



Preparing to Install the Router

This chapter describes site requirements and equipment used to install the Cisco ASR 901 router. It includes the following sections:

- [Safety Guidelines, page 2-1](#)
- [Prerequisites, page 2-4](#)
- [Site Planning, page 2-4](#)
- [Console Port Considerations, page 2-8](#)

Safety Guidelines

Before you begin installing the Cisco ASR 901 router, review the safety guidelines in [Safety Precautions, page 1-5](#), and the [Rack-Mounting Configuration Guidelines, page 3-2](#) to avoid injuries or damaging the equipment.

In addition, before replacing, configuring, or maintaining the Cisco ASR 901 router, review the safety warnings listed in the document [Cisco Regulatory Compliance and Safety Information for Cisco ASR 901 Series Aggregation Services Router](#).

Safety with Equipment

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



Warning

Before connecting the system to the power source, read the installation instructions. Statement 1004

- 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 clean and dust-free.
- Keep tools and assembly components away from walk areas to avoid tripping over them.
- Do not work alone in potentially hazardous conditions.
- 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 hazardous to your eyes, wear safety glasses.

Safety with Electricity



Warning

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



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

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 RJ-45 connectors. Statement 1021



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

Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units. Statement 12



Warning

During periods of lightning activity, do not work on the system or connect or disconnect cables. Statement 1001



Warning

There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. Statement 1015



Warning

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

When working on electrical equipment, follow these guidelines:

- Locate the room's emergency power switch. If an electrical accident occurs, you can quickly switch off the power.
- Before working on the system, switch off the DC main circuit breaker and disconnect the power terminal block cable.
- Disconnect all power before performing the following:

- 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 wet 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.
 - Switch 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.

In addition, use the following guidelines when working with any equipment that is disconnected from a power source, but still connected to telephone wiring or network cabling:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for it.
- Never touch un-insulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- When installing or modifying telephone lines, use caution.

Preventing Electrostatic Discharge Damage

Electrostatic Discharge (ESD) can damage equipment and impair electrical circuitry. ESD can 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.



Caution

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

Prerequisites

Before installing the Cisco ASR 901 router, it is important to prepare for installation by:

- Preparing the site (site planning) and reviewing the installation plans or method of procedures (MOPs).
- Unpacking and inspecting the Cisco ASR 901 router.
- Gathering tools and test equipment required to properly install the Cisco ASR 901 router.

Site Planning

Ideally, you should have prepared the installation site beforehand. As part of your preparation, obtain a floor plan of the site and the equipment rack where the Cisco ASR 901 router would be housed.

Determine the location of any existing routers and their interconnections, including communications and power. Following the air flow guidelines (see the [“Air Flow Guidelines” section on page 2-5](#)), ensure that adequate cooling air is provided to the router.

All personnel involved in the installation of the router including installers, engineers, and supervisors should participate in the preparation of a Method of Procedure (MOP) for approval by the customer.

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 (see the [Power Supply, page 1-5](#) for power requirements).



Warning

This equipment is designed for connection to TN and IT power systems. Statement 16

Site Environment

Install the Cisco ASR 901 router in an equipment rack. The location of your router and the layout of your equipment rack, or wiring room are extremely important considerations for proper operation. Cramped equipment, inadequate ventilation, and inaccessible panels can cause malfunctions and shutdown, and can make maintenance difficult. Plan to access the front and rear panels of the router.

