. This is a default behavior on any Linux platform.

The following error messages are displayed when you remove the USB device:

```
*Jun 24 10:29:45.766: %IOSXE-3-PLATFORM: R0/0: kernel: EXT2-fs (sda1): previous I/O error
to superblock detected
*Jun 24 10:29:45.878: %IOSXE-3-PLATFORM: R0/0: kernel: EXT2-fs (sda1): previous I/O error
to superblock detected
*Jun 24 10:29:46.012: %IOSXE-3-PLATFORM: R0/0: kernel: EXT2-fs (sda1): previous I/O error
to superblock detected
*Jun 24 10:29:46.013: %IOSXE-3-PLATFORM: R0/0: kernel: EXT2-fs (sda1): previous I/O error
to superblock detected
```

Procedure

Step 1 Execute the `eject usb0:` command before removing the USB from the router.

Example:

```
rommon 2 > eject usb0
rommon 2 >
```

If you do not run this command before removing the USB, the following error message is displayed:

```
rommon 2 > dir usb0:
usb_stor_BBB_comdat:usb_bulk_msg error
failed to send CBW status 34
RESET:stall
usb_stor_BBB_comdat:usb_bulk_msg error
failed to send CBW status 34
RESET:stall
usb_stor_BBB_comdat:usb_bulk_msg error
```

- Step 2** Pull the memory stick from the USB port.
- Step 3** To replace the Cisco USB Flash memory stick, simply insert the module into the USB port labeled USB MEM, as shown in router Flash Token Memory Stick figure. The Flash memory module can be inserted only one way, and can be inserted or removed regardless of whether the router is powered up or not.

Note If you are permanently removing the USB Flash device, reinstall the dust cap in the USB port.

Connecting Ethernet Cables



Note To achieve good performance, it is recommended to use Shielded Twisted Pair (STP) Cat 5E/Cat 6 cables for all RJ-45 ports on the router.

The router interface modules support RJ-45 and Ethernet SFP ports. For instructions on how to connect cables to Ethernet SFP ports, see the *Connecting Cables to SFP Modules*.

The RJ-45 port supports standard straight-through and crossover Category 5E unshielded twisted-pair (UTP) cables. Cisco does not supply Category 5E UTP cables; these cables are available commercially.



Note To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the Gigabit Ethernet ports only to intra-building or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intra-building port(s) of the equipment or subassembly must not be metallicly connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallicly to OSP wiring.

Follow these steps to connect a cable to a copper Gigabit Ethernet port:

Procedure

- Step 1** Connect one end of the cable to the Gigabit Ethernet port on the router.
- Step 2** Connect the other end to the BTS patch or demarcation panel at your site.

Connect Cables to SFP Modules

For information on connecting cables to Cisco optical and Ethernet SFP interfaces, see:

http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod_installation_guides_list.html.

Connector and Cable Specifications

For more information on cable specifications and pinouts, see [Troubleshooting](#).



CHAPTER 4

Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers Initial Configuration

This chapter guides you through a basic router configuration, which is sufficient for you to access your network. Complex configuration procedures are beyond the scope of this publication and can be found in the modular configuration and modular command reference publications in the Cisco IOS-XE software configuration documentation set that corresponds to the software release installed on your Cisco hardware.

To configure Cisco ASR 920-10SZ-PD and Cisco ASR-920-8S4Z-PD Routers from a console, connect a terminal to the router console port.

This chapter contains the following sections:

- [Checking Conditions Prior to System Startup](#), on page 57
- [Powering Up the Router](#), on page 57
- [Configuring the Router at Startup](#), on page 62
- [Safely Powering Off the Router](#), on page 65

Checking Conditions Prior to System Startup

Ensure that the following conditions are addressed before starting up the router:

- The optional Gigabit Ethernet Management port cable is installed.
- The chassis is securely mounted and grounded.
- The power and interface cables are connected.
- Your PC with terminal emulation program (HyperTerminal or equivalent) is connected to the console port and powered up.
- Your PC terminal emulation program is configured for 9600 baud, 8 data bits, 1 stop-bit, no parity, and no flow control is set to none.
- You have selected passwords for access control.
- You have determined the IP addresses for the Ethernet and serial interfaces.

