



## Planning Your Installation

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This chapter provides preinstallation information, such as recommendations and requirements that must be met before installing your Cisco VG450 Voice Gateway. See the following sections to prepare for installation:

- [Location and Mounting Requirements, on page 1](#)
- [Network Cabling Considerations, on page 3](#)
- [Distance Limitations for Interface Cables, on page 4](#)
- [Interference Considerations, on page 4](#)
- [Required tools and equipment for installation, on page 5](#)
- [Site Log, on page 5](#)
- [Installation Checklist, on page 6](#)

## Location and Mounting Requirements

The mounting possibilities for your Cisco VG450 Voice Gateway are:

- Rack-mount
- Bench-top

The mounting location must provide the following:

## Temperature Control and Ventilation

The installation location (room, closet, or cabinet) for the Cisco VG450 Voice Gateway should always be well ventilated and provide adequate air circulation to ensure proper cooling. The room temperature should be maintained between 32 to 122°F (0 to 50°C).



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**Note** The Cisco VG450 Voice Gateway chassis is designed for back and sides-to-front airflow.

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## Enclosed Racks



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**Caution** Enclosed racks must have adequate ventilation. An enclosed rack should never be overcrowded and should have louvers and a fan.

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If the Cisco VG450 Voice Gateway is installed in an enclosed rack with a ventilation fan at the top, make sure that heated air drawn upward from other equipment does not prevent adequate cooling.

If the chassis is installed using slide rails, check for blocked ventilation ports when it is in position in the rack or cabinet. Make sure that the ventilation ports of the Cisco VG450 Voice Gateway are not blocked.




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**Tip** Baffles can help isolate exhaust air from intake air. Baffles also help draw cooling air through the cabinet. The best location for the baffles depends on the airflow patterns in the rack. You can test the airflow by experimenting with different equipment arrangements.

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## Bench-Mounted

If the unit is placed on a bench-top, do not stack other equipment or paper on the chassis. Provide plenty of space for air circulation (front to back). Inadequate ventilation can result in overheating and damage.

## Rack requirements

The following information can help you plan your equipment rack configuration:

- Allow clearance around the rack for maintenance.
- Enclosed racks must have adequate ventilation. Ensure that the rack is not congested, because the hardware generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air. Heat generated by equipment at the bottom of the rack can be drawn upward into the intake ports of the equipment above it.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the intake or exhaust ports. If the chassis is installed on slides, check the position of the chassis when it is seated in the rack.

If the Cisco VG400 Voice Gateway is installed in an enclosed rack with a ventilation fan at the top, make sure that heated air drawn upward from other equipment does not prevent adequate cooling.




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**Note** Enclosed racks must have adequate ventilation. An enclosed rack should never be overcrowded and should have louvers and a fan

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If the chassis is installed using slide rails, check for blocked ventilation ports when it is in position in the rack or cabinet. Make sure that the ventilation ports of the Cisco VG450 Voice Gateway are not blocked.

Baffles can help isolate exhaust air from intake air. Baffles also help draw cooling air through the cabinet. The best location for the baffles depends on the airflow patterns in the rack. You can test the airflow by experimenting with different equipment arrangements.

## Access to Chassis

Allow space at the rear of the chassis for cable connections. Also consider the need to access the chassis for future upgrades, maintenance, and troubleshooting.

Chassis grounding is provided through the power cable, which uses a standard grounding plug. However, the chassis also requires a reliable earth ground using the earth ground lug and hardware provided. For more information, see the *Chassis Grounding* section.

## Power Source

A Cisco VG450 Voice Gateway with AC power supply autoselects either 100–127 volt or 200–240 volt operation. AC versions include a 6-foot (1.8-meter) electrical power cord. (A label near the power cord indicates the correct voltage, frequency, current draw, and power dissipation.)

### Power Supply Considerations

Cisco VG450 Voice Gateway requires significantly more power because of its high-density ports and OPX ‘Lite’ requirements.

This require a larger 48V battery backup that may need to be custom built.

To handle power failure conditions, an uninterruptured power supply (UPS) is needed. UPS is widely available in all markets, including emerging markets (due to prevalence of UPS for personal computers). Thus, a separate UPS for Cisco VG450 Voice Gateway is a viable option when the ISR/UPS is not co-located with it.

If you suspect that your AC power is not clean—if lights flicker often or there is machinery with large motors nearby—have a qualified person test the power. Install a power conditioner if necessary.




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**Warning** Avoid using or servicing any equipment that has outdoor connections during an electrical storm. There may be a risk of electric shock from lightning. Statement 1088

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**Warning** Read the installation instructions before you connect the system to its power source. Statement 1004

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**Warning** This product relies on the building’s installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 120 VAC, 15A U.S. (240 VAC, 10A international) Statement 1005

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**Warning** The device is designed for connection to TN and IT power systems. Statement 1007

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**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 by security. Statement 1017

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## Network Cabling Considerations

The cable types that are used are dependent on the Cisco VG450 Voice Gateway that you are using. For more information, see the [“Cable Specifications and Information” section on page A-1](#) .

