



# **Deploying and Upgrading Avaya G450 Branch Gateway**

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## Preventing Toll Fraud

"Toll Fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf). Be aware that there can be a risk of Toll Fraud associated with your system and that, if Toll Fraud occurs, it can result in substantial additional charges for your telecommunications services.

## Avaya Toll Fraud intervention

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## Virtualization

The following applies if the product is deployed on a virtual machine. Each product has its own ordering code and license types. Unless otherwise stated, each Instance of a product must be separately licensed and ordered. For example, if the end user customer or Avaya Channel Partner would like to install two Instances of the same type of products, then two products of that type must be ordered.

## How to Get Help

For additional support telephone numbers, go to the Avaya Support website: <http://www.avaya.com/support>. If you are:

- Within the United States, click the Escalation Contacts link that is located under the Support Tools heading. Then click the appropriate link for the type of support that you need.
- Outside the United States, click the Escalation Contacts link that is located under the Support Tools heading. Then click the International Services link that includes telephone numbers for the international Centers of Excellence.

## Providing Telecommunications Security

Telecommunications security (of voice, data, and/or video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of) your company's telecommunications equipment by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions may be either to/through synchronous (time-multiplexed and/or circuit-based), or asynchronous (character-, message-, or packet-based) equipment, or interfaces for reasons of:

- Utilization (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

## Responsibility for Your Company's Telecommunications Security

The final responsibility for securing both this system and its networked equipment rests with you - Avaya's customer system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources including but not limited to:

- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure:

- Your Avaya-provided telecommunications systems and their interfaces
- Your Avaya-provided software applications, as well as their underlying hardware/software platforms and interfaces
- Any other equipment networked to your Avaya products

#### **TCP/IP Facilities**

Customers may experience differences in product performance, reliability and security depending upon network configurations/design and topologies, even when the product performs as warranted.

#### **Product Safety Standards**

This product complies with and conforms to the following international Product Safety standards as applicable:

- IEC 62368-1 latest edition, including all relevant national deviations as listed in the IECEE Bulletin—Product Category OFF: IT and Office Equipment.
- CAN/CSA-C22.2 No. 62368-1 / UL 62368-1 latest edition.

This product may contain Class 1 laser devices.

- Class 1 Laser Product
- Luokan 1 Laserlaitte
- Klass 1 Laser Apparat

#### **Electromagnetic Compatibility (EMC)**

Avaya LLC is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Avaya LLC. The correction of interference caused by such unauthorized modifications, substitution or attachment will be the responsibility of the user. Pursuant to Part 15 of the Federal Communications Commission (FCC) Rules, the user is cautioned that changes or modifications not expressly approved by Avaya LLC, could void the user's authority to operate this equipment.

#### **Federal Communications Commission Part 15 Statement:**

For a Class A digital device or peripheral:

##### **Note:**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

For a Class B digital device or peripheral:

##### **Note:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to

try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### **Equipment With Direct Inward Dialing ("DID"):**

Allowing this equipment to be operated in such a manner as to not provide proper answer supervision is a violation of Part 68 of the FCC's rules.

Proper Answer Supervision is when:

1. This equipment returns answer supervision to the public switched telephone network (PSTN) when DID calls are:
  - answered by the called station,
  - answered by the attendant,
  - routed to a recorded announcement that can be administered by the customer premises equipment (CPE) user
  - routed to a dial prompt
2. This equipment returns answer supervision signals on all (DID) calls forwarded back to the PSTN.

Permissible exceptions are:

- A call is unanswered
- A busy tone is received
- A reorder tone is received

Avaya attests that this registered equipment is capable of providing users access to interstate providers of operator services through the use of access codes. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.

#### **Automatic Dialers:**

When programming emergency numbers and (or) making test calls to emergency numbers:

- Remain on the line and briefly explain to the dispatcher the reason for the call.
- Perform such activities in the off-peak hours, such as early morning or late evenings.

#### **Toll Restriction and least Cost Routing Equipment:**

The software contained in this equipment to allow user access to the network must be upgraded to recognize newly established network area codes and exchange codes as they are placed into service.

Failure to upgrade the premises systems or peripheral equipment to recognize the new codes as they are established will restrict the customer and the customer's employees from gaining access to the network and to these codes.

#### **For equipment approved prior to July 23, 2001:**

This equipment complies with Part 68 of the FCC rules. On either the rear or inside the front cover of this equipment is a label that contains, among other information, the FCC registration number, and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

#### **For equipment approved after July 23, 2001:**

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the Administrative Council on Terminal Attachments (ACTA). On the rear of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXX. If requested, this number must be provided to the telephone company.

The REN is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed 5.0.

L'indice d'équivalence de la sonnerie (IES) sert à indiquer le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas cinq.

To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXX. The digits represented by ## are the REN without a decimal point (for example, 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

#### Means of Connection:

Connection of this equipment to the telephone network is shown in the following table:

| Manufacturer's Port Identifier | FIC Code   | SOC/ REN/ A.S. Code | Network Jacks       |
|--------------------------------|------------|---------------------|---------------------|
| Off premises station           | OL13C      | 9.0F                | RJ2GX, RJ21X, RJ11C |
| DID trunk                      | 02RV2.T    | AS.2                | RJ2GX, RJ21X, RJ11C |
| CO trunk                       | 02GS2      | 0.3A                | RJ21X, RJ11C        |
|                                | 02LS2      | 0.3A                | RJ21X, RJ11C        |
| Tie trunk                      | TL31M      | 9.0F                | RJ2GX               |
| Basic Rate Interface           | 02IS5      | 6.0F, 6.0Y          | RJ49C               |
| 1.544 digital interface        | 04DU9.BN   | 6.0F                | RJ48C, RJ48M        |
|                                | 04DU9.1K N | 6.0F                | RJ48C, RJ48M        |
|                                | 04DU9.1S N | 6.0F                | RJ48C, RJ48M        |
| 120A4 channel service unit     | 04DU9.DN   | 6.0Y                | RJ48C               |

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact the Technical Service Center at 1-800-242- 2121 or contact your local Avaya representative. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 5 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is

designed to be connected to a compatible modular jack that is also compliant.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

#### Installation and Repairs

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. It is recommended that repairs be performed by Avaya certified technicians.

#### FCC Part 68 Supplier's Declarations of Conformity

Avaya LLC in the United States of America hereby certifies that the equipment described in this document and bearing a TIA TSB-168 label identification number complies with the FCC's Rules and Regulations 47 CFR Part 68, and the Administrative Council on Terminal Attachments (ACTA) adopted technical criteria.

Avaya further asserts that Avaya handset-equipped terminal equipment described in this document complies with Paragraph 68.316 of the FCC Rules and Regulations defining Hearing Aid Compatibility and is deemed compatible with hearing aids.

Copies of SDoCs signed by the Responsible Party in the U. S. can be obtained by contacting your local sales representative and are available by contacting Avaya Support website at: <https://support.avaya.com>.

#### Canadian Conformity Information

This Class A (or B) digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A (ou B) est conforme à la norme NMB-003 du Canada.

This product meets the applicable Industry Canada technical specifications/Le présent matériel est conforme aux spécifications techniques applicables d'Industrie Canada.

#### European Union Declarations of Conformity



This device when installed complies with the essential requirements and other relevant provisions of the EMC Directive 2014/30/EU, and Safety LV Directive 2014/35/EU.

A copy of the Declaration may be obtained from <https://support.avaya.com> or Avaya LLC, 350 Mt. Kemble Avenue, Morristown, NJ USA 07960 USA.

#### European Union Battery Directive



Avaya LLC supports European Union Battery Directive 2006/66/EC. Certain Avaya LLC products contain lithium batteries. These batteries are not customer or field replaceable parts. Do not disassemble. Batteries may pose a hazard if mishandled.

#### Japan

The power cord set included in the shipment or associated with the product is meant to be used with the said product only. Do not use the cord set for any other purpose. Any non-recommended usage

could lead to hazardous incidents like fire disaster, electric shock, and faulty operation.

本製品に同梱または付属している電源コードセットは、本製品専用です。本製品以外の製品ならびに他の用途で使用しないでください。火災、感電、故障の原因となります。

**If this is a Class A device:**

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

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**If this is a Class B device:**

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

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# Chapter 1: Introduction

---

## Purpose

This document contains Branch Gateway installation, configuration, upgrading, basic maintenance checklist, and procedures.

This document is intended for system administrators, implementation, and support personnel.

## Change history

| Issue | Release Date  | Summary of changes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2     | February 2026 | <p>Updated the following section:</p> <ul style="list-style-type: none"> <li>• <a href="#">Branch Gateway backups and restores</a> on page 104</li> </ul> <p>Added the following sections:</p> <ul style="list-style-type: none"> <li>• <a href="#">Replacing the G450 main board</a> on page 67.</li> <li>• <a href="#">Best practices for backup</a> on page 104.</li> <li>• <a href="#">Backup and restore operations</a> on page 105.</li> <li>• <a href="#">Backing up G450 gateway</a> on page 105.</li> <li>• <a href="#">Restoring a gateway backup</a> on page 106.</li> <li>• <a href="#">Preserving SNMP engine ID</a> on page 108.</li> <li>• <a href="#">Backup and restore for G450 motherboard replacement</a> on page 108.</li> <li>• <a href="#">Backing up and restoring for non-FIPS mode gateways</a> on page 108.</li> <li>• <a href="#">Backing up and restoring for FIPS mode gateways</a> on page 110.</li> <li>• <a href="#">Backing up and restoring for gateway replacement</a> on page 111.</li> <li>• <a href="#">Non-FIPS mode gateway motherboard replacement checklist</a> on page 112.</li> <li>• <a href="#">FIPS mode gateway motherboard replacement checklist</a> on page 113.</li> <li>• <a href="#">Post restoration of gateway checks</a> on page 114.</li> </ul> |
| 1     | December 2023 | Release 10.2.x document.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

# Chapter 2: Planning and pre-configuration

---

## Installation equipment

Ensure you have the following equipment before installing Branch Gateway:

- One loop start analog trunk for connecting a laptop for configuration.
- A separate phone line for communication during remote configuration.

---

## Mounting equipment

Ensure you have the following equipment before mounting Branch Gateway:

- A crosspoint screwdriver for rack mounting or wall mounting.
- For mounting on a flat wall, screws to fasten Branch Gateway to the wall.
- For mounting on a non-flat wall:
  - A 48 in. x 48 in. (1.2 m x 1.2 m) plywood board (US 3/4 in. plywood), 0.75 in. (20 mm) thick.
  - Wood screws to fasten Branch Gateway to the plywood board.
  - Screws to fasten the plywood board to the wall (10-12 pan head screws of at least 3/4 in.).

---

## Installation hardware

If you install an S8300 server, ensure that you have the following hardware:

- One USB CD/DVD-ROM drive (Avaya Comcode 700406267).
- A laptop computer with Internet Explorer.

If you do not install an S8300 server, ensure that you have the following hardware:

- A PC on the local network.
- Optional USB flash drive.
- A laptop running a supported version of Windows, a USB port for a USB Serial adaptor cable, and a RJ45 cable. If using the serial port, the port being used will appear under a list in Device Manager on your laptop.

## Related links

[USB modems supported by the Branch Gateway](#) on page 134

---

# Obtaining the Branch Gateway serial number

## About this task

You need to obtain the Branch Gateway serial number to add the Gateway in Communication Manager. The serial number can be found by running the **show system** command.

## Procedure

View the serial number label on the back of the Branch Gateway chassis.

---

# Downloading software from PLDS

## Procedure

1. On your web browser, type <http://plds.avaya.com> to access the Avaya PLDS website.
2. Enter your login ID and password.
3. On the PLDS Home page, select **Assets**.
4. Click **View Downloads**.
5. Click the search icon  for Company Name.
6. In the Search Companies dialog box, do the following:
  - a. In the **%Name** field, type *Avaya* or the Partner company name.
  - b. Click **Search Companies**.
  - c. Locate the correct entry and click the **Select** link.
7. Search for the available downloads by using one of the following:
  - In **Download Pub ID**, type the download pub ID.
  - In the **Application** field, click the application name.
8. Click **Search Downloads**.
9. In the **Download Manager** box, click the appropriate **Download** link.

### **Note:**

The first link, **Click to download your file now**, uses the Download Manager to download the file. The Download Manager provides features to manage the download

(stop, resume, auto checksum). The **click here** link uses your standard browser download and does not provide the download integrity features.

10. If you use the Download Manager, click **Details** to view the download progress.
11. Select a location where you want to save the file, and click **Save**.
12. **(Optional)** When the system displays the security warning, click **Install**.

When the installation is complete, PLDS displays the downloads again with a check mark next to the downloads that have completed successfully.

---

## License file with Survivable Remote Server

If you are installing an S8300 server as a Survivable Remote Server (SRS), the license file for S8300 must have Communication Manager release that is equal to or later than that of the server that acts as a primary controller. In this case, if control passes to the SRS, it can have the same level of call processing as the primary controller.

The SRS must have a version of Avaya Aura® Communication Manager, which is the same as the primary controller version.

The license file requirements of the SRS should be identified in your planning documentation.

---

## Assigning license and authentication files

If you are installing Branch Gateway with an S8300 Server as a primary controller, you need license and authentication files for Communication Manager.

You can use the Maintenance Web Interface to assign the IP address of the WebLM Server.

---

## Downloading the firmware

### About this task

You need to download the latest version of firmware for Branch Gateway and media modules to your laptop.

### Procedure

1. Go to the [Avaya support](#) site.
2. Select the latest version of the firmware image file for the hardware you are installing.
3. Download the required firmware image file.

4. Download the Communication Manager service pack that is required for the upgrade.

---

## Branch Gateway authentication file

An authentication file is preinstalled in Branch Gateway. You can update it if needed. Check the authentication file version using the `show auth-file info` function. Branch Gateway firmware versions 6.x and 7.0.0 use 6.x authentication files.

Branch Gateway authentication file is not used in Release 7.1.2 and later.

When FIPS mode is enabled, you cannot log in with the Services access level using the authentication file.

---

## S8300 upgrade with Solution Deployment Manager

From Release 7.0, you can upgrade S8300 using Solution Deployment Manager. For more information about upgrading S8300 firmware using Solution Deployment Manager, see *Administering Avaya Aura® System Manager*.

---

## Site requirements

Inspect the site before installing Branch Gateway. Ensure that the environmental conditions, power and grounding availability, safety, and security conditions meet the Branch Gateway installation requirements.

If the site conditions do not meet the requirements, contact your project manager before proceeding with the installation.

## Temperature and clearance verification

Verify that temperatures and clearances are within the recommended range. You can install the Branch Gateway in a 19-inch rack, mount on a wall, or place on a sturdy table. The ambient temperature must be in the range of 32 to 104°F (0 to 40°C). The humidity must not be higher than 90%. If the conditions are beyond the recommended limits, the thermal sensors can shut down the equipment and it can be damaged.