Powering Up the Router

After installing your router and connecting cables, start the router and follow these steps:

Procedure

Step 1 Switch on the power supply.

Caution Do not press any keys on the keyboard until the messages stop and the PWR LED is solid green. Any keys pressed during this time are interpreted as the first command typed when the messages stop, which might cause the router to power off and start over. It takes a few minutes for the messages to stop.

Step 2 Observe the initialization process. When the system boot is complete (the process takes a few seconds), the router begins to initialize.

Example:

Loading the Default System Boot Image

```
System Bootstrap, Version 15.4(3r)S4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2014 by cisco Systems, Inc.
Compiled Fri 20-Jun-14 17:24 by alnguyen
Boot ROM1
Last reset cause: PowerOn
UEA platform with 3670016 Kbytes of main memory

rommon 1 > boot tftp://tftpboot/master/asr920-universalk9_npe.2014-05-24_13.14_gurathi.bin

IP_ADDRESS: 7.43.18.118
IP_SUBNET_MASK: 255.255.0.0
DEFAULT_GATEWAY: 7.43.0.1
TFTP_SERVER: 202.153.144.25
TFTP_FILE: /tftpboot/master/asr920-universalk9_npe.2014-05-24_13.14_gurathi.bin
TFTP_MACADDR: 00:00:00:aa:bb:cc
TFTP_VERBOSE: Progress
TFTP_RETRY_COUNT: 18
TFTP_TIMEOUT: 7200
TFTP_CHECKSUM: No
ETHER_PORT: 2
ETHER_SPEED_MODE: Auto Detect
link up 100Mbps/FD.....
TFTP error 1 received (File not found).
TFTP: Operation terminated.
boot: netboot failed
rommon 2 > boot tftp://tftpboot/master/asr920-universalk9_npe.2014-05-24_13.14_gurathi.bin

IP_ADDRESS: 7.43.18.118
IP_SUBNET_MASK: 255.255.0.0
DEFAULT_GATEWAY: 7.43.0.1
TFTP_SERVER: 202.153.144.25
TFTP_FILE: /tftpboot/master/asr920-universalk9_npe.2014-05-24_13.14_gurathi.bin
TFTP_MACADDR: 00:00:00:aa:bb:cc
TFTP_VERBOSE: Progress
TFTP_RETRY_COUNT: 18
TFTP_TIMEOUT: 7200
TFTP_CHECKSUM: No
ETHER_PORT: 2
ETHER_SPEED_MODE: Auto Detect
link up 100Mbps/FD.....
Receiving /tftpboot/master/asr920-universalk9_npe.2014-05-24_13.14_gurathi.bin from
202.153.144.25
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
File reception completed.
```



```
Boot image size = 257997384 (0xf60ba48) bytes

Package header rev 0 structure detected
Calculating SHA-1 hash...done
validate_package: SHA-1 hash:
calculated ec733062:920bcf8a:84672876:3efde19d:4776fa0b
expected ec733062:920bcf8a:84672876:3efde19d:4776fa0b
Image validated
Passing control to the main image..
%IOSXEBOOT-4-DEBUG_CONF: (rp/0): Using DEBUG_CONF file /bootflash/debug.conf
%IOSXEBOOT-4-WATCHDOG_DISABLED: (rp/0): Hardware watchdog timer disabled: disabled by
BOOT_PARAM
Jul 15 20:21:13.690 R0/0: %PMAN-3-PROCFAIL_IGNORE: All process exits and failures are being
ignored due to debug settings. Normal router functionality will be affected. Critical
router functions like RP switchover, router reload, FRU resets, etc. may not function
properly.

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San Jose, California 95134-1706

Cisco IOS Software, ASR920 Software (PPC_LINUX_IOSD-UNIVERSALK9_NPE-M), Experimental Version
 15.5(20140522:163448) [mcp_dev-gurathi-SFPP_ios 120]
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or the applicable URL provided on the flyer accompanying the IOS-XE
software.

This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

cisco ASR-920 (Freescale P2020) processor (revision 1.0 GHz) with 706041K/6147K bytes of
memory.
```

```

Processor board ID CAT1740U01B
12 Gigabit Ethernet interfaces
2 Ten Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
2097152K bytes of physical memory.
1328927K bytes of SD flash at bootflash:.