The following are the cable types that are used in the Cisco VG450 Voice Gateway:

- GE cables (RJ-45 to RJ-45 straight-through cables)
- Analog voice cables (RJ-21)

## Distance Limitations for Interface Cables

When planning your installation, consider distance limitations and potential electromagnetic interference (EMI) as defined by the Electronic Industries Association (EIA). Distance limitation information is included for the following VG ports:

- Gigabit Ethernet Maximum Distance: The maximum segment distance for Gigabit Ethernet is 330 feet (100 meters) (specified in IEEE 802.3).
- FXS Analog Voice Port Maximum Distance: The maximum distance is established by a total allowable loop resistance, including the phone or terminal equipment, of 600 ohms.
- FXS-E (Extended loop) Analog Voice Port Maximum Distance: The maximum distance is established by a total allowable loop resistance, including the phone or terminal equipment, of 1400 ohms.



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**Note** Typically, a 26 AWG wire is equal to 81.6 ohm/Kft and 24 AWG wire is equal to 51.3 ohm/Kft.

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## Interference Considerations

When you run cables for any significant distance in an electromagnetic field, interference can occur between the electromagnetic field and the signals on the cables. This has two implications for the installation of terminal plant cabling:

- Unshielded plant cabling can emit radio interference.
- Strong electromagnetic interference (EMI), especially as caused by lightning or radio transmitters, can destroy the EIA/TIA-232 drivers and receivers in the Cisco VG450 Voice Gateway.

If you use twisted-pair cables with a good distribution of grounding conductors in your plant cabling, emitted radio interference is unlikely.

If you have cables exceeding recommended distances, or if you have cables that pass between buildings, give special consideration to the effect of lightning strikes or ground loops. If your site has these characteristics, consult experts in lightning suppression and shielding. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic devices.

Most data centers cannot resolve such infrequent, but potentially catastrophic problems without pulse meters and other special equipment. Take precautions to avoid these problems by providing a properly grounded and shielded environment and by installing electrical surge suppression.

If you remove any module, you must either install a module in its place or install a cover plate over the opening. All module openings must be either occupied or covered to prevent electromagnetic interference.

For advice on the prevention of electromagnetic interference, consult experts in radio-frequency interference (RFI).

# Required tools and equipment for installation

**Warning**

Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

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

- Standard flat-blade screwdriver as required for attaching the brackets, as per your mounting.
- Phillips screwdriver for attaching the brackets to the Voice Gateway.
- Mounting brackets and screws for the 24-inch rack, if required.
- Four telco machine screws, for installing the chassis in a rack (use the screw size required by the rack).
- Screws and anchors for wall-mounting (if applicable):
  - Eight wood screws or other fasteners, for installing the chassis on a wall.
  - An additional starter screw can be used to facilitate wall-mounting.
- An ESD-preventive wrist strap
- In addition, you might also need the following external equipment:
  - A Console terminal or PC with terminal emulation software
  - A PC running terminal emulation software for administrative access
  - Modem for remote access.
  - Analog voice RJ-11 cables
  - Ethernet switch
- A modem for remote configuration.

## Site Log

We recommend that you maintain a Site Log to record all actions relevant to the system. Site Log entries might include the following:

- Installation—Print a copy of the Installation Checklist and insert it into the Site Log.
- Upgrades and maintenance—Use the Site Log to record ongoing maintenance and expansion history. Update the Site Log to reflect the following:
  - Configuration changes
  - Maintenance schedules, requirements, and procedures performed
  - Comments, notes, and problems
  - Changes and updates to Cisco IOS software

# Installation Checklist

The following Installation Checklist lists the tasks for installing a Cisco VG450 Voice Gateway. Print a copy of this checklist and mark the entries as you complete each task. For each Cisco VG450 Voice Gateway, include a copy of the checklist in your Site Log. (Installation Checklist image)

**Installation Checklist for site** \_\_\_\_\_

**Cisco VG name/serial number** \_\_\_\_\_

Task	Verified by	Date
Background information placed in Site Log		
Environmental specifications verified		
Site power voltages verified		
Installation site prepower check completed		
Required tools available		
Additional equipment available		
Cisco VG received		
Quick start guide received		
Regulatory compliance and safety information received		
Information packet, warranty card, and Cisco.com card received		
Software version verified		
Rack, or desktop mounting of chassis completed		
Initial electrical connections established		
ASCII terminal attached to console port		
Modem attached to console port (for remote configuration)		
Signal distance limits verified		
Startup sequence steps completed		
Initial operation verified		