### Related links

[Specifications](#) on page 133

## Power outlet verification

You must ensure that the required number of power outlets is available. Verify that Branch Gateway and other equipment in the rack do not overload the branch circuit and power distribution strip.

### Related links

[AC Power cord specifications](#) on page 134

## Grounding requirements

Ensure that the installation site has access to approved grounds. A trained technician or a licensed electrician must verify all grounds and install the supplementary ground conductor.

AC powered Branch Gateway has multiple ground connections. The AC power cords contain ground conductors and must be connected to AC outlets that have earth contacts. The supplementary ground conductor provides a non-removable ground even when the AC cords are disconnected.

DC powered G450 requires only the supplementary ground conductor.

In Finland, Norway, and Sweden, Branch Gateway must be installed in a restricted access location (RAL). If you have any questions about the safety conditions, contact your project manager.

### Related links

[Restricted access location \(RAL\)](#) on page 34

---

## Firmware specifications

### New Comcode numbers for G450 Branch Gateway

- 700506953 : G450 MAIN SUPERVISOR BOARD V3
- 700506954 : G450 MAIN SUPERVISOR BOARD V3 NON GSA
- 700506955 : G450 MP160 MEDIA GATEWAY
- 700506956 : G450 MP160 MEDIA GATEWAY NON GSA
- 700506959 : G450 MP80 WITH V3 SVP BOARD
- 700506960 : G450 MP80 WITH V3 SVP BOARD
- 700508199 : G450 160 CHANNEL DSP daughter board
- 700512805 : G450 V4 MAIN BOARD WITH MP160 GSA
- 700512806 : G450 V4 MAIN BOARD WITH MP160 NON-GSA

**Minimum G450 Branch Gateway firmware requirements**

| <b>Firmware version</b> | <b>Build</b> | <b>v1, v2</b> | <b>v3</b> | <b>Recommended Communication Manager version</b>                                                                                                                                                                                          |
|-------------------------|--------------|---------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BGW 10.2                | 43.9.0       | Yes           | Yes       | AA 10.2, CM 10.2<br>AA 10.1.x, CM 10.1.x<br>AA 10.1, CM 10.1<br><br>If your Branch Gateway is running Build 38.20.0 or earlier, you must install Release 7.1.0.4 Build 38.21.2 before upgrading to Build 43.9.0.                          |
| BGW 10.1.x              | 42.24.0      | Yes           | Yes       | AA 10.1.x, CM 10.1.x<br>AA 10.1, CM 10.1<br>AA 8.1.x, CM 8.1.x<br>AA 8.0.x, CM 8.0.x<br><br>If your Branch Gateway is running Build 38.20.0 or earlier, you must install Release 7.1.0.4 Build 38.21.2 before upgrading to Build 42.24.0. |
| BGW 10.1                | 42.4.0       | Yes           | Yes       | AA 10.1, CM 10.1<br>AA 8.1.x, CM 8.1.x<br>AA 8.0.x, CM 8.0.x<br><br>You can upgrade to Release 10.1 Build 42.4.0 and later from Build 38.20.0 or earlier only after installing Release 7.1.0.5 Build 38.21.3.                             |
| BGW 8.1.x               | 41.38.0      | Yes           | Yes       | AA 8.1.x, CM 8.1.x<br>AA 8.0.x, CM 8.0.x<br>AA 7.1.x, CM 7.1.x<br>AA 7.0.x, CM 7.0.x +<br><br>You can upgrade to Release 8.1.x Build 41.24.0 and later from Build 38.20.0 or earlier only after installing Release 7.1.0.5 Build 38.21.3. |

*Table continues...*

| Firmware version | Build   | v1, v2 | v3  | Recommended Communication Manager version                                                                                                                                                                                                                       |
|------------------|---------|--------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BGW 8.1          | 41.9.0  | Yes    | Yes | AA 8.1, CM 8.1<br>AA 8.0, CM 8.0<br>AA 7.1.x, CM 7.1.x<br>AA 7.0.x, CM 7.0.x +<br>You can upgrade to Release 8.1 Build 41.9.0 and later from Build 38.20.0 or earlier only after installing Release 7.1.0.5 Build 38.21.3.                                      |
| BGW 8.0          | 40.10.1 | Yes    | Yes | AA 8.0, CM 8.0<br>AA 7.1.x, CM 7.1.x<br>AA 7.0.x, CM 7.0.x +<br>AA 6.3.x, CM 6.3.x +<br>You can upgrade to Release 8.0 Build 40.10.1 and later from Build 38.20.0 or earlier only after installing Release 7.1.0.5 Build 38.21.3.                               |
| BGW 7.1.3.x      | 39.x.y  | Yes    | Yes | AA 7.0 FP 1, CM 7.0.1<br>AA 7.0, CM 7.0+<br>AA 6.2 FP 4, CM 6.3.6+<br>AA 7.1, CM 6.3.x, AA 7.0, CM 7.1.3<br>You can upgrade to Release 7.1.3 Build 39.16.0 and later 39.x.y from Build 38.20.0 and earlier only after installing Release 7.1.0.5 Build 38.21.3. |
| BGW 7.1.2        | 39.x.y  | Yes    | Yes | AA 7.0 FP 1, CM 7.0.1<br>AA 7.0, CM 7.0+<br>AA 6.2 FP 4, CM 6.3.6+<br>AA 7.1, CM 6.3.x, AA 7.0, CM 7.1.2<br>You can upgrade to Release 7.1.2 Build 39.12.0 and later 39.x.y from Build 38.20.0 and earlier only after installing Release 7.1.0.5 Build 38.21.3. |

*Table continues...*

| Firmware version | Build    | v1, v2 | v3                        | Recommended Communication Manager version                                                                                                                                                                                                                                                                                                                                        |
|------------------|----------|--------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BGW 7.1.0+       | 38.16.0+ | Yes    | Yes                       | AA 7.0 FP 1, CM 7.0.1<br>AA 7.0, CM 7.0+<br>AA 6.2 FP 4, CM 6.3.6+<br>AA 7.1, CM 6.3.x, AA 7.0<br>Branch Gateway requires a 7.x build (37+) to successfully upgrade to Build 38.8.0 or later. Earlier builds will fail with the <code>Invalid file</code> error type. If Branch Gateway is running 36.x or earlier build, you must upgrade to 37.x.y before upgrading to 38.x.y. |
| BGW 7.0.1.2      | 37.41.0  | Yes    | Yes                       | AA 7.0 FP 1                                                                                                                                                                                                                                                                                                                                                                      |
| BGW 7.0.1.1      | 37.39.0  | Yes    | Yes                       | AA 7.0, CM 7.0                                                                                                                                                                                                                                                                                                                                                                   |
| BGW 7.0.1        | 37.38.0  | Yes    | Yes                       | AA 7.0 FP 1, CM 7.0.1<br>AA 6.2 FP 4, CM 6.3.6<br>AA 7.0, CM 7.0                                                                                                                                                                                                                                                                                                                 |
| BGW 7.0.0.2      | 37.21.0  | Yes    | Yes                       | AA 7.0, CM 7.0<br>AA 6.2 FP 4, CM 6.3.6+                                                                                                                                                                                                                                                                                                                                         |
| BGW 7.0.0.1      | 37.20.0  | Yes    | Yes                       | AA 7.0, CM 7.0<br>AA 6.2 FP 4, CM 6.3.6+                                                                                                                                                                                                                                                                                                                                         |
| BGW 7.0          | 37.20.0  | Yes    | Yes                       | AA 7.0, CM 7.0<br>AA 6.2 FP 4, CM 6.3.6+                                                                                                                                                                                                                                                                                                                                         |
| BGW 6.3.14       | 36.18.0  | Yes    | Yes                       | CM 6.3.x, AA 7.0                                                                                                                                                                                                                                                                                                                                                                 |
| BGW 6.3.7+       | 36.16.0+ | Yes    | Yes                       | AA 6.2 FP 4, CM 6.3.6+                                                                                                                                                                                                                                                                                                                                                           |
| BGW 6.3.6 JITC   | 36.x.y   | Yes    | Yes                       | AA 6.2 FP 4, CM 6.3.6<br>AA 6.2 FP3, CM 6.3.2 & CM 5.2.1 SP 16+                                                                                                                                                                                                                                                                                                                  |
| BGW 6.3.5        | 35.x.y   | Yes    | Yes                       | AA 6.2 FP3, CM 6.3.2+<br>AA 6.2 FP 2, CM 6.3 & CM 5.2.1 SP 16+                                                                                                                                                                                                                                                                                                                   |
| BGW 6.3.1        | 34.6.0+  | Yes    | Yes (min FW build 34.6.0) | AA 6.2 FP3 CM 6.3.2+ (Oct 2013)<br>AA 6.2 FP 2, CM 6.3 & CM 5.2.1 SP 16+                                                                                                                                                                                                                                                                                                         |
| BGW 6.3          | 33.13.0  | Yes    | No (base not supported)   | AA 6.2 FP2-CM 6.3 - May 2013                                                                                                                                                                                                                                                                                                                                                     |
| BGW 6.2.1        | 32.26.0  | Yes    | No (base not supported)   | AA 6.2 FP1-CM 6.2 sp4 - Dec 2012                                                                                                                                                                                                                                                                                                                                                 |

---

## Branch Gateway package contents

The Branch Gateway chassis and accessories are shipped in a box. The package contains the following items:

- 1 Branch Gateway chassis. The required media modules are installed.
- One accessories box, containing:
  - Two 19" mounting brackets
  - One cable management assembly
  - One supplementary ground conductor
  - Fifteen 3/8" flat head screws
  - One 5/16" crosspoint screw for grounding
  - One washer for grounding
  - Four rubber feet
  - One jumper for bridging NVRAM init pins

The Avaya Partner Contact Closure adjunct box, if ordered, comes in a separate package.

## Removing power supply units

### About this task

You can remove the power supply unit (PSU) for the simplicity of installation before unpacking the Branch Gateway.

### Procedure

1. Open the package.
2. Turn the Branch Gateway, so that the rear panel points up.
3. To remove the PSU, do the following:
  - a. Loosen two PSU captive screws from each side of the PSU.
  - b. Hold the two side handles and pull the PSU up and out.
  - c. Place the PSU carefully on a flat surface.

If you ordered two PSUs, remove them.

## Unpacking and checking package contents

### About this task

Before installing Branch Gateway, you need to unpack and check the package contents.

#### **Electrostatic alert:**

Wear an anti-static wrist ground strap when handling Branch Gateway components. Connect the strap to an approved ground, such as an unpainted metal surface.

## Procedure

1. Unpack Branch Gateway and accessories.
2. Check the package contents against the customer order.
3. Cross-check the customer order with the planning documentation.

For the list of media modules, phones and other equipment, and their placement, see your planning and shipping documentation.

4. Verify that all necessary elements have been received and are in good condition.
5. Do a damage inspection of the assembly and its component as follows:

- a. Examine all relevant component for damage.
- b. Make a 'defective on arrival - DOA' report or RMA to the operator.

Do not move the shipping carton until the operator examines it. The operator or regional representative initiates the necessary procedure to process the RMA. They guide the network administrator on how to return the damaged package, if necessary.

- c. If no damage is found, unwrap all the components and dispose empty package / cartons(s) under country-specific environmental regulations.

If you have any questions about the equipment order, or if the equipment has been damaged, contact your supplier.

# Chapter 3: Branch Gateway installation

Branch Gateway installation includes the following steps:

| No. | Task                                      | Reference                                                              | ✓ |
|-----|-------------------------------------------|------------------------------------------------------------------------|---|
| 1   | Install the Branch Gateway chassis.       | <a href="#">Branch Gateway chassis mounting</a> on page 25             |   |
| 2   | Install the power supply units.           | <a href="#">Installing PSUs</a> on page 29                             |   |
| 3   | Install media modules.                    | <a href="#">Media module installation</a> on page 29                   |   |
| 4   | Attach ground conductors.                 | <a href="#">Safety ground connections</a> on page 39                   |   |
| 5   | Connect Branch Gateway to a power source. | <a href="#">Connecting Branch Gateway to a power source</a> on page 40 |   |

---

## Branch Gateway chassis mounting

You can mount the Branch Gateway in a rack, on a wall, or on a table.

### **Electrostatic alert:**

When handling any components of S8300 Server or Branch Gateway, wear an antistatic wrist ground strap. Connect the strap to an approved ground, such as an unpainted metal surface.

## Attaching a mounting bracket to the Branch Gateway

### About this task

Branch Gateway is supported by mounting screws through two mounting ears. You should mount units in the lower positions first to avoid balancing and cabling issues.

There are two types of mounting brackets provided with the Branch Gateway:

- Without cable guides: two mounting brackets are provided.
- With cable guides: one mounting bracket is provided. This bracket provides guides for electrical cables and is useful for cable management.

### Procedure

1. Place a bracket at the required mounting position.

2. Attach the bracket to the chassis with five of the fifteen 6-32 x 3/8 in. screws provided.
3. Tighten the screws with a screwdriver.

## Brackets without cable guides

You can attach mounting brackets without cable guides in either of the following positions:

- To each side of the Branch Gateway front for fastening the chassis to the rack at the front.



- To the middle of each side of the Branch Gateway panel for fastening the chassis to the rack at the middle.



## Brackets with cable guides

You can attach a mounting bracket with cable guides to the front of Branch Gateway on one side. If you fasten the chassis to the rack at the front, use the mounting bracket with cable guides as a front bracket.

If you fasten the chassis to the rack at the middle, use the mounting bracket with cable guides at the chassis front together with two regular mounting brackets on chassis sides. In this case, the mounting bracket with cable guides serves for cable management only: You do not need to fasten it to the rack.

### **Note:**

It is recommended to attach the mounting bracket with cable guides to the left side of the rack, so that the cables will not interfere when you replace the fan tray. However, if you are installing an MM717 or MM716 media module, attach the mounting bracket with cable guides to the right side of the rack, to support the weight of the amphenol cable.



## Mounting Branch Gateway in the rack

### About this task

You can mount the Branch Gateway in a standard 19-inch rack. If the rack has another equipment installed, place Branch Gateway so as to prevent imbalance.

The Branch Gateway weighs 21 lb (9.5 kg) empty and up to 44 lb (20 kg) with media modules, an S8300 Server, and two power supply units.

### Before you begin

- Ensure that the Branch Gateway power supply is disconnected.
- Ensure that the rack is bolted to the floor and is earthquake-protected, if required.
- Attach mounting brackets.

### Procedure

1. Insert two mounting screws, one on each side of the rack.

These are the bottom screws of the mounting brackets. Turn the screws only 3–4 times so that a part of them is protruding.