```

Warning: When Cisco determines that a fault or defect can be traced to the use of third-party transceivers installed by a customer or reseller, then, at Cisco's discretion, Cisco may withhold support under warranty or a Cisco support program. In the course of providing support for a Cisco networking product Cisco may require that the end user install Cisco transceivers if Cisco determines that removing third-party parts will assist Cisco in diagnosing the cause of a support issue.

Press RETURN to get started!

```

*Jul 15 20:22:08.531: %SMART_LIC-6-AGENT_READY: Smart Agent for Licensing is initialized
*Jul 15 20:22:08.564: %SMART_LIC-6-AGENT_ENABLED: Smart Agent for Licensing is enabled
Redundancy license not released

*Jul 15 20:22:24.239: dev_pluggable_optics_selftest attribute table internally inconsistent
@ 0x129

*Jul 15 20:22:24.821: pak_debug_init: Successfully initialized pak debug trace buffer
*Jul 15 20:22:25.466: %SPANNTREE-5-EXTENDED_SYSID: Extended SysId enabled for type vlanCannot
Get the number of ports in MAC notification

*Jul 15 20:22:29.043: %LINK-3-UPDOWN: Interface Lsmpi0, changed state to up
*Jul 15 20:22:29.044: %LINK-3-UPDOWN: Interface EOBC0, changed state to up
*Jul 15 20:22:29.045: %LINEPROTO-5-UPDOWN: Line protocol on Interface LI-Null0, changed
state to up
*Jul 15 20:22:29.045: %LINK-5-CHANGED: Interface GigabitEthernet0, changed state to
administratively down
*Jul 15 20:22:29.046: %LINK-3-UPDOWN: Interface LIIN0, changed state to up
*Jul 15 20:22:29.793: %LINEPROTO-5-UPDOWN: Line protocol on Interface Lsmpi0, changed state
to up
*Jul 15 20:22:29.794: %LINEPROTO-5-UPDOWN: Line protocol on Interface EOBC0, changed state
to up
*Jul 15 20:22:29.794: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0,
changed state to down
*Jul 15 20:22:29.795: %LINEPROTO-5-UPDOWN: Line protocol on Interface LIIN0, changed state
to up
*Jul 15 20:22:33.724: Bulk port license Activated

*Jul 15 20:22:34.194: %SYS-5-CONFIG_I: Configured from memory by console
*Jul 15 20:22:34.333: %IOSXE_OIR-6-REMSPA: SPA removed from subslot 0/0, interfaces disabled
*Jul 15 20:22:34.479: %SPA_OIR-6-OFFLINECARD: SPA (12xGE-2x10GE-FIXED) offline in subslot
0/0
*Jul 15 20:22:34.495: %IOSXE_OIR-6-INSCARD: Card (fp) inserted in slot F0
*Jul 15 20:22:34.495: %IOSXE_OIR-6-ONLINECARD: Card (fp) online in slot F0
*Jul 15 20:22:34.496: %IOSXE_OIR-6-INSCARD: Card (cc) inserted in slot 0
*Jul 15 20:22:34.497: %IOSXE_OIR-6-ONLINECARD: Card (cc) online in slot 0
*Jul 15 20:22:34.563: %IOSXE_OIR-6-INSSPA: SPA inserted in subslot 0/0
*Jul 15 20:22:34.847: %SYS-5-RESTART: System restarted --
Cisco IOS Software, ASR920 Software (PPC_LINUX_IOSD-UNIVERSALK9_NPE-M), Experimental Version
15.5(20140522:163448) [mcp_dev-gurathi-SFPP_ios 120]
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Sat 24-May-14 13:07 by gurathi
Authentication passed

*Jul 15 20:22:46.780: %SYS-6-BOOTTIME: Time taken to reboot after reload = 868 seconds
*Jul 15 20:22:51.205: %CALL_HOME-6-CALL_HOME_ENABLED: Call-home is enabled by Smart Agent
for Licensing.