Take the following precautions for an acceptable operating environment for your router and to avoid environmentally caused equipment failures:

- Ensure that the room where your router operates has adequate air circulation. Electrical equipment generates heat. Without adequate circulation, ambient air temperature may not cool the equipment to acceptable operating temperatures.
- Always follow ESD-prevention procedures described in the [“Preventing Electrostatic Discharge Damage” section on page 2-3](#) to avoid damage to equipment.
- The router should be placed inside a space protected from direct outside weather and environmental stress by an enclosure, where the operating climate (as defined by Class 2 of GR-3108-CORE) is between:
 - -40 to +149°F (-40°C to +65°C)
 - 5% to 85% RH

**Note**

For an outside plant installation (cell site cabinet, hut etc.), it is required that the router be protected against airborne contaminants, dust, moisture, insects, pests, corrosive gases, polluted air or other reactive elements present in the outside air. To achieve this level of protection, it is recommended that the unit be installed in a fully sealed (i.e. Closed Loop) enclosure. Examples of such cabinets include IP65 cabinets with heat exchanger, complying with Telecordia GR487

Air Flow Guidelines

To ensure adequate air flow through the equipment rack, we recommend that you maintain a clearance of at least 6 inches (15.24 cm) on each side of the rack at all times.

**Caution**

If air flow through the equipment rack and the routers that occupy it is blocked or restricted, or if the ambient air being drawn into the rack is too warm, an over temperature condition can occur within the rack and the routers that occupy it.

The site should also be as dust-free as possible. Dust tends to clog the router fans, reducing the flow of cooling air through the equipment rack and the routers. Thus, increasing the risk of an over temperature condition.

Use the following guidelines to plan your equipment rack configuration:

- Mount the Cisco ASR 901 router in a 19-inch rack (with a 17.5- or 17.75-inch opening).
- Beside air flow, you must allow clearance around the rack for maintenance.
- Enclosed racks must have adequate ventilation. Ensure that the rack is not congested, because each router generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air. Heat that is generated by equipment near the bottom of the rack can be drawn upward into the intake ports of the equipment above.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the intakes or (on the left side of the chassis) or the exhaust (on the right side of the chassis).
- When a rack-installed equipment fails, especially equipment in an enclosed rack, try making the equipment operate by itself, if possible. Power off other equipment in the rack (and in adjacent racks) to give the router a maximum of cooling air and clean power.

Method of Procedure

Part of site preparation includes reviewing installation plans or method of procedures (MOPs). An example of a MOP that includes pre-installation checklist of tasks, considerations to address and agree upon before proceeding with the installation, is as follows:

1. Read this hardware installation guide.
2. Assign personnel.
3. Determine protection requirements for personnel, equipment, and tools.
4. Evaluate potential hazards that may affect service.
5. Schedule time for installation.
6. Determine space requirements.

7. Determine power requirements.
8. Identify required procedures or tests.
9. On an equipment plan, make a preliminary decision that locates each Cisco ASR 901 router that you plan to install.
10. Verify the list of replaceable parts for installation (screws, bolts, washers, and so on) so that the parts are identified.
11. Check the required tools list to make sure the necessary tools and test equipment are available (see the “Required Tools and Equipment” section on page 2-7).
12. Perform the installation.

Unpacking and Checking the Contents of your Shipment

The shipping package for the Cisco ASR 901 router is designed to reduce the possibility of product damage associated with routine handling experienced during shipment. Do not remove the router from its shipping container until you are ready to install it.



Note

Do not discard the packaging materials used in shipping your Cisco ASR 901 router. You will need the packaging materials in the future if you move or ship the router.

The Cisco ASR 901 router, cables, and any optional equipment you ordered may be shipped in more than one container. When you unpack the containers, check the packing list to ensure that you receive all of the following items:

- Router
- Accessory kit (part number 53-3085-01/53-3295-0 for the Cisco ASR 901), containing
 - Terminal block (part number 53-3085-01)
 - Two hole lug, 6-AWG ground wire, #10 blue stud (part number 32-0629-01)
 - Two pan-head Phillips screws used to attach the lug to the router, M5.0x10mm
 - Two cable guides (part number 700-01663-01)
 - Two pan-head Phillips screws used to attach the cable guides, M4,0x20mm (part number 48-0654-01)



Note

There is no AC power option.

- *Cisco Information Packet* publication

Inspect all items for shipping damage. If an item appears to be damaged, or if you encounter problems installing or configuring your router, contact customer service. The *Cisco Information Packet* provides warranty, service, and support information.