2. Place the Branch Gateway in the rack so that the bracket bottoms are resting on the protruding screws.
3. Place the Branch Gateway in the rack.

Ensure that there is enough space for ventilation.

4. Insert four rack mounting screws, two on each side.
5. Ensure that the Branch Gateway is level.
6. Tighten the rack mounting screws.

Do not over-tighten the screws.

7. Either tighten the two bottommost screws or remove them completely.
8. Ensure that the ventilation vents are not obstructed.

## Placing Branch Gateway on a table

### About this task

If you install Branch Gateway as a tabletop unit, install the provided rubber feet to the underside of the Branch Gateway.

## Procedure

1. Remove the four rubber feet from their packaging.
2. Turn the Branch Gateway upside down.
3. Place each foot into one of the mounting sites, near each corner of the chassis.

## Wall mounting requirements

To mount Branch Gateway on a wall, use two mounting brackets without cable guides. You can also use an additional mounting bracket with cable guides.

You must fasten the Branch Gateway to a plywood board. If the wall does not have a portion of plywood available, mount a plywood sheet, at least  $\frac{3}{4}$  in. (2.0 cm) thick and 4 x 4 ft (1.2 x 1.2 m) in size, horizontally onto the wall. Use a minimum of four wood screws and ensure the screws are driven into wall studs, or use four wall anchors rated with a shear strength of more than 50 lb (22.5 kg) each. To secure the Branch Gateway to the plywood, use a minimum of four pan head screws of  $\frac{3}{4}$  inch. Ensure you have the plywood and mounting equipment hardware.

### **Caution:**

If you install Branch Gateway in the United States of America:

- Do not attach the AC power supply cord to the building wall with wire staples, clamps, and other fasteners.
- You must install Branch Gateway near the AC receptacle (socket outlet) that services Branch Gateway.
- You must install the AC power supply cord in a way that minimizes the risk of physical damage to the cord. The cord must not be hanging down to the floor, or routed in any way that can lead to its damage.

## Mounting the Branch Gateway on a wall

### About this task

One person can wall mount the G450 Branch Gateway if the PSUs are removed. A minimum of two installers are required to wall mount the Branch Gateway with the PSUs installed.

### **Warning:**

Only trained service personnel are allowed to wall mount the Branch Gateway.

## Procedure

1. Attach a bracket to each side of the Branch Gateway, as shown in the following image.



2. Mark the plywood with the location of the Branch Gateway bracket screw holes before fastening the plywood to the wall.
3. Place the Branch Gateway with its front panel facing up.
4. Secure the Branch Gateway to the plywood with screws.

**Related links**

[Brackets with cable guides](#) on page 26

---

## Installing PSUs

**About this task**

After the Branch Gateway chassis is installed, insert the PSU if you removed it before installation.

**Procedure**

1. Place the PSU before the rear opening of the Branch Gateway and align both sides of the PSU with the interior guides.
2. Slide the PSU slowly into the chassis, maintaining an even pressure to ensure that the PSU does not get disengaged from the guides.
3. Close and tighten the two PSU captive screws, one on each side of the PSU.

**Result****Related links**

[Removing power supply units](#) on page 23

---

## Media module installation

When the Branch Gateway chassis is installed and the PSUs are inserted, you can install media modules. Each module is shipped with two thumb screws for fastening to the Branch Gateway chassis.

Do not install an unsupported combination of media modules. Install media modules only to permitted slots.

**\* Note:**

The required media modules are sometimes pre-installed in the Branch Gateway chassis. In this case, skip media modules installation.

**Limitations of media module combinations**

The following limitations apply to combining media modules in Branch Gateway:

- Three MM340 or MM342 WAN modules
- Up to seven MM721 modules
- The MM760 media module is not supported

G450 Branch Gateway v4 does not support MM340 and MM342 media modules.

**Slot allocations**

The Branch Gateway chassis has eight media module slots, marked V1, V2, V3, V4, V5, V6, V7, and V8. Each media module is restricted to certain slots.

Allocate a slot for the media module. Ensure your media module type matches the allocated slot.

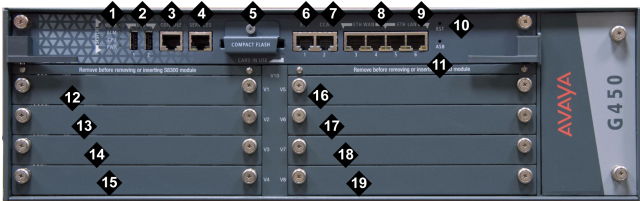


**Figure 1: G450 Branch Gateway front panel ports and slots**

- |                                                              |                                                 |
|--------------------------------------------------------------|-------------------------------------------------|
| 1. System (SYSTM) LEDs                                       | 11. ASB button                                  |
| 2. USB ports                                                 | 12. V1: slot for a media module or S8300 Server |
| 3. Console (CNSL) port                                       | 13. V2: slot for a media module                 |
| 4. Services (SVCS) port                                      | 14. V3: slot for a media module                 |
| 5. Compact Flash (CMPCT FLSH) slot; Card in Use (CF BSY) LED | 15. V4: slot for a media module                 |
| 6. ETR (Emergency Transfer Relay) port                       | 16. V5: slot for a media module or S8300 Server |
| 7. CCA (Contact Closure) port                                | 17. V6: slot for a media module                 |
| 8. ETH WAN ports                                             | 18. V7: slot for a media module                 |
| 9. ETH LAN ports                                             | 19. V8: slot for a media module                 |
| 10. RST button                                               |                                                 |

The following table describes compatible slots for each media module type.

| Media module       | Permitted slots | Description                                                                                               |
|--------------------|-----------------|-----------------------------------------------------------------------------------------------------------|
| MM340 <sup>1</sup> | V3, V4, V8      | One E1/T1 WAN port for connecting to a WAN endpoint device                                                |
| MM342 <sup>1</sup> | V3, V4, V8      | One USP WAN port for connecting to a WAN endpoint device.                                                 |
| MM710              | V1–V8           | One E1/T1 trunk port for connecting an E1/T1 telephone trunk.                                             |
| MM710B             | V1–V8           | One E1/T1 trunk port for connecting an E1/T1 telephone trunk.                                             |
| MM711              | V1–V8           | Eight universal analog ports for connecting analog phones or trunks.                                      |
| MM712              | V1–V8           | Eight ports for connecting DCP phones.                                                                    |
| MM714              | V1–V8           | Four analog ports for analog phones and four ports for analog trunks.                                     |
| MM714B             | V1–V8           | Four analog ports for analog phones, four ports for analog trunks, and an emergency transfer relay.       |
| MM716              | V1–V8           | One amphenol connector that connects to a punch-down block to provide 24 analog line ports.               |
| MM717              | V1–V8           | One amphenol connector that connects to a punch-down block to provide 24 ports for connecting DCP phones. |
| MM720              | V1–V8           | Eight ports for connecting up to eight ISDN trunks or 16 ISDN BRI stations.                               |
| MM722              | V1–V8           | Two ports for connecting ISDN trunks.                                                                     |
| S8300              | V1              | For connecting Avaya Aura <sup>®</sup> server.                                                            |

1. G450 Branch Gateway v4 does not support the MM340 and MM342 media modules.

## Media module installation precautions

You can bend or damage the connector pins if you roughly handle the module or misalign it and then force into position.

### **Electrostatic alert:**

Hold the module only by the edges to avoid damage from static electricity. Do not touch the top or bottom of the circuit board. If possible, wear a wrist strap and use an antistatic bag.

Separate ESD paths to the chassis ground connect to the media modules at the spring-loaded captive screws. Use a screwdriver to ensure the captive screws are securely tightened to prevent equipment damage.

To eliminate electrical hazards for unauthorized personnel and ensure continued compliance to radiated emissions requirements, you must securely tighten all captive screws so that they cannot be loosened without the use of a tool.

After installing media modules, cover empty slots with the supplied blank plates. Using Branch Gateway with open slots can cause overheating due to inadequate air distribution.

## Installing S8300 Server

### About this task

You can install an S8300 Server in slot V1 on the left side of the Branch Gateway.

### Procedure

1. Remove the plate above slot V1.
2. Remove the blank plate from slot V1.
3. Align the server with the V1 bay opening and engage both sides of the module with the interior guides.
4. Slide the server slowly into the chassis, maintaining even pressure to ensure that the module does not get twisted or disengaged from the guides.



5. Apply firm pressure to engage the connectors.  
The connector has pins of different length. Long pins get engaged first to provide grounding. Medium and short length pins provide power and signal.
6. Tighten the spring-loaded captive screws to lock the media module into the chassis.
7. Remove the plate labeled **Remove before removing or inserting S8300 module** above the slot V1 and tighten the screws on the front plate.
8. After you insert the server module, insert the other media modules.

Make sure to insert each module in a slot corresponding to the module type.

## Installing media modules

### About this task

After you install an S8300 Server module, if applicable, install media modules. Make sure to insert each module in the corresponding slot.

### Procedure

1. Remove the blank plate from the empty bay.
2. Align the media module with the selected bay on the front of the Branch Gateway chassis and engage both sides of the module with the interior guides.
3. Slide the module slowly into the chassis, maintaining even pressure to ensure that the module does not get twisted or disengaged from the guides.



4. Apply firm pressure to engage the connectors.

The media module connector has pins of different length. Long pins get engaged first to provide grounding. Medium and short length pins provide power and signal.

5. Tighten the spring-loaded captive screws to lock the media module into the chassis.

### Next steps

After you connect the phones to the various media modules, add circuit protection to the lines.

---

## General grounding requirements

For safe installation and operation of the Branch Gateway, carefully read all requirements, recommendations, and instructions.

System grounding must comply with the general grounding rules provided in Article 250 of the National Electrical Code (NEC), National Fire Protection Agency (NFPA) 70, or the applicable electrical codes in the country of installation.

Grounding requirements differ widely among countries. With addition to the grounding instructions in this section, you must follow the local electrical installation codes for your location.

For AC powered systems and mixed AC and DC powered systems, the following two safety grounds are required to ensure safe operation of Branch Gateway:

- The ground conductors in the AC power cords.
- The supplementary ground conductor, a field-installed green and yellow conductor.

Connect all of the safety grounds to an approved ground. If a power cord accompanies the Branch Gateway, use that cord whenever possible.

For DC powered systems, use only the supplementary ground connector.

### **Warning:**

Ensure that you follow grounding recommendations. Otherwise, the system:

- Becomes unsafe for personnel handling or using the equipment.
- Is not adequately protected from lightning or power transients.
- Is subjected to service interruptions.

## Installation location

When selecting a location for the Branch Gateway installation, ensure that you can connect it to the supplied secondary ground conductor. If the location does not meet this requirement, contact a licensed electrician to install a supplementary ground conductor per Article 250 of the National Electrical Code (NEC).

## Supplementary ground conductor

A supplementary ground conductor is provided with the equipment. It is constructed of a 10 AWG (4.0 mm<sup>2</sup>) wire, with an insulated ring terminal crimped to one end, which is suitable for the #8 (M4) stud or screw on the rear of the Branch Gateway chassis.

You need to provide a means of connecting the supplementary ground conductor to an approved ground according to Article 250 of the National Electrical Code (NEC).

## Ground block

When installing multiple Branch Gateway devices, use the ground block supplied by the customer. Only a licensed electrician can install the ground block.

The ground block intended for rack mounting has ten terminals for terminating supplementary ground conductors. You can ground up to ten Branch Gateway devices at the block, installed on a rack close to the equipment. Then you can route a single ground conductor from that block to an approved ground.

### **Danger:**

Failure to install all safety grounds provided with the Branch Gateway voids the UL and the CE mark product safety certifications. It is hazardous and can cause death or severe personal injury.

## Restricted access location (RAL)

In Finland, Norway, and Sweden, you must install the Branch Gateway in a restricted access location (RAL), due to unreliable earthing concerns. Only service personnel who have been instructed about the restricted access, and safety precautions can access RAL. Service personnel can access Branch Gateway using a tool, such as a lock and key, or other means of security.

### **Warning:**

For installations in Finland, Norway, and Sweden, the AC powered Branch Gateway relies on two ground connections: the mains plug with an earth contact and a supplementary ground conductor.

## Approved grounds

There are two methods for equipment grounding.

- Based on NFPA 70: National Electrical Code (NEC). You must comply with NFPA 70: NEC or with the equivalent local electrical code or grounding requirements.
- Based on ANSI/EIA/TIA-607 Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications (TIA-607), which provides an enhanced, communication-specific grounding scheme.

### Important:

Ensure that approved grounds are accessible from the installation site and that a trained technician or licensed electrician all grounds and a supplementary ground conductor.

If required, hire a certified power contractor or auditor prior to system installation or cutover.

## NFPA 70: NEC

Compliance with NFPA 70: NEC provides suitable grounding for the Avaya equipment.

In buildings without a ground-cabling infrastructure complying with TIA-607, the Avaya equipment must be grounded by connection to the nearest accessible location on approved building grounds. The following are approved grounds in keeping with the NFPA 70: National Electrical Code of the United States (NEC). For additional information regarding these grounds, view NEC, Article 250.52.

### AC service panel

AC ground at the AC service panel serving the Avaya equipment.

### Danger:

- Do not perform work inside electrical panels unless you are a qualified electrician.
- Do not try to remove bonding conductors without approval from qualified personnel.

### Metal water pipe

The water pipe must meet all the following requirements:

- The entire length of the pipe must be visible, except for short sections passing through walls, ceilings, etc.
- The pipe must be metallic through its length, or made electrically continuous by bonding around insulation joints or insulating pipe.
- The pipe must be routed underground for at least 10 ft (3 m).

Where a metal water pipe is used as an approved ground, the following requirements apply to the host building:

- The building must be industrial, commercial, or institutional, where only qualified persons service the water piping.
- The building does not rely only on the metal water pipe for grounding: a supplemental ground is required. For more information, see NEC Article 250.53.

## Metal frame of the building

The qualified personnel must connect the metal frame member (I-beam, pillar) to earth by one of the following methods:

- In direct contact with the earth, or encased in concrete that is in direct contact with the earth, for at least 10 ft (3 m).
- To the reinforcing bars of a concrete-encased electrode. The electrode must be encased by at least 2 in. (5.1 cm) of concrete and located within and near the bottom of a concrete foundation or footing in direct contact with the earth. The electrode must be at least 20 ft (6.1 m) of one or more steel reinforcing bars or rods, 0.5 in. (1.3 cm) in diameter, or at least 20 ft (6.1 m) of bare solid copper, 4 AWG (26 mm<sup>2</sup>) wire.
- To a ground ring. A ground ring is a buried ground that encircles a building, having a length of at least 20 ft (6.1 m) of 2 AWG (35 mm<sup>2</sup>) bare copper wire.
- To rod and pipe electrodes. A rod or pipe electrode consists of one 5/8 in. (1.6 cm) solid rod or 3/5 in. (2 cm) conduit driven to a minimum depth of 8 ft (2.4 m).
- To plate electrodes. Plate electrodes have a minimum of 2 ft<sup>2</sup> (0.185 m<sup>2</sup>) of metallic surface exposed to the exterior soil.