```

```
*Jul 15 20:22:51.209: %PKI-4-NOCONFIGAUTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
*Jul 15 20:23:18.504: %TRANSCEIVER-6-INSERTED:iomd: transceiver module inserted in
GigabitEthernet0/0/0
*Jul 15 20:23:18.517: %TRANSCEIVER-6-INSERTED:iomd: transceiver module inserted in
GigabitEthernet0/0/1
*Jul 15 20:23:18.536: %TRANSCEIVER-6-INSERTED:iomd: transceiver module inserted in
GigabitEthernet0/0/4
*Jul 15 20:23:18.542: %TRANSCEIVER-6-INSERTED:iomd: transceiver module inserted in
GigabitEthernet0/0/5
*Jul 15 20:23:18.548: %TRANSCEIVER-6-INSERTED:iomd: transceiver module inserted in
GigabitEthernet0/0/6
*Jul 15 20:23:18.554: %TRANSCEIVER-6-INSERTED:iomd: transceiver module inserted in
GigabitEthernet0/0/7
*Jul 15 20:23:18.586: %TRANSCEIVER-6-INSERTED:iomd: transceiver module inserted in
TenGigabitEthernet0/0/12
*Jul 15 20:23:18.593: %TRANSCEIVER-6-INSERTED:iomd: transceiver module inserted in
TenGigabitEthernet0/0/13
*Jul 15 20:23:20.525: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/1, changed state to down
*Jul 15 20:23:20.525: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/2, changed state to down
*Jul 15 20:23:20.525: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/3, changed state to down
*Jul 15 20:23:20.573: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/4, changed state to down
*Jul 15 20:23:20.574: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/5, changed state to down
*Jul 15 20:23:20.574: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/6, changed state to down
*Jul 15 20:23:20.574: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/7, changed state to down
*Jul 15 20:23:20.574: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/8, changed state to down
*Jul 15 20:23:20.574: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/9, changed state to down
*Jul 15 20:23:20.574: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/10, changed state to
down
*Jul 15 20:23:20.623: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/11, changed state to
down
*Jul 15 20:23:20.623: %LINK-3-UPDOWN: Interface TenGigabitEthernet0/0/12, changed state to
down
*Jul 15 20:23:20.623: %LINK-3-UPDOWN: Interface TenGigabitEthernet0/0/13, changed state to
down
*Jul 15 20:23:22.318: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/0, changed state to
down[OK]
*Jul 15 20:23:28.733: %SPA_OIR-6-ONLINECARD: SPA (12xGE-2x10GE-FIXED) online in subslot 0/0
*Jul 15 20:23:42.197: %TRANSCEIVER-3-NOT_COMPATIBLE:iomd: Detected for transceiver module
in GigabitEthernet0/0/6, module disabled
*Jul 15 20:23:42.212: %TRANSCEIVER-3-NOT_COMPATIBLE:iomd: Detected for transceiver module
in GigabitEthernet0/0/7, module disabled
*Jul 15 20:23:43.983: %LINK-3-UPDOWN: Interface TenGigabitEthernet0/0/12, changed state to
up
*Jul 15 20:23:45.106: %LINK-3-UPDOWN: Interface TenGigabitEthernet0/0/13, changed state to
up
*Jul 15 20:23:45.367: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/0, changed state to up
*Jul 15 20:23:45.392: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/1, changed state to up
*Jul 15 20:23:45.804: %LINEPROTO-5-UPDOWN: Line protocol on Interface
TenGigabitEthernet0/0/13, changed state to up
*Jul 15 20:23:46.067: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0,
changed state to up
*Jul 15 20:23:46.089: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1,
changed state to up
*Jul 15 20:23:46.736: %LINEPROTO-5-UPDOWN: Line protocol on Interface
TenGigabitEthernet0/0/12, changed state to up
*Jul 15 20:23:46.829: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/4, changed state to up
*Jul 15 20:23:46.837: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/5, changed state to up
*Jul 15 20:23:47.528: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/4,
changed state to up
*Jul 15 20:23:47.537: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/5,
changed state to up
```