Required Tools and Equipment

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



Warning

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

Statement 49

- ESD-preventive cord and wrist strap.
- Number 2 Phillips screwdriver.
- Flat-blade screwdrivers: small, 3/16-inch (0.476 cm) and medium, 1/4-inch (0.625 cm).
 - To install or remove modules
 - To remove the cover, if you are upgrading memory or other components
- Number 12-24 pan-head screws to secure the router to the equipment rack.
- Cables for connection to the WAN and LAN ports (depending on the configuration).



Note For more information on cable specifications, see [Appendix B, “Cable Specifications”](#)

- Ethernet hub or PC with a network interface card for connection to the Ethernet (LAN) ports.
- Console terminal (an ASCII terminal or a PC running terminal emulation software) is configured for 9600 baud, 8 data bits, no parity, and 2 stop bits.
- Console cable for connection to the console port.
- Ratcheting torque screwdriver with a Phillips head that exerts up to 15 pound-force inches (lbf-in) of pressure.
- Crimping tool as specified by the ground lug manufacturer.
- 16-AWG copper wire for the power cord.
- Wire-stripping tools for stripping both 6-AWG and 18-AWG wire.
- Serial interfaces may require a channel service unit/data service unit (CSU/DSU).

Installation Checklist

To assist you with your installation and to provide a historical record of completed tasks and users, use the following Installation Checklist. Make a copy of this checklist and mark the entries as you complete each task. When the checklist is completed, include a copy of the checklist for each router in your Site Log along with other records for your new router. See [Appendix C, “Site Log”](#) for information on the Site Log, including a sample Site Log.

Installation Checklist for Site:

Router Name:

Task	Verified by	Date
Installation Checklist copied		
Background information placed in Site Log		

Task	Verified by	Date
Site power voltages verified		
Installation site power check completed		
Required tools available		
Additional equipment available		
Router received		
Documentation DVD received (if ordered)		
<i>Cisco Information Packet</i> publication received		
Chassis components verified		
Initial electrical connections established		
ASCII terminal (for local configuration) or modem (for remote configuration)		
Signal distance limits verified		
Startup sequence steps completed		
Initial operation verified		
Software image verified		

Creating a Site Log

The site log provides a record of all 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 installation. (See [Appendix C, “Site Log”](#) for more detailed information on the site log as well as a sample site log that can be used to make copies.)

Console Port Considerations

The Cisco ASR 901 router provides a single console port (labeled CONSOLE). A single RJ-45 cable is used for a console connection.

This section describes important cabling information to consider before connecting a console terminal—either an ASCII terminal or a PC running terminal emulation software—or a modem to the console port. The console port provides access to the router either locally (using a console terminal), or remotely (using a modem).



Note

The Cisco ASR 901 router uses only console port.



Note

Console and rollover cables are not included with the Cisco ASR 901 router. You can order the console cable from Cisco Systems, Inc. (Part number ACS-1900ASYN=).

Console Port Connections

The router provides an EIA/TIA-232 asynchronous serial console port (RJ-45). Depending on the cable and the adapter used, this port appears as a data terminal equipment (DTE) or data communications equipment (DCE) device at the end of the cable.

To connect an ASCII terminal to the console port, use the RJ-45 rollover cable with the female RJ-45-to-DB-25 adapter (labeled TERMINAL). To connect a PC running terminal emulation software to the console port, use the RJ-45 rollover cable with the female RJ-45-to-DB-9 adapter (labeled TERMINAL). The default parameters for the port are 9600 baud, 8 data bits, no parity, and 2 stop bits. As a console port, hardware flow control is not supported. For instructions on installing a console terminal, see the [“Connecting the Console Port” section on page 3-11](#).

For cable and port pinouts, see the online document *Cisco Modular Access Router Cable Specifications*. This document is provided on the documentation DVD that accompanied your router (if ordered), and is also available online at Cisco.com.