## Approved floor grounds

Floor grounds are those grounds on each floor of a high-rise building that are suitable for connection to the ground terminal in the riser closet and to the equipment single-point ground terminal. Approved floor grounds can include the following:

- Metal frame of the building.
- The grounding conductor for the secondary side of the power transformer feeding the floor.
- A grounding point specifically provided in the building for that purpose.

### Warning:

If the approved ground or approved floor ground can be accessed only inside a dedicated power equipment room, then a licensed electrician must make connections to the ground.

## ANSI/EIA/TIA-607

TIA-607 defines an intra-building ground-wiring scheme for communications equipment and specifies equipment connection or grounding points. According to TIA-607, the underlying building grounding infrastructure must be set in compliance with NFPA 70: NEC or the equivalent local electrical code or grounding requirements.

In buildings where a ground-cabling infrastructure complying with TIA-607 has been implemented, the Avaya equipment must be grounded according to the TIA-607 standard. In a TIA-607 installation, the Telecommunications Main Grounding Busbar (TMGB) or Telecommunications Grounding Busbar (TGB) links the telecommunications equipment to the ground.

Other grounding terminology is:

- Building principle ground, normally in a building with one floor.
- Floor ground bar, normally in buildings with more than one floor.

Configure telecommunications subsystems, such as groups of frames or equipment, as separate single-point ground entities connected to the dedicated service panel through a single-point

ground bar. The service panel ground connects to the building principle ground through the main service panel or, in a TIA-607 installation, through the TGB.

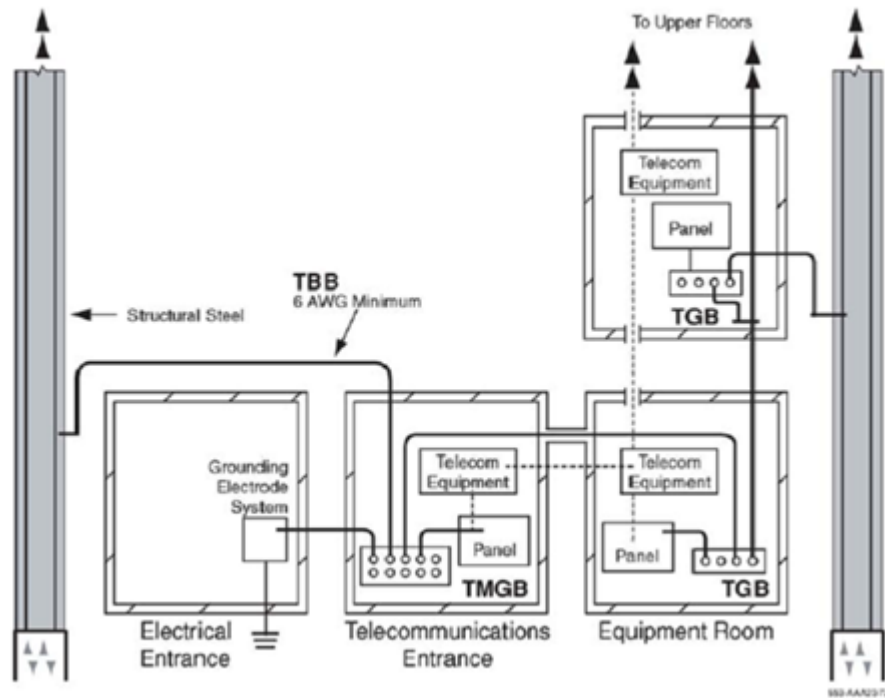


Figure 2: ANSI/TIA/EIA-607 grounding schematic

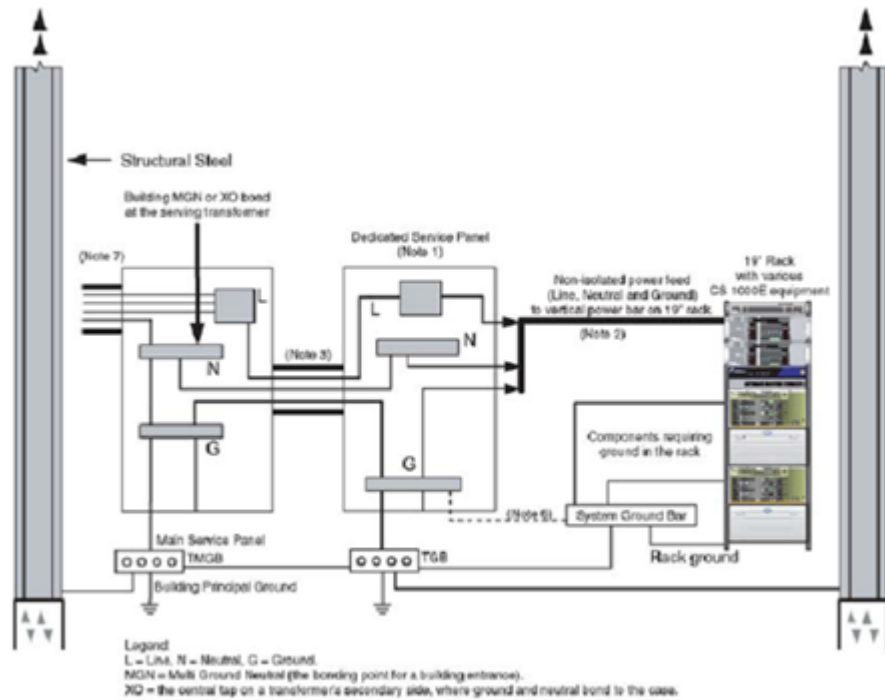


Figure 3: Typical wiring plan

## Connecting DC Power Source

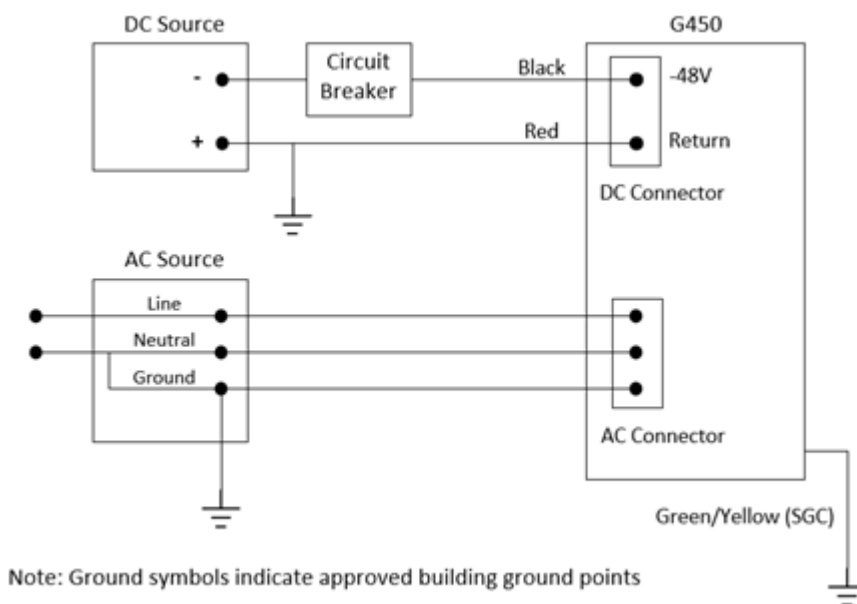
### About this task

For a G450 Branch Gateway with a DC power supply, use a -48 V nominal (-43 V min, -57 V max) DC power source capable of supplying 13.6 A / 585 watts per G450 DC power supply.

### Procedure

1. Connect the DC power cord to the DC power source as follows:
  - a. Use the DC power cord specified in this document.
  - b. Verify that the positive terminal of the DC source is connected to an approved building ground. If not, stop installation until a DC source with positive output grounding is available.
  - c. Connect the red conductor to the positive terminal (return).
  - d. Connect the black conductor to a circuit breaker. See Circuit breaker specifications.
  - e. Make sure the circuit breaker is open (turned off).
  - f. Connect the other end of the circuit breaker to the negative terminal of the DC source (-48 V).
2. Connect the DC power cord to the G450 Branch Gateway as follows:
  - a. Connect the DC connector of the power cord to the G450 Branch Gateway DC power supply input.
  - b. Verify all connections are correct and close the circuit breaker to power up the G450 Branch Gateway.

### Example



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## Circuit breaker specifications

- Select a 15 A circuit breaker rated for DC power applications with a 1 second trip time for an over-current of 50 A or higher, or with a Curve Code “C”.
- Select a circuit breaker that is UL listed in UL 489.
- Locate a circuit breaker that is either adjacent to or is a part of the DC source.
- Connect the circuit breaker to the negative lead of the DC source.
- Install a single circuit breaker for each G450 Branch Gateway power supply.
- Do not share circuit breakers or DC power cords.

**Note:**

Use only the DC power cord specified in this document and the SGC cable provided with the Gateway.

**Danger:**

Do not install the Gateway further from the DC source, or an approved building ground, than the specified cables allow.

---

## Safety ground connections

Proper grounding of the Branch Gateway installation protects the system, users, and service personnel from lightning, power surges, AC mains faults, power crosses on central office trunks, and electrostatic discharge (ESD).

When installing the Branch Gateway, you must follow the local electrical installation codes.

**Danger:**

In AC powered systems, connect through both the AC Power Cord and the supplementary ground conductor for safe operation of the Branch Gateway.

For DC powered systems, you only need the supplementary ground connector.

**Warning:**

An improper ground can cause an electrical shock, equipment failures, and service outages.

## Attaching the ground wires

### About this task

Perform the following procedure for each Branch Gateway.

### Procedure

1. Remove the ground screw on the rear of the chassis adjacent to the ground symbol.

2. Attach the ring terminal end of the 10 AWG (4.0 mm<sup>2</sup>) supplementary ground conductor to the G450 chassis by using the ground screw on the lower right corner at the rear of the G450 Branch Gateway.
3. Insert the ground screw on the rear of the chassis adjacent to the ground symbol and tighten the screw such that it cannot be loosened without the use of a tool.

## Attaching ground wires to purchased ground blocks

### About this task

You can use a ground block with more than one Branch Gateway in the rack. If you want to use a ground block, you must purchase it and have it installed by a licensed electrician.

Supplementary ground conductor has one end attached to the grounding screw on the chassis.

### Warning:

Do not coil the supplementary ground conductor or ground wire.

### Procedure

1. Cut the supplementary ground conductor to the length needed to terminate it into one of the terminals of the ground block.
2. Attach one end of the remaining 10 AWG (4 mm<sup>2</sup>) ground wire to one of the terminals in the ground block and the other end to an approved ground.
3. Cut the ground wire to the length needed to reach the approved ground.

## Attaching ground wires without ground blocks

### Procedure

1. Attach the supplementary ground conductor to an approved ground.
2. Connect the AC power cable to the inlet receptacle on the rear of the Branch Gateway chassis.
3. **(Optional)** If you have a second PSU, connect it to a power source.

### Related links

[Connecting Branch Gateway to a power source](#) on page 40

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## Connecting Branch Gateway to a power source

### About this task

You can connect a Branch Gateway to a power source after you have mounted the Branch Gateway, installed the PSU, media modules, and attached the supplementary ground conductor. You can order a Branch Gateway with one or two PSUs.

## Procedure

1. Using the AC power cords supplied with the Branch Gateway, connect the AC power cord to the AC connector on the Branch Gateway back panel. If a DC power cord is also supplied, connect the DC power cord to the DC connector on the Branch Gateway back panel.
2. Plug the AC power cable into an AC wall outlet. If supplied, plug the DC power cable into a DC power source.

When the Branch Gateway is switched ON, the PWR LED on the front panel comes ON. The CPU LED comes ON if the firmware is running.

At least one LED on each media module, except S8300 Server, comes ON and then goes OFF after about 20 seconds.

## PWR LED indications

The PWR LED on the PSU indicates the operational status of the unit.

| LED | Name  | State | Color | Description                       |
|-----|-------|-------|-------|-----------------------------------|
| PWR | Power | On    | Green | Power supply is stable.           |
|     |       | On    | Red   | A power supply fault.             |
|     |       | Off   | –     | The PSU is broken or not powered. |

If two PSUs are installed in the Branch Gateway, the PWR LED blinks if only one PSU is connected to power, and is steady if both PSUs are connected to power.

# Chapter 4: Connecting peripheral devices

You can connect external endpoint devices to the front panel ports of the installed media modules and to the fixed front panel ports. Mount the Branch Gateway and insert all media modules before you connect the endpoint devices.

You must connect peripheral devices in the following order:

1. Data and voice devices
2. Circuit protection
3. Wide Area Network (WAN)
4. Coupled Bonding Conductor (CBC)
5. Avaya Partner Contact Closure Adjunct



## **Warning:**

To reduce the risk of fire, use only 26-AWG or larger telecommunication line cords when installing phones or adjuncts, or connecting to media module telecommunication ports.

---

## Data and voice device connections

You can connect data and voice devices in various ways. To connect devices to specific ports, refer to your planning documentation for topology requirements. As you connect devices, keep a record of the slots and ports into which specific devices are connected. You will need this information when configuring the Branch Gateway.

## Switch and network data ports

You can connect one or more LAN switches to either of the ETH LAN ports on the Branch Gateway front panel.

For G450 Branch Gateway v3, use Shielded Twisted Pair (STP) CAT5e cables to connect to the jacks labeled “ETH WAN” or “ETH LAN” in the countries that require the EN55022/EN55032 compliance.

## IP phone connections

You must connect an IP phone to an external Ethernet switch. On G450 Branch Gateway, you must connect this switch to a LAN port. This port is labeled “10/5” or “10/6”.

If the phone is not an Avaya IP phone, you can connect it to any port on the network switch. Note the slot and port number on G450 Branch Gateway to which you connect the phone.

For a full list of supported phones, see *Avaya G450 Branch Gateway Overview and Specification*.

## Connecting a phone to Branch Gateway

### Procedure

1. Connect the phone to a port on the switch connected to the Branch Gateway LAN port.  
If the switch is PoE, you do not need to plug the phone into the power supply.
2. Plug the phone into the telephone port.
3. **(Optional)** If the phone is powered independently, do the following:
  - a. Plug the phone into the power supply.
  - b. Check that the phone is powered up.

## ISDN BRI station connections

Each ISDN port on the MM720 and MM721 media module supports up to two ISDN BRI stations.