During the boot process, observe the system LEDs. After the router has booted, the green STAT LED comes on and stays on.

Verifying the Front Panel LEDs

The front-panel indicator LEDs provide power, activity, and status information useful during bootup. For more detailed information about the LEDs, see the *LED Indicators* section.

Verifying the Hardware Configuration

To display and verify the hardware features, enter the following commands:

- **show version**—Displays the system hardware version, the installed software version, the names and sources of configuration files, the boot images, and the amount of installed DRAM, NVRAM, and flash memory.
- **show diag slot R0 eeprom** —Displays the IDPROM information for the assemblies in the chassis.

Checking Hardware and Software Compatibility

To check the minimum software requirements of Cisco IOS software with the hardware installed on your router, Cisco maintains the Software Research tool on Cisco.com. The tool provides the minimum Cisco IOS-XE requirements for individual hardware modules and components.



Note To access this tool, you must have a Cisco.com login account.

To access the Software Research tool:

1. Go to <http://software.cisco.com/selection/research.html>
2. In the **Search by Product** tab, type *Cisco ASR-920-10SZ-PD Router or Cisco ASR-920-8S4Z-PD*.
3. The Cisco Suggested Release(s) are displayed.

Configuring the Router at Startup

This section explains how to create a basic running configuration for your router.



Note You must acquire the correct network addresses from your system administrator or consult your network plan to determine the correct addresses before you can complete the router configuration.

Before continuing the configuration process, check the current state of the router by entering the **show version** command. This command displays the release of Cisco IOS software that is available on the router.

For information on modifying the configuration after you create it, see the [Cisco IOS configuration and Cisco IOS Master Command List, All Releases guides](#).

To configure a router from the console, you must connect a terminal or terminal server to the console port on the router. To configure the router using the management Ethernet port, you must have the router's IP address.

Accessing the CLI Using the Console

To access the command line interface using the console, follow these steps:

Procedure

Step 1 When your system is booting, type No at the prompt.

```
--- System Configuration Dialog ---  
Would you like to enter the initial configuration dialog? [yes/no]: no
```

Step 2 Press Return to enter the user EXEC mode.

The following prompt is displayed:

```
Router>
```

Step 3 From the user EXEC mode, enter the enable command, as shown in the following example:

```
Router>
```

Step 4 At the password prompt, enter your system password, as shown in the following example. If an enable password has not been set on your system, you can skip this step.

```
Password: enablepass
```

When your password is accepted, the privileged EXEC mode prompt is displayed:

```
Router>
```

You now have access to the CLI in the privileged EXEC mode. You can enter the necessary commands to complete the required tasks.

Step 5 To exit the console session, enter the quit command, as shown in the following example:

```
Router# quit
```

Configuring Global Parameters

When you first start the setup program, configure the global parameters. These parameters are used for controlling system-wide settings. Perform the following steps to enter the global parameters:

Procedure

Step 1 Connect a console terminal to the console port, and then boot the router. For more information on connecting a console terminal, see *Connecting Console Cables* section.

Note The following is only an example of the output display; prompts may vary.

When you see this information, it means that you have successfully booted your router:

Restricted Rights Legend

Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c) of the Commercial Computer Software - Restricted Rights clause at FAR sec. 52.227-19 and subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS sec. 252.227-7013.

cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706

.
.
.

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: **yes**

Press RETURN to get started!

Step 2 The first sections of the configuration script appear only at an initial system startup. On subsequent uses of the setup facility, the script begins with a System Configuration Dialog as shown below: When you are prompted about whether you want to enter the initial configuration dialog, enter **yes**.

Would you like to enter the initial configuration dialog? [yes/no] **yes**

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '['].

Basic management setup configures only enough connectivity for management of the system, extended setup will ask you to configure each interface on the system.

Basic management setup configures enough connectivity for managing the system; extended setup will ask you to configure each interface on the system.

Bringing Up the Management Interface

To bring up the management interface (required for configuring upload or download):

Procedure

- Step 1** Router(conf)# boot ios
- Step 2** Router(conf)# interface gig0
- Step 3** Router(conf)# ip tftp source-interface gig0
- Step 4** Router(config)# ip route vrf mgmt-intf 0.0.0.0 0.0.0.0 <gateway_ip >

Step 5 Router# ping vrf Mgmt-intf <tftp_server_ip >

Checking the Running Configuration Settings

To check the value of the settings you have entered, enter the `show running-config` command at the Router# prompt:

```
Router# show running-config
```

To review the changes you have made to the configuration use the `show startup-config` command in the user EXEC mode to see the changes and copy run-start stored in the NVRAM.

Saving the Running Configuration to NVRAM

To store the configuration or changes to your startup configuration in NVRAM, enter the `copy running-config startup-config` command at the prompt:

```
Router# copy running-config startup-config
```

Using this command saves the configuration settings that you created in the router using the configuration mode and the setup facility. If you fail to do this, your configuration will be lost, and will not be available when you reload the router next.

Safely Powering Off the Router

This section explains how to shut down the router. We recommend that before turning off all power to the chassis, you issue the `reload` command. This ensures that the operating system cleans up all the file systems. After the reload operation is complete, the router can be powered off safely.

To power off the router safely:

Procedure

Step 1 Slip on the ESD-preventive wrist strap included in the accessory kit.

Step 2 Enter the `reload` command.

Step 3 Confirm the reload command.

```
Rmcp-6ru-1#reload
Proceed with reload? [confirm]
Aug 17 00:06:47.051 R0/0: %PMAN-5-EXITACTION: Process manager is exiting: prs exit with
reload chassis code
```

Step 4 After confirming the reload command, wait until the system bootstrap message is displayed before powering off the system:

```
System Bootstrap, Version 15.4(3r)S4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2014 by Cisco Systems, Inc.
```

```
Current image running: Boot ROM0
Last reset cause: RSP-Board
UEA platform with 2097152 Kbytes of main memory
```

Step 5 Remove power cables, if any, from the Cisco ASR-920-10SZ-PD Router:

- For power supplies with a circuit breaker switch, position the switch to the Off (O) position.
- For power supplies with a standby switch, place the standby switch in the Standby position.

Note After powering off the router, wait for a minimum of 30 seconds before powering it on again.



CHAPTER 5

Troubleshooting

This chapter provides information about troubleshooting issues, if any, on the Cisco ASR 920 Series Aggregation Services Router:

- [Pinouts, on page 67](#)

Pinouts

The following sections describe the pinouts for the Cisco ASR 920 Series Router interfaces:

Alarm Port Pinouts

Table below summarizes the external alarm input pinouts.

Table 11: External Alarm Input Pinouts

Pin	Signal Name	Description
1	ALARM0_IN	Alarm input 0
2	ALARM1_IN	Alarm input 1
3	—	No connect
4	ALARM2_IN	Alarm input 2
5	ALARM3_IN	Alarm input 3
6	—	No connect
7	—	No connect
8	COMMON	Alarm common

Management Ethernet Port Pinouts

Table below summarizes the Management Ethernet port pinouts.