You cannot administer MM720 and MM721 BRI media modules to support both BRI trunks and BRI stations at the same time. However, MM720 and MM721 BRI media modules support combining both B-channels to form a 128-kbps channel. Communication Manager 3.1 supports combining B-channels using BONDing to form a high-bandwidth connection.

If you administer the MM720 or MM721 BRI media module to support BRI stations, you cannot use it as a clock synchronization source.

## Connecting an ISDN BRI station to an ISDN port

### Procedure

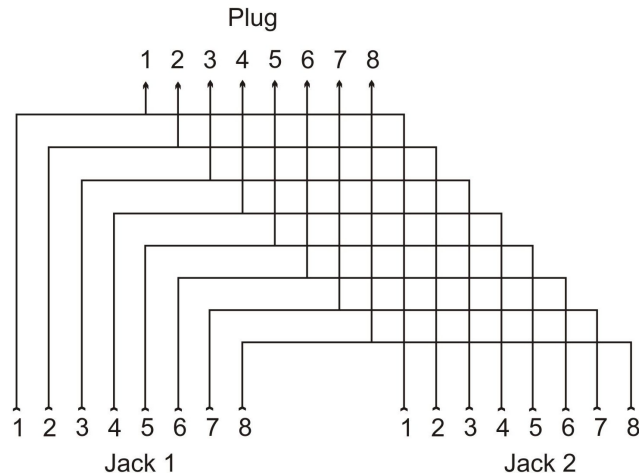
Connect the station via a standard 8-pin BRI cable to one of the ISDN ports on the MM720 media module.

## Connecting two ISDN BRI stations to an ISDN port

### Procedure

1. Connect each BRI station to an RJ-45 splitter that provides two RJ-45 4-pair jacks and one RJ-45 male connector.

The following image shows the correct wiring for the RJ-45 splitter.



2. Connect the splitter male connector to one of the ISDN ports on an MM720 or MM721 media module.

The following images show the ISDN port location for MM720 and MM721 media modules.

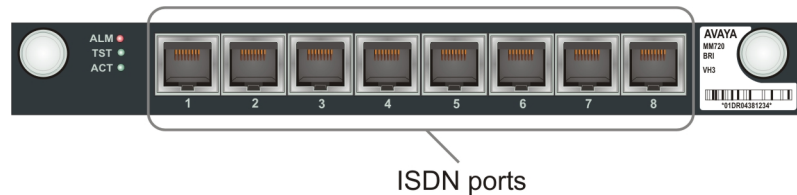


**Figure 4: MM720 media module ISDN ports**

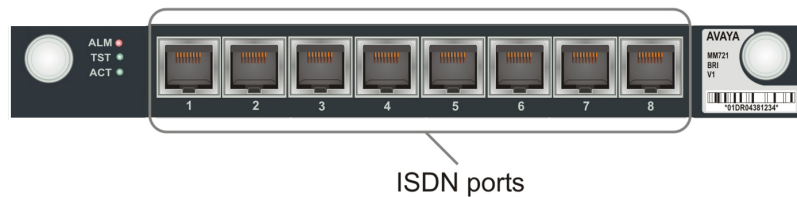


**Figure 5: MM721 media module ISDN ports**

## Connecting an analog phone

### About this task

Analog line ports support up to 2,000 ft (609.6 m) for the phone equipment with a ringer load below 3 REN.

For a full list of supported phones, see *Avaya G450 Branch Gateway Overview and Specification*.

### Procedure

1. Connect the phone to one of the following analog ports:
  - A universal analog port on an MM711 media module.

- An analog line port on the punch down block connected to an MM716 media module.

To connect the MM716 media module to a punch down block, see [Connecting devices to the MM717 and MM716 media modules](#) on page 48.

- A LINE port on an MM714 or MM714B media module.

2. Plug the phone into the telephone port.

The following images show the analog port location on MM711, MM714, MM714B, and MM716 media modules.

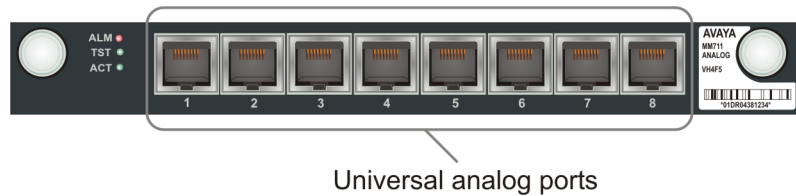


**Figure 6: MM711 media module analog ports**

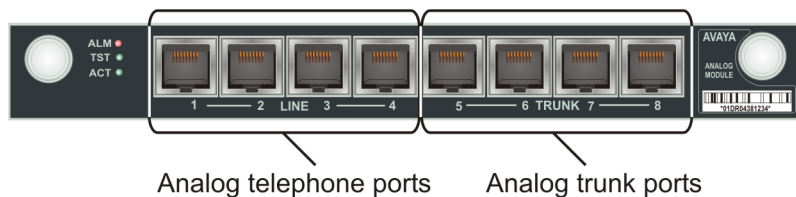


**Figure 7: MM714 media module analog ports**

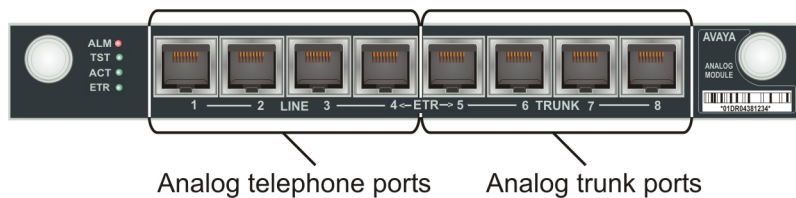


**Figure 8: MM714B media module analog ports**

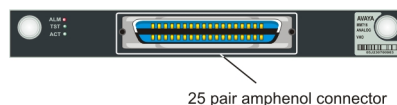


**Figure 9: MM716 media module amphenol connector**

## Connecting a DCP phone to an MM712 or MM717 media module

### About this task

The MM712 media module supports 8 DCP ports and the MM717 media module supports 24 DCP ports, via a single 25-pair amphenol socket on the Branch Gateway front panel.

For a list of supported DCP phones, see *Avaya G450 Branch Gateway Overview and Specification*.

**Warning:**

Avaya MM712 and MM717 DCP lines require 146E IROB protectors, or 4C3S-75 solid-state 5-pin protectors when they are used for any connection routed out-of-building. These protection devices provide both overvoltage and overcurrent protection.

**Procedure**

Wire a telephone port to a DCP port on Branch Gateway.

The following images show the DCP port location on MM712 and MM717 media modules.

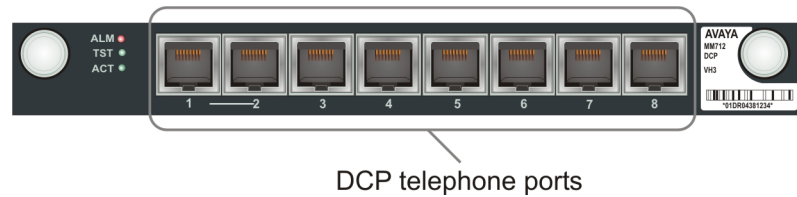


**Figure 10: MM712 media module DCP ports**

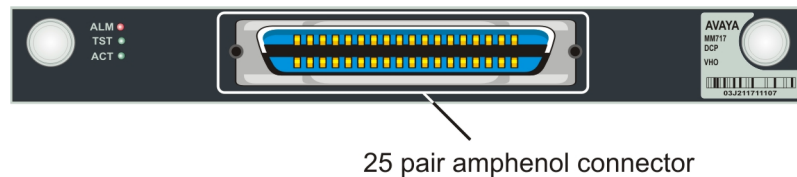


**Figure 11: MM717 media module DCP ports**

**Related links**

[Connecting phones to MM716 and MM717 media modules](#) on page 48

## Connecting an analog trunk

**Procedure**

Connect the analog trunk to one of the following ports:

- Any universal analog port on an MM711 media module.
- One of the trunk ports on an MM714 or MM714B media module.

## Connecting an analog DID trunk

**About this task**

You can connect a DID trunk to Branch Gateway using one of the compatible ports.

The trunk analog telephone port on the Branch Gateway front panel forms a mechanical analog relay with the LINE port next to it. You can configure this relay to provide emergency transferred telephone service in the case of a power outage or disconnection from an external server. During an emergency situation, all incoming calls on the trunk are directed to the phone plugged into the LINE port. The phone also uses the trunk for outgoing calls.

## Procedure

Connect the analog DID trunk to one of the following ports:

- Any universal analog port on an MM711 media module.
- Any analog line port on a punch-down block connected to an MM716 media module.
- One of the line ports on an MM714 or MM714B media module.
- The trunk port on the Branch Gateway front panel.

## Related links

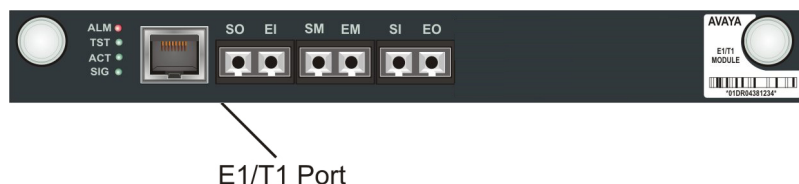
[Connecting phones to MM716 and MM717 media modules](#) on page 48

## Connecting an E1/T1 trunk

### Procedure

Connect the trunk cable to the E1/T1 port on an MM710 or MM710B media module.

The following image shows the E1/T1 port location on an MM710B media module.



The SIG LED lights.

## Connecting an ISDN BRI trunk

### About this task

In the U.S., you need to connect a separately purchased NT1 device to each ISDN port that you use to connect an ISDN BRI trunk.

### Procedure

Connect the trunk to any ISDN port on an MM720, MM721, or MM722 media module.

The following images show the ISDN port location on MM720, MM721, and MM722 media modules.

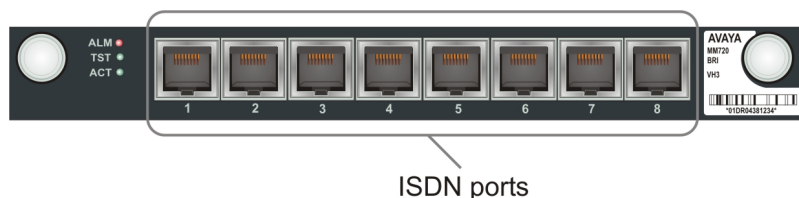


**Figure 12: MM720 media module ISDN ports**

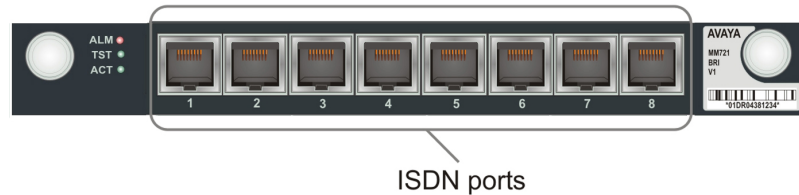


Figure 13: MM721 media module ISDN ports

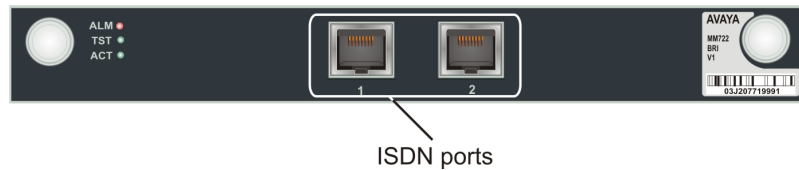


Figure 14: MM722 media module ISDN ports

## Connecting phones to MM716 and MM717 media modules

### About this task

The MM716 and MM717 media modules have a single 25-pair amphenol socket on the front panel, which you can use with a punch-down block.

### Procedure

Connect the front panel connector to a punch-down block.

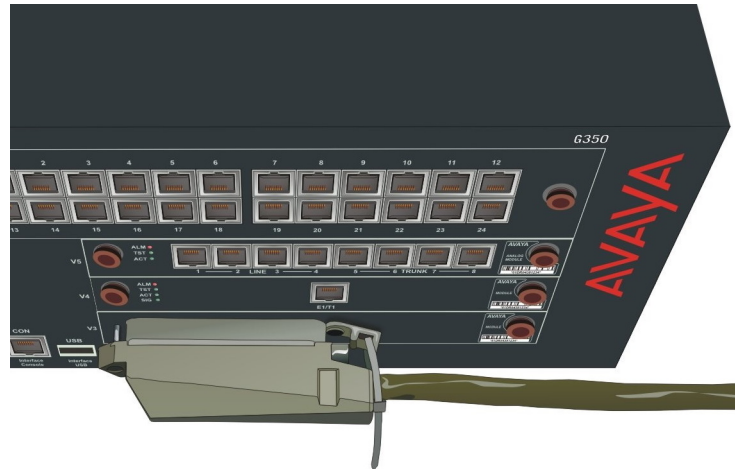
You can terminate up to 24 phones on the connected punch-down block.

## Connecting an MM716 and MM717 front panel connector to a punch-down block

### Procedure

1. Connect one end of a CAT-5 cable with a 25-pair amphenol connector at each end to the 25-pair socket on the front panel of an MM716 or MM717 media module.  
  
The cable must allow plugging the connector into the media module at an angle of 90° to the cable.
2. Extend the cable to the right of Branch Gateway.
3. Tighten the end screw of the amphenol connector to securely fasten the connector to the left side of the front panel socket.
4. Thread a tie wrap through the small bracket to the right of the front panel socket.
5. Fasten the tie wrap around the cable to secure the cable to the right side of the front panel socket.

The following image shows attaching and securing an amphenol cable to the MM716 or MM717 25-pair socket.



6. Connect the other end of the amphenol cable to a punch-down block that converts the single amphenol connector to 24 RJ-11 jacks.

You can now connect endpoint devices to the RJ-11 jacks.

#### Related links

[MM716 ports](#) on page 128

[MM717 ports](#) on page 129

## Connecting and enabling a USB modem for remote access

### Modems for remote access

You can connect a modem to the Branch Gateway to enable the configuration from a remote location. You can use a serial modem connected to the Branch Gateway for the modem dial backup feature, which provides a redundant connectivity with a remote primary Media Gateway Controller. Modem dial backup provides better survivability than switching to a secondary Media Gateway Controller because more features are preserved.

If S8300 is installed in Branch Gateway, leave a modem connected permanently to enable reporting of alarms to remote locations.

Modem access is not supported if FIPS mode is enabled in the gateway.

---

## Circuit protection installation

All out-of-building trunks, lines, and terminal installations require protection from sneak currents and over-voltages, such as lightning and power line induction. Campus installations (interbuilding cabling) of phones or other standard devices require over-voltage and sneak current protection in both buildings. You must install over-voltage and sneak current protectors in accordance with subsections "Protective Devices" and "Cable and Primary Protector Bonding and Grounding" of NFPA 70: NEC Article 800 , or local safety codes.