Table 12: Fan Alarm Port Pinout

Pin	Signal Name
1	TRP0+
2	TRP0-
3	TRP1+
4	TRP2+
5	TRP2-
6	TRP1-
7	TRP3+
8	TRP3-

USB Console Port Pinouts

Table below summarizes the USB console port pinouts.

Table 13: Single USB Console Port Pinouts

Pin	Signal Name	Description
A1	Vcc	+5VDC
A2	D-	Data -
A3	D+	Data +
A4	Gnd	Ground



Note The USB console port +5VDC is input, and operates as an USB peripheral device.

USB MEM Port Pinouts

Table below summarizes the USB MEM port pinouts.

Table 14: Single USB MEM Port Pinouts

Pin	Signal Name	Description
A1	Vcc	+5VDC (500mA)
A2	D-	Data -

Pin	Signal Name	Description
A3	D+	Data +
A4	Gnd	Ground



Note USB TYPE-A receptacle is used.



Note The USB MEM port +5VDC is output. Cisco ASR 920 Series Aggregation Services Router provides power for USB MEM port. This port operates as a USB host device.

Optical Fiber Specifications

The specification for optical fiber transmission defines two types of fiber: single mode and multimode. Within the single-mode category, three transmission types are defined: short reach, intermediate reach, and long reach. Within the multimode category, only short reach is available. For information about optical SFP modules, see the documentation for the SFP module at:

http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod_installation_guides_list.html .

Alarm Conditions

Table below summarizes the meaning of the alarm conditions on the Cisco ASR 920 Series Router.

Table 15: Alarm Condition Summary

Alarm Type	Alarm Meaning
Critical	Port in down state or only single power supply operational Environmental sensor threshold exceeded critical level (voltage, temperature)
Major	Environmental sensor threshold exceeded major level (voltage, temperature)
Info	Port administratively shut down.



CHAPTER 7

Specifications

- [Environmental Specifications, on page 73](#)

Environmental Specifications

Table 17: Environmental Specifications

Specification	Value
Operating Temperature	-40° C to 65° C Note The temperature range will vary for supported SFP/SFP+ installed on the router. See the corresponding SFP/SFP+ documentation for more details.
Nonoperational temperature	40 to 158°F (-40 to 70°C)
Non-operational temperature (Transportation or Storage, or both)	-40°F (-40°C) for 72 hrs 158°F (70°C) for 72 hrs Section 4.1.1.1 of GR-63 or Section 9.1 of ATIS-0600010.2007 104°F (40°C) and 95% RH for 96 hrs Section 4.1.1.3 of GR-63 or Section 9.3 of ATIS-0600010.2007
Operational humidity	5% to 95%, RH condensing (GR-3108, Class 3)
Non-operational humidity	5% to 95% RH
Non-operational altitude	15000 ft
Operational mechanical shock	Acceleration half sine 50 m/s ² , for 11msec. 100 shocks/surface (EN 300 019-2-4 V2.3.1)
Non-operational mechanical shock	Acceleration half sine 180 m/s ² , for 6msec. 100 shocks/surface. (EN 300 019-2-2 V2.3.1)

Specification	Value
Operational vibration	2.5-200 Hz with spectral break point of 0.1 [(m/s ²) ²]/Hz (0.001 g ² /Hz) at 2.5 - 5 Hz 6 db/octave and 100-200 Hz at -24 db/octave. (EN 300 019-2-4 V2.3.1)
Non-operational vibration	5-200 Hz with spectral break point of 1.0 [(m/s ²) ²]/Hz (0.01 g ² /Hz) at 5 - 100 Hz -6 db/octave and 20-200 Hz at -24 db/octave. (EN 300 019-2-2 V2.3.1)
Cold start	-40°F (-40°C)
Hot start	149°F (65° C)
Non-operational Free-Fall Drop	Drop the unpackaged sample 3.9" onto a rigid surface. Drop 1 face, 2 edges, and 2 corners. (ENG-339611.Rev2 [Test Method: IEC-68-2-32])
Earthquake, Zone 4	Equipment complies with earthquake tests per sections 4.4.1 and 5.4.1 of GR-63 or ANSI TI-329 (GR-3108 Class 3)



CHAPTER 8

Supported SFPs and PIDs

- [Supported SFPs, on page 75](#)
- [Supported PIDs, on page 76](#)

Supported SFPs

- GLC-LH-SMD
- GLC-SX-MMD
- GLC-SX-MM-RGD
- GLC-EX-SMD
- GLC-ZX-SM-RGD
- CWDM-SFP-xxxx (8 colors)
- GLC-BX-U
- GLC-BX-D
- GLC-LX-SM-RGD
- SFP-GE-L
- SFP-GE-S
- SFP-GE-Z
- SFP-GE-T
- DWDM-SFP-xxxx (40 wavelengths)
- SFP-10G-SR
- SFP-10G-LR
- SFP-10G-ER
- SFP-10G-ZR
- SFP-10G-SR-X
- SFP-10G-LR-X
- GLC-FE-100FX
- GLC-FE-100FX-RGD
- GLC-FE-100EX
- GLC-FE-100ZX
- GLC-FE-100LX
- GLC-FE-100LX-RGD
- GLC-FE-100BX-U
- GLC-FE-100BX-D

Supported PIDs

PID	Description
ASR920-S-M=	ASR 920 Metro Access Services Paper PAK
ASR920-S-I=	ASR 920 Metro IP Access Services Paper PAK
ASR920-S-A=	ASR 920 Advanced Metro IP Access Services Paper PAK
ASR920-1588	ASR 920 IEEE 1588-2008 BC/MC License Paper PAK
ASR920-1588=	ASR 920 IEEE 1588-2008 BC/MC License Paper PAK
ASR920-1G-6=	Cisco ASR920 Series - 6 ports GE license Paper PAK
ASR920-10G-2=	Cisco ASR920 Series - 2 ports 10GE license Paper PAK
ASR920-10G-2-10G	Cisco ASR920 Series - 10 ports 1GE and 2 ports 10GE license
ASR920-S-I-A=	ASR 920 Metro IP to Advanced Metro IP Access Paper PAK
ASR920-S-M-I=	ASR 920 Metro Access to Metro IP Access Paper PAK
ASR920-S-M-A=	ASR 920 Metro Access to Advanced Metro IP Access Paper PAK
L-ASR920-S-M=	ASR 920 Metro Access Services E-Delivery PAK
L-ASR920-S-I=	ASR 920 Metro IP Access Services E-Delivery PAK
L-ASR920-S-A=	ASR 920 Advanced Metro IP Access Services E-Delivery PAK
L-ASR920-1588=	ASR 920 IEEE 1588-2008 BC/MC License E-Delivery PAK
L-ASR920-S-M-A=	ASR 920 Metro Access to Adv Metro IP Access E-Delivery PAK
L-ASR920-S-I-A=	ASR 920 Metro IP to Advanced Metro IP Access E-Delivery PAK
L-ASR920-S-M-I=	ASR 920 Metro Access to Metro IP Access E-Delivery PAK
L-ASR920-1G-6=	Cisco ASR920 Series - 6 ports GE license E-Delivery PAK
L-ASR920-10G-2=	Cisco ASR920 Series - 2 ports 10GE license E-Delivery PAK

Table 18: Supported PIDs—Default Accessory Kit

PID	Description
A900-CONS-KIT-U	USB Console Kit
A920-CONS-KIT-S	Serial Console Kit
A920-RCKMT-19-PC	EIA19-inch rack mount for ASR-920-10SZ-PD

PID	Description
A920-CBL-GUIDE-PC	ASR 920 Cable Guide for passively cooled variant
A920-PC-CAB-DC-3M	Power Cord–DC, ASR 920 Passively Cooled–3M