Field installed sneak current protectors must have a maximum current rating of 350mA and a minimum voltage rating of 600V.

The following over-voltage and sneak current protection devices are approved for use with G450 Branch Gateway:

| Media modules                                              | Approved over-voltage and sneak current protection devices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Avaya MM710, MM710B, or MM340 T1/E1 media modules          | Over-voltage and sneak current protection for these interfaces are provided on the media modules themselves.<br><br>G450 Branch Gateway v4 does not support the MM340 media module.                                                                                                                                                                                                                                                                                                                                                                                                 |
| Avaya MM711, MM714, MM714B, and MM716 analog media modules | Over-voltage and sneak current protection for these interfaces is provided on the media modules themselves. Normally, the local phone company provides primary over-voltage protection for incoming trunks.<br><br>Analog voice terminals require one of the following types of combined over-voltage and sneak current protection at both building entry points: <ul style="list-style-type: none"> <li>• Gas tube with heat coil. 4B1E-W</li> <li>• Solid state with heat coil. 4C1S</li> <li>• IROB (In-Range Out-of-Building). 146C (4 - lines) or 146H (25 - lines)</li> </ul> |
| Avaya MM712 and MM717 DCP media modules                    | Out-of-building connections require either the 146E IROB or 4C3S-75 solid state protectors for over-voltage and sneak current.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Avaya MM722 ISDN-BRI media modules                         | Over-voltage and sneak current protection are provided on the media modules themselves.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Avaya MM720 and MM721 ISDN-BRI media modules               | All out-of-building installations on both trunk (network) and line (customer) sides require either the 146E IROB or 4C3S-75 solid state protectors for over-voltage and sneak current. Trunk side applications also require an NT-1 device.                                                                                                                                                                                                                                                                                                                                         |

 **Warning:**

Only service-trained personnel can install these circuit protection devices.

---

## WAN connections

You can connect Branch Gateway directly to a WAN endpoint device because Branch Gateway has an internal router. You can also connect a WAN endpoint device to Branch Gateway through an external router.

**\* Note:**

WAN media modules are end-of-sale since 2010 and not supported on G450 Branch Gateway v4.

Depending on the WAN link type, the procedures of connecting WAN to Branch Gateway are different.

## Connecting a WAN link to the MM342 media module

### About this task

You must connect the WAN link to a device connected to the Avaya MM342 media module.

Use one of the following cable types, depending on the service provider's equipment:

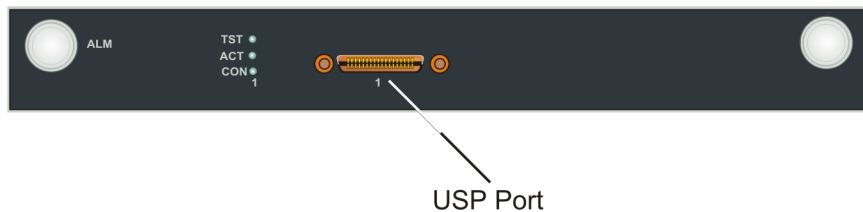
- Avaya serial cable DTE V.35
- Avaya serial cable DTE X.21

G450 Branch Gateway v4 does not support the MM342 media module.

### Procedure

Plug the WAN line into the USP port on the MM342 media module.

The following image shows the USP Port location on the MM342 media module:



## Connecting an E1/T1 WAN link to the MM340 media module

### About this task

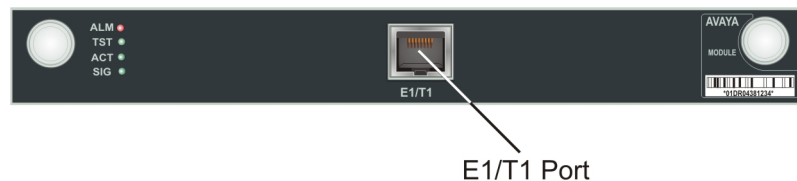
Use an unshielded twisted pair cable, straight or crossover, depending on the WAN equipment.

G450 Branch Gateway v4 does not support the MM340 media module.

### Procedure

Plug the WAN line into the E1/T1 port on the MM340 media module.

The following image shows the E1/T1 port location on the MM340 media module:



## Connecting an Ethernet WAN link

### About this task

You must connect the Ethernet WAN line, such as DSL and firewall, to the Ethernet WAN port. Use a CAT5 Ethernet cable to connect the WAN line to the port.

For G450 Branch Gateway v3, use Shielded Twisted Pair (STP) type CAT5e cables to connect to the jacks labeled "ETH WAN" or "ETH LAN" in the countries that require the EN55022/EN55032 compliance.

### Procedure

On the front panel of the Branch Gateway chassis, connect the Ethernet WAN line to the port labeled "ETH WAN".

## Connecting an external router to Branch Gateway

### Procedure

Connect a router to one of the following ports on the Branch Gateway:

- The ETH WAN ports on the Branch Gateway front panel.
- The ETH LAN ports on the Branch Gateway front panel.

For G450 Branch Gateway v3, use Shielded Twisted Pair (STP) type CAT5e cables to connect to the jacks labeled "ETH WAN" or "ETH LAN" in the countries that require the EN55022/EN55032 compliance.

---

## Coupled Bonding Conductor installations

The Coupled Bonding Conductor (CBC) provides mutual inductance coupling between the CBC and the phone cables that are exposed to lightning. The conductor can be a 10 AWG (4 mm<sup>2</sup>) wire tie wrapped to the exposed cables, a metal cable shield around the exposed cables, or six spare pairs from the exposed cable. In a high-rise building, connect the CBC to an approved building ground on each floor.

## Installing the CBC

### Before you begin

Ensure the phone lines are cross-connected to the required media module.

### Procedure

1. Connect one end of the conductor to a phone cable building entrance protector ground that is connected to an approved ground.
2. Route the rest of the conductor next to the exposed phone cables being protected until they reach the cross-connect nearest to the phone system.

3. Connect the other end to the single-point ground block provided for the phone system.

You must place the non-exposed phone cables at least 12 in. (30.5 cm) away from the exposed phone cables.

---

## Avaya Partner Contact Closure Adjunct installations

The Contact Closure feature is a controllable relay providing dry contacts for various applications. To implement the contact closure feature, you must connect an Avaya Partner Contact Closure Adjunct box to the CCA port on the Branch Gateway chassis. The adjunct box provides two contact closures that you can operate in a “normally closed” or “normally open” state. The contact closures can control auxiliary devices, such as devices that automatically lock or unlock doors or voice recording units. You can configure the CCA port so that an end device, such as a phone, can control the connected devices. For example, a user can unlock a door by keying a sequence into a phone keypad.

### Installing the contact closure

#### About this task

To connect the Avaya Partner Contact Closure adjunct box to the Branch Gateway, use a 24 gauge minimum phone wire, no longer than 200 ft, with a standard four wire RJ-11 connector.

During the installation, note which device you connect to each relay. You will need this information for configuration.

#### Procedure

1. Follow the installation instructions in the *Avaya Partner Contact Closure Adjunct Installation Instructions* leaflet to install the Contact Closure and connect the auxiliary devices, which the Contact Closure relays activate and deactivate.
2. Connect the Avaya Partner Contact Closure adjunct box to the CC port on the Branch Gateway front panel.

---

## 808A Emergency Transfer Panel and associated phone installations

The Emergency Transfer Relay (ETR) feature provides basic phone services in case of a system failure, such as a power outage or failed connection to the MGC. You can use the ETR feature in conjunction with an MM711, MM714, MM714B, or MM716 analog media module. The ETR panel provides up to five incoming Central Office (CO) trunk loops to 5 selected G450 Branch Gateway analog lines. One ETR panel supports up to five emergency lines. You can cascade a second ETR panel, providing support for up to 10 emergency analog phones.

ETR is activated automatically upon system failure by closing the tip or ring contacts between the analog lines and the analog trunks. When ETR is activated, all calls are directed by the analog relays between the outside lines and analog phones. A current-loop detection circuit prevents ongoing calls from disconnection when normal functioning resumes. If a call is in progress on an outside line when the connection is restored, the call continues. The trunk port and analog line port passing through the ETR panel do not operate until the active call ends.

For more information on installing the 808A Emergency Transfer Panel, see *808A Emergency Transfer Panel Installation Instructions*, 03-602518, which is provided with the Emergency Transfer Panel.

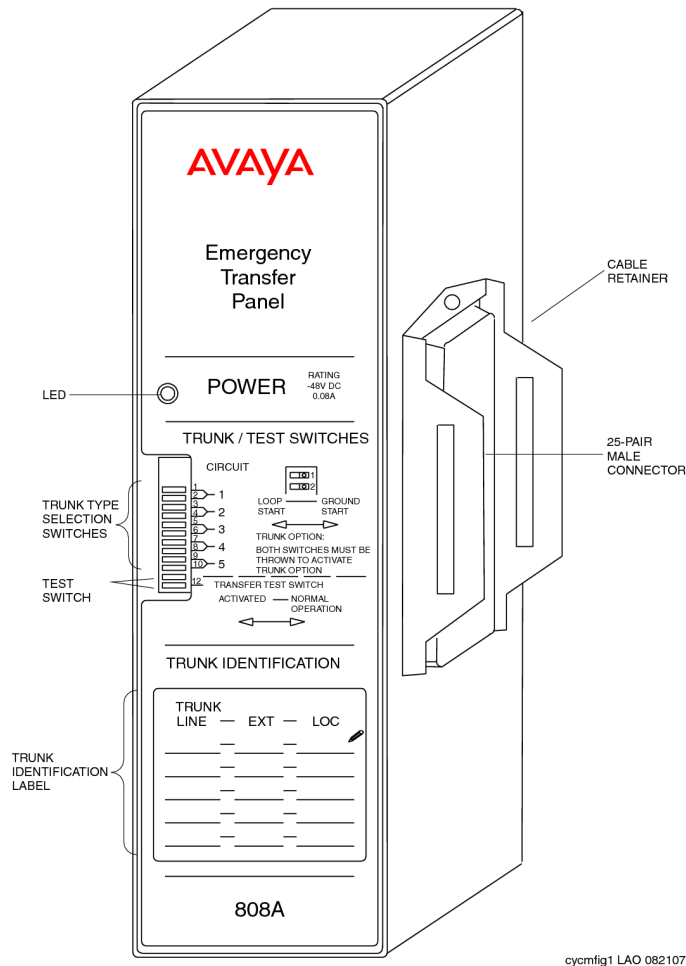


**Figure 15: Emergency Transfer Panel**

# Chapter 5: Branch Gateway configuration

The Branch Gateway requires software configuration. The Branch Gateway can be configured using the Avaya Branch Gateway Command Line Interface (CLI). The CLI is a comprehensive tool for configuring the gateway and includes all supported configuration tasks. For information about configuration by using the CLI, see *Administering Avaya G450 Branch Gateway*. For information about CLI commands, see *Avaya Branch Gateway G450 CLI Reference*.

The Branch Gateway can be accessed:

- At the customer site through a laptop connected to the Console (CNSL) port or Services (SVCS) port of the Branch Gateway.
- Remotely through the network. For information about preparing a newly installed Branch Gateway for configuration through the network, see [Configuring basic Branch Gateway connectivity](#) on page 55.
- From a remote location through a modem.

---

## Configuring basic Branch Gateway connectivity

### About this task

You can run an installation script on a newly installed Branch Gateway to configure the basic network parameters required to achieve network connectivity. A remote technician can then further configure the gateway as required. Note that the installation script does not require running any CLI command.

### Procedure

1. Prepare a laptop with SSH client software.
2. Set the laptop's TCP/IP properties as follows:
  - IP address: 192.11.13.5
  - Subnet mask: 255.255.255.252
  - Disable DNS service
  - Disable WINS Resolution
3. Connect the laptop to the Branch Gateway Services (SVCS) port using an Ethernet cable.
4. SSH to 192.11.13.6.

5. At the prompt, enter the default username: `root` and password: `root`
6. At the prompt, configure a new password.

Follow the password complexity rules while setting a new password. For password rules, see *Avaya Branch Gateway G450 CLI Reference*

7. At the **Enhanced Access Security Gateway (EASG)** prompt, read the following message:

```
*****
Enhanced Access Security Gateway (EASG) Confirmation.
*****
```

Please confirm whether Avaya is granted login access this system. You may change this setting any time after confirmation is completed.

Enable EASG: (Recommended)

By enabling Avaya Logins you are granting Avaya access to your system.

This is necessary to maximize the performance and value of you Avaya

support entitlements, allowing Avaya to resolve product issues in a timely manner.

In addition to enabling the Avaya Logins, this product should be registered with Avaya and technically onboarded for remote connectivity

and alarming. Please see the Avaya support site ([support.avaya.com/registration](http://support.avaya.com/registration)) for additional information for registering products and establishing remote access and alarming.

Disable EASG:

By disabling Avaya Logins you are preventing Avaya access to your system.

This is not recommended, as it impacts Avaya's ability to provide support

for the product. Unless the customer is well versed in managing the product themselves, Avaya Logins should not be disabled.

Enter 1 to Enable EASG (Recommended) or 2 to Disable EASG? 1

8. At the prompt, enter 1 or 2 to enable or disable EASG.

The following message is displayed:

Do you want to continue (Y/N)?

9. At the prompt, enter `Y` to continue.
10. At the prompt, enter `Y` to configure basic gateway connectivity.

If you enter `n`, you can use the **script-config** CLI command to run the installation script, as long as you have not saved any configuration changes you may have made.

If you need to configure the gateway in FIPS mode, enter `n` and run the command **set fips-mode enable**. The command will remove the existing configuration and resets the gateway. After the reset, repeat from step 4 above.

## 11. Configure the following parameters:

For each parameter, you can enter a value, or click **Enter** to accept the default value shown in square brackets:

- VLAN number
- IPv4 enabled or disabled
- Static IPv4 address
- IPv4 address for the primary management interface
- IPv4 Subnet mask for the primary management interface
- IPv4 address for the default gateway (router)
- IPv6 enabled or disabled
- IPv6 Unicast global address.
- IPv6 prefix length
- IPv6 Link local address
- IPv6 PMI (Global or Link Local)
- IPv6 Default gateway
- Up to eight IP addresses (four IPv4 and four IPv6) to specify the Media Gateway Controllers
- Hostname for the Branch Gateway

The settings you configured are displayed, and you are prompted for confirmation.

- If you confirm the settings, they are saved and the Branch Gateway reboots.
- If you do not confirm the settings, you are prompted to re-configure them. If you enter *y*, the parameters are presented again for configuration.

## 12. Connect the Ethernet port to the network to enable remote access to the Branch Gateway.

A remote technician can now further configure the Branch Gateway using the CLI.

For G450 v3, use Shielded Twisted Pair (STP) type CAT5e cables to connect to the jacks labeled "ETH WAN" or "ETH LAN" in countries that require EN55022/EN55032 compliance.

# Chapter 6: Post-installation verification

After the initial configuration, you must verify if the installation has been successful and remove the installation equipment.

---

## Installation testing

When the installation is complete, you must perform simple tests to verify telephone and data connectivity.

---

## Testing data connectivity

### About this task

Test data connectivity by pinging the IP address of each device to test the device's connectivity within the network and outside the network.

---

## Testing telephones

### Procedure

1. Make outgoing calls from the telephone.

Make sure you hear a dial tone when you pick up the receiver. Make sure you can make both an internal (within the local network) and an external (outside the local network) call.

2. Make a call to the telephone from both within the network and outside of the network.

---

## Testing trunks

### About this task

Use the facility test call feature to verify that each trunk is functioning properly.

For information about how to use the facility test call feature, see *Maintenance Commands for Avaya Aura® Communication Manager, Branch Gateways and Servers*.

## Testing LSP failover

### About this task

If you have an S8300 Server installed and configured as an LSP in the Branch Gateway, you need to perform a test to make sure that the LSP takes over control of the Branch Gateway if the Branch Gateway becomes disconnected from the primary MGCs (Media Gateway Controller).

#### **Note:**

If SLS mode is enabled and the primary controller and LSP fail, then the Branch Gateway enters SLS mode.

For more information about testing LSP failover, see “Auto Fallback for H.248 Gateways” in *Administering Network Connectivity on Avaya Aura® Communication Manager* and the Migrate H.248 MG to primary” screen command in *Avaya Aura® Communication Manager Screen Reference*.

### Procedure

1. Verify that valid translation are file synchronized to the LSP by logging into Avaya Aura® Communication Manager from the LSP and listing either stations or trunks, see *Administering Avaya Aura® Communication Manager*, 03-300509.

Verify that the list of stations or trunks is valid. If the files are not synchronized, verify that you have correctly configured the required IP addresses for the primary controllers) (MGC). If you are using Avaya IW to configure Branch Gateway, the following are the key actions that must be done in the wizard to ensure correct IP address configuration:

- a. On the Usage options screen, install an LSP that is associated with an S8300 server Primary Controller.

After you select the usage option, the Primary Controller IP Address screen appears and calls for the required addresses for your primary controller type. Configure the following IP address for each primary controller type:

| Primary media gateway controller | Number of IP addresses to be configured | IP addresses to configure                  |
|----------------------------------|-----------------------------------------|--------------------------------------------|
| S8300 server                     | 1                                       | The IP address of the primary S8300 server |

- b. On the Primary Controller IP Address screen, enter all the required IP addresses for the primary controller type.

There may be a delay after running Avaya IW until the LSP is registered with the primary MGC and the translations are file synchronized.

You must add the LSP server correctly to the Main Communication Manager server.

2. If valid translations are not file synchronized to the LSP, do the following:
  - a. From a SAT session running on the primary controller, verify that the LSP node-name and IP address are correctly entered.
  - b. Use the `save translation lsp` command to start the file synchronization process.
  - c. Log in again to Avaya Aura® Communication Manager from the LSP and list either stations or trunks.
  - d. Verify that the list of stations or trunks is valid.
3. Disconnect Branch Gateway from the primary controller, ensuring that all telephones are still connected or have network connectivity to the Branch Gateway.
4. Verify that you can make calls between local telephones using the outside lines connected locally to the Branch Gateway.

## Spectre and Meltdown vulnerability

G450 Branch Gateway is not vulnerable to the Spectre and Meltdown hardware issue.

For more information about Spectre and Meltdown fixes, see [PSN020346u](#) at Avaya Support site.

---

## IP addresses and controllers

The IP address of the Communication Manager's CLAN or the IP address of an Ethernet Port on the server on which Communication Manager is deployed which is used for processor Ethernet Connections.

## Supported servers

The following servers are supported for deployments and upgrades to Release 10.2.x and later:

- Avaya Solutions Platform S8300 for Communication Manager and Branch Session Manager
- Avaya Solutions Platform 130 Appliance: Dell PowerEdge R640

For fresh installations, use Avaya Solutions Platform 130 Appliance: Dell PowerEdge R640.

---

## Removing the installation equipment

### About this task

Remove all equipment that you used during the installation process. This may include the CD-ROM drive, the software upgrade CDs, the laptop computer, and the modem (for installations without an S8300 server module only).

# Chapter 7: Media module and device additions

When adding new devices to the Branch Gateway, consult your project manager for topology requirements for connections between specific ports and specific devices.

---

## Media module additions

Various media modules including voice modules or WAN modules can be added to the Branch Gateway.

### Voice module additions

You can hot-swap voice modules. This means that you can add or remove a voice module in the Branch Gateway while the system is running, without any disruption to your network. Configuration of the Branch Gateway is not necessary when you add or remove a voice module. Configuration is only necessary when you add telephones, fax machines, and trunks to the new module. See [Adding a telephone](#) on page 62 and [Adding a trunk](#) on page 63.

Some configuration of the Avaya Aura® Communication Manager is necessary when you install an MM710, MM710B, MM720, MM721, or MM722 media module. See *Administering Avaya Aura® Communication Manager*. Also, for an MM710, MM720, MM721, or MM722, it is usually advisable to set the media module as the synchronization source of the Branch Gateway. For information about setting the synchronization source of the Branch Gateway, see the *Avaya Branch Gateway G450 CLI Reference*.

### WAN module additions

You can hot-swap WAN modules. This means you can add or remove a WAN module in the Branch Gateway while the system is running, but the Branch Gateway resets when you add or remove the module. However, hot insertion and removal is not recommended in most cases. Because hot insertion or removal resets the Branch Gateway, any translation and other data that is in the running configuration but has not been saved to the startup configuration will be lost.

There is no configuration necessary when you add or remove a WAN module. Configuration is only necessary when you add WAN lines to the new module. See [Adding a WAN line](#) on page 64.

 **Note:**

WAN media modules are end-of-sale since 2010.

---

## Telephone additions

You must connect, configure and test the telephone before adding the telephone to the Branch Gateway.

## Telephone connections

To connect a new telephone, see the following sections:

- [Connecting an IP telephone](#) on page 42
- [Connecting an analog telephone](#) on page 44
- [Connecting a DCP telephone to an MM312, MM712, or MM717 media module](#) on page 45

## Configuration of telephones on Communication Manager

Standalone:

- Media gateway phones are configured on Avaya Aura® Communication Manager, see the *Administering Avaya Aura® Communication Manager* guide for more information.
- LSP: Configuration is done on the primary Communication Manager server.

For information about connecting a laptop to the Services (SVCS) port, see [Connecting a computer to the Services \(SVCS\) port](#). For information about preparing a modem, see Chapter 4: Connecting and enabling a modem for remote access. For information about configuration, see [Branch Gateway configuration](#) on page 55.

## Recording of telephone information for software configuration

When you add a new telephone - IP, DCP or Analog - note the following information for software configuration:

- Name and location of the owner of the telephone
- Model number of the telephone
- Extension of the telephone
- Slot and port number on the Branch Gateway to which the telephone connects - this does not apply to IP telephones.

## Testing the telephone

### Procedure

1. Make outgoing calls from the telephone.

Make sure you hear a dial tone when you pick up the receiver. Make sure you can make both an internal (within the local network) and an external (outside of the local network) call.

2. Make a call to the telephone from both within the network and outside of the network.

---

## Trunk additions

You must order, connect, configure, and test the trunk before adding the trunk to the Branch Gateway.

### Trunk ordering

- Make sure that the telephone service provider installs the trunk near the physical location of the Branch Gateway and verifies that the trunk is working properly before you contact the technician who is performing or supervising the configuration
- Note the telephone number of the trunk

### Special considerations when ordering an analog trunk

When you order an analog trunk, there are several recommendations depending on your system's particular needs:

- For optimal functioning of the MM714B Emergency Transfer Relay feature, it is recommended to use a loop-start trunk.
- For access to voice mail systems in the United States, it is recommended to use a ground start trunk to ensure that calls are properly disconnected when the outside caller disconnects.

Ground start trunks may be provided via the MM711, MM714B or MM714 media modules.

If you use the MM714B with ground start, you must use a ground start button for ETR.

- Request conditioned lines to ensure satisfactory voice quality and trunking interactions.

---

## Connecting the trunk

### Trunk configurations on Communication Manager

- Trunks on the media gateway are configured on Avaya Aura® Communication Manager, see the Communication Manager administration guide for more information.
- LSP: Configuration is done on the primary Communication Manager server.

 **Note:**

Sync timing configuration for a T1/E1 trunk is done through the CLI or the Communication Manager administration interface.

For information about connecting a laptop to the Services (SVCS) port, see [Connecting a computer to the Services port](#). For information about preparing a modem, see Chapter 4: [Connecting and enabling a modem for remote access](#). For information about configuration, see [Branch Gateway configuration](#) on page 55.

### Trunk information recordings for software configuration

When you add a new trunk, note the following information for software configuration:

- Slot and port number on the Branch Gateway to which the trunk connects
- Telephone number of the trunk

### Testing the trunk

#### Procedure

1. Make outgoing calls from the trunk.

Ask the technician that is performing or supervising the configuration for instructions how to access the trunk. Make sure you can make both an internal (within the local network) and an external (outside of the local network) call.

2. Make a call into the Branch Gateway trunk.

### WAN line additions

You must order, connect, configure and test the WAN line before adding the line to the Branch Gateway.

### WAN line ordering

If you need to order the WAN line, make sure that the service provider installs the line near the physical location of the Branch Gateway and verifies that the line is working before you configure the WAN on the Branch Gateway.

## WAN line connections

To connect a WAN line, see [Connecting to the Wide Area Network \(WAN\)](#) on page 50.

## WAN line configuration

Configuration of the WAN line is performed from the gateway CLI interface.

For information about connecting a laptop to the Services port, see [Connecting a server](#). For information about preparing a modem, see [Chapter 4: Connecting and enabling a modem for remote access](#) on page 49. For information about configuration, see [Branch Gateway configuration](#) on page 55.

## WAN information recordings for software configuration

When you add a new WAN line, note the following information for software configuration:

- Slot and port number on the Branch Gateway to which the WAN line connects

## Testing the WAN link

### About this task

After installation of the WAN line is complete, test the link by verifying that the SIG LED for the port to which the link connects is lit. It is also recommended that you ping the IP address of a device using the WAN line and perform a trace route test in order to test connectivity with the network and outside the network.

## Avaya Partner Contact Closure Adjunct additions

To install an Avaya Partner Contact Closure Adjunct, follow the instructions in [Installing the Avaya Partner Contact Closure Adjunct](#) on page 53.

# Chapter 8: Field Replaceable Unit upgrades and replacements

You can add or remove VoIP modules, the fan tray, or a power supply unit. You can add or replace a VoIP module, as well as add or remove components of the upgrade memory kit. Refer to Equipment list for ordering information.

 **Note:**

There are four hardware versions of G450, referred to as G450 v1 (1.x) to G450 v4 (4.x).

- On G450 1.x, the ASB button is to the right of the RST button.
- On G450 2.x and greater, the RST button is above the ASB button.

In cases where the instructions differ according to the G450 version, instructions are given for both versions.

---

## Branch Gateway main board modules

You can add or remove memory modules and VoIP modules in the Branch Gateway main board. To do so, you must pull out the Branch Gateway main board. The Branch Gateway supports hot insertion and removal of the main board without power drop. However, all services are suspended while the Branch Gateway main board is out, and all calls passing through the Branch Gateway are disconnected. Any translation and other data that is in the running configuration but has not been saved to the startup configuration is lost.

 **Electrostatic alert:**

Do not touch any components on the printed circuit board.

 **Electrostatic alert:**

Hold the module only by the edges to avoid damage from static electricity. Do not touch the top or bottom of the circuit board. If possible, wear a wrist strap and use an antistatic bag.

 **Caution:**

The connector pins can be bent or damaged if the module is handled roughly or if you misalign the module before forcing the module into position.

**\* Note:**

Consult your project manager before adding or removing memory or VoIP modules in the Branch Gateway.

## Removing and inserting the Branch Gateway main board

### Procedure

1. To remove the Branch Gateway main board:
  - a. Unscrew the two captive screws, one at each side of the Branch Gateway main board front panel.
  - b. Open the latches on both sides of the main board.
  - c. Grasp the latches and pull out the main board from its slot.
  - d. Place the main board carefully on a table.
2. To insert the Branch Gateway main board:
  - a. Open the latches on both sides of the slot.
  - b. Insert the Branch Gateway main board vertically into the slot.
  - c. Push the main board in until the latches begin to close.
  - d. Close and tighten the two captive screws on the front panel and then tighten the latches.
  - e. Use the `show platform mainboard` CLI command to make sure the Branch Gateway is working properly.

### Result



Figure 16: Removing and inserting the Branch Gateway main board

## Replacing the G450 main board

### Procedure

Perform a backup and restore when replacing the G450 main board.

For more information, see Chapter 12: Branch Gateway backups and restores.

## Inserting or replacing a RAM card in the G450

### About this task

There are four hardware versions of the G450, referred to as G450 1.x, G450 2.x, G450 3.x and G450 4.x. The version of the G450 is printed on the label displayed on the rear of the G450 chassis.

In cases where the instructions differ depending on the G450 version, instructions are given for both versions.

RAM cards are not supported for G450 4.x.

### **Warning:**

Do not insert an additional RAM card into the second slot on the G450 2.x.

The G450 has two RAM slots. The basic configuration includes one 256 MB RAM card.

The slots are located on the G450 main board. You must pull out the main board to remove or insert a memory card. The G450 supports hot insertion and removal of the main board without power drop. However, all services are suspended while the G450 main board is out, and all calls passing through the gateway are disconnected. Any translation and other data that is in the running configuration but has not been saved to the startup configuration is lost.

To increase RAM memory in the gateway:

- In the G450 1.x, replace the 256 MB RAM card with the 512 MB RAM card provided in the kit.
- In the G450 2.x and 3.x versions, remove the RAM card from the main board and replace it with the 512 MB RAM card provided in the kit.

### Procedure

1. Remove the G450 main board. See [Removing and inserting the Branch Gateway main board](#) on page 67.
2. Upgrade RAM memory:
  - For G450 1.x, see [Replacing a G450 1.x RAM card](#) on page 68.
  - For G450 2.x and 3.x, see [Replacing the G450 2.x and 3x RAM cards](#) on page 69.
3. Reinsert the G450 main board. See [Removing and inserting the Branch Gateway main board](#) on page 67.

## Replacing a G450 1.x RAM card

### About this task

### **Electrostatic alert:**

Hold the module only by the edges to avoid damage from static electricity. Do not touch the top or bottom of the circuit board. If possible, wear a wrist strap and use an antistatic bag.

** Caution:**

The connector pins can be bent or damaged if the module is handled roughly or if you misalign the module before forcing the module into position.

**Procedure**

1. Locate the RAM slot and open the latches on both its sides.

The RAM card lifts up.

2. Pull out the 256 MB RAM card.
3. Insert the 512 MB RAM card provided in the kit into the RAM slot and push down, until the two latches on either side of the card lock into place.

## Replacing the G450 2.x and 3x RAM cards

**About this task**

Insert the RAM card into the first RAM slot (SODIMM A) *only*.

The G450 v4 does not require adding or replacing a RAM memory card.

** Electrostatic alert:**

Hold the module only by the edges to avoid damage from static electricity. Do not touch the top or bottom of the circuit board. If possible, wear a wrist strap and use an antistatic bag.

**Procedure**

1. Locate the RAM slot holding the RAM card, as shown in the figure.
2. Open the latches on both sides of the RAM slot. The RAM card comes out.
3. Pull out the 256 MB RAM card.

** Important:**

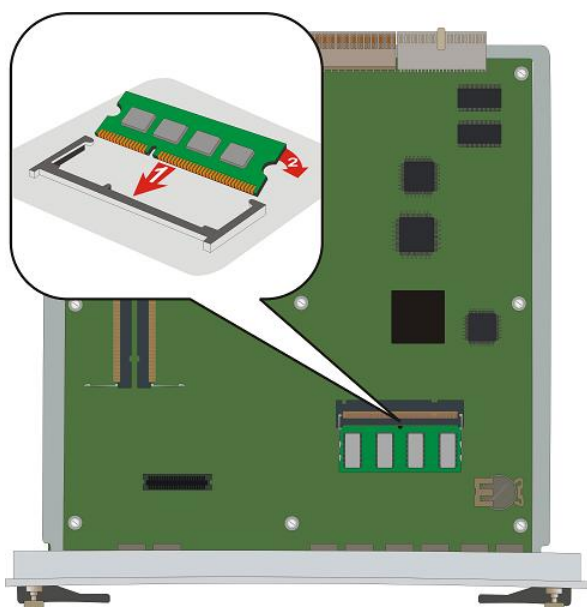
Remove the RAM card in SODIMM slot A. You can only replace the RAM card in SODIMM slot A, you cannot add an extra card in SODIMM slot B.

4. Insert the 512 MB RAM card provided in the kit, or a replacement 256 MB RAM card into the RAM slot, and push in all the way.

** Warning:**

Do not use too much force.

5. Flatten the RAM card so it is flush with the main board.



## Adding or removing VoIP modules: MP20 and MP80

### About this task

The G450 main board has four slots for VoIP engines. Each slot can accommodate either a Media Processor 20 (MP20) module or a Media Processor 80 (MP80) module. An MP20 provides 25 channels for G.711 and G.726 and 20 channels for G.729. An MP80 provides 80 channels.

The G450 supports a maximum of 320 active channels. Therefore, any combination of MP80 and MP20 in the four DSP slots can be supported.

The G450 prior to release 5.2.1 supports up to 240 channels. G450 v4 (4..x) does not support MP20 and MP80 VoIP modules.

### **Electrostatic alert:**

Hold the modules only by the edges to avoid damage from static electricity. Do not touch the top or bottom of the circuit board. Wear an antistatic wrist ground strap when you handle module components. Connect the strap to an approved ground, such as an unpainted metal surface. Use an antistatic bag.

### **Caution:**

The connector pins can get bent or damaged if you handle the module roughly or misalign the module before forcing the module into position.

There is no configuration necessary when you install an MP20 or MP80 module.

### Procedure

1. To insert an MP20 or MP80 module:
  - a. Locate the MP20 or MP80 module slot.

The location differs depending on the hardware version of the G450 (see [the figure](#) on page 71 and [the figure](#) on page 72).

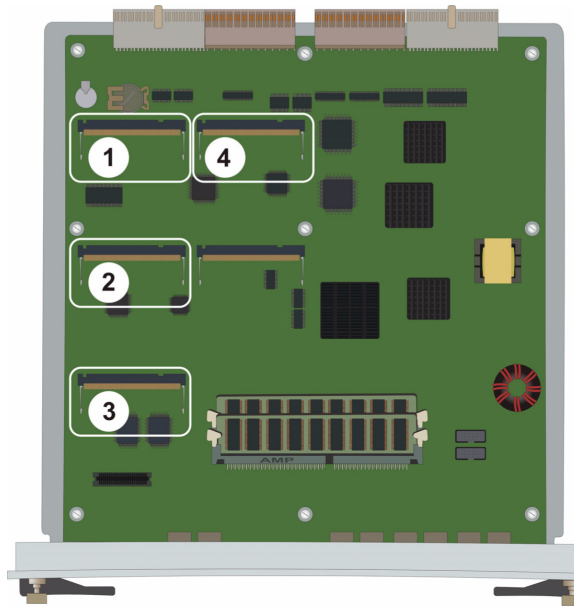


**Figure 17: Location of MP20 and MP80 module slots in a G450 1.x**

**Table 1: Figure notes:**

|   |                          |
|---|--------------------------|
| 1 | MP20 or MP80 module slot |
| 2 | MP20 or MP80 module slot |
| 3 | MP20 or MP80 module slot |
| 4 | MP20 or MP80 module slot |

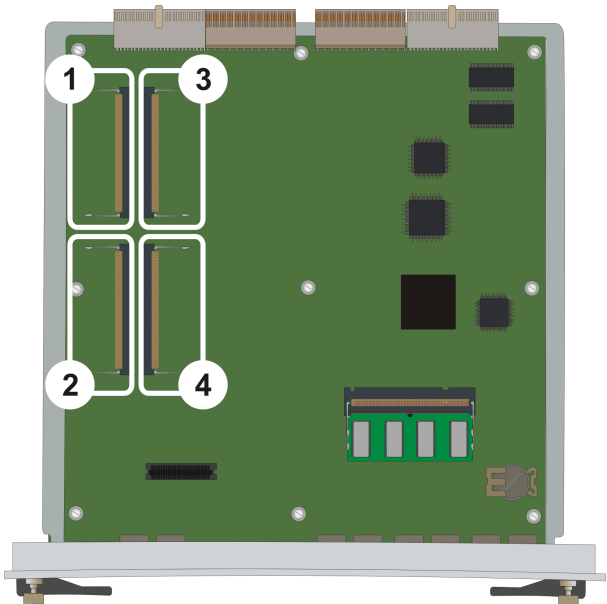


Figure 18: Location of MP20 and MP80 module slots in a G450 2.x

Table 2: Figure notes:

|   |                          |
|---|--------------------------|
| 1 | MP20 or MP80 module slot |
| 2 | MP20 or MP80 module slot |
| 3 | MP20 or MP80 module slot |
| 4 | MP20 or MP80 module slot |

- b. Position the MP20 or MP80 module at a 45-degree angle to the main board, and start inserting it into an MP20 or MP80 slot (see [the figure](#) on page 73 and [the figure](#) on page 73).

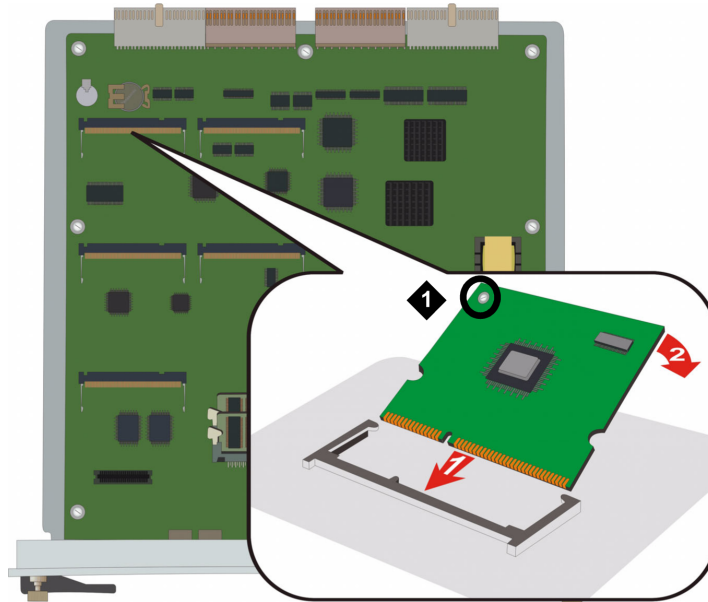


**Figure 19: Adding or removing an MP20 or MP80 module in a G450 1.x**

**Table 3: Figure notes:**

|   |                           |
|---|---------------------------|
| 1 | VoIP module locking screw |
|---|---------------------------|

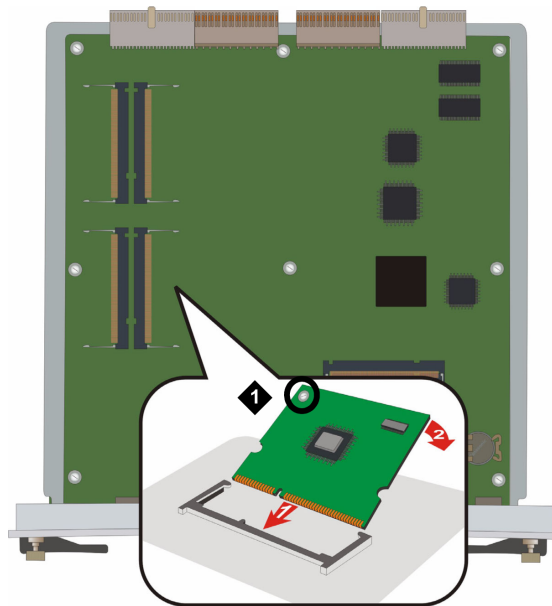


**Figure 20: Adding or removing an MP20 or MP80 module in a G450 2.x or 3.x**

**Table 4: Figure notes:**

|   |                           |
|---|---------------------------|
| 1 | VoIP module locking screw |
|---|---------------------------|

- c. Push the module in all the way. Do not use too much force.

- d. Flatten the module, so it is flush with the main board.  
The latches at both sides click shut.
  - e. Tighten the locking screw affixed to the VoIP module.  
This secures the VoIP module to the motherboard.
  - f. After powering up, use the **show platform mainboard** CLI command to make sure everything is OK.
2. To remove an MP20 or MP80 module:
    - a. Unscrew the locking screw attaching the VoIP module to the motherboard (see [the figure](#) on page 73 and [the figure](#) on page 73).
    - b. Open the latches on both sides of the module slot.  
The module lifts up.
    - c. Pull out the module.  
Touch the module only at the edges.

## Adding and removing MP160

### About this task

The G450 main board has four slots for VoIP engines. You can install up to two Media Processor 160s (MP160). An MP160 provides 160 channels for voice transport. Alternatively, if no standard voice is required, a maximum of 120 V.150.1 call traffic channels are supported. A combination of voice calls and V.150.1 calls are supported per the Avaya configuration guidelines.

#### \* Note:

G450 supports up to 320 active channels for voice transport. You can install up to two MP160 modules, or a combination of Media Processor modules for voice transport, for example, one MP160 and two MP80s.

The following table lists the permitted combinations of Media Processor modules for the G450:

| Combination of cards        | MP20   | MP80   | MP160  |
|-----------------------------|--------|--------|--------|
| Combination #1 <sup>1</sup> | -      | -      | 1 or 2 |
| Combination #2              | 1 or 2 | -      | 1      |
| Combination #3              | -      | 1 or 2 | 1      |
| Combination #4              | 1      | 1      | 1      |

#### \* Note:

1. G450 v4 supports only Combination # 1.

#### ! Important:

You can only install an MP160 in slots 2 and 4 on the G450 v1 (1.x) or slots 1 and 2 on the G450 v2, v3, v4 (2.x, 3.x, and 4.x). (See [Figure 22: Location of DSP module slots in a G450 1.x](#) on page 76 and [Figure 23: Location of DSP module slots in a G450 2.x, 3.x, and 4.x](#) on

page 77). On the G450 1.x, the ASB button is to the *right* of the RST button. On the G450 2.x and newer, the RST button is *above* the ASB button.

You can also use the `show system` CLI command to identify the main board HW version.

#### **Electrostatic alert:**

Hold the modules only by the edges to avoid damage from static electricity. Do not touch the top or bottom of the circuit board. Wear an antistatic wrist ground strap when you handle module components. Connect the strap to an approved ground, such as an unpainted metal surface. Use an antistatic bag.

#### **Caution:**

The connector pins can get bent or damaged if you handle the module roughly or misalign the module before forcing the module into position.

Attach the correct standoff according to the hardware version of the G450. Using the wrong standoff prevents you from installing the MP160 correctly.

### **Before you begin**

You do not need to configure the G450 when installing an MP160. However, you must configure V.150.1 in Communication Manager to support V.150.1 applications such as modem-over-ip. To configure V.150.1, see *Configuring V.150.1 on the Avaya G450 Branch Gateway*.

### **Procedure**

1. Insert the provided plastic standoff in the hole, see [Figure 21: Location of Standoff on MP160](#) on page 75

The standoff type differs depending on the hardware version of the G450. Ensure you use the correct standoff.

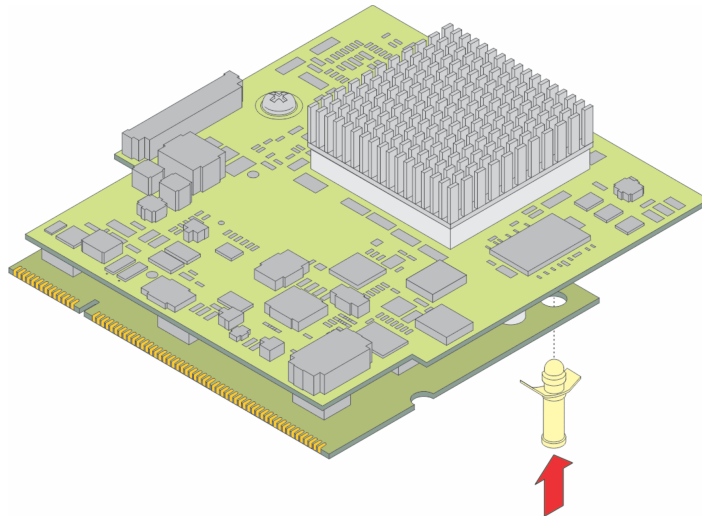


**Figure 21: Location of Standoff on MP160**

- Use the *short* standoff for G450 1.x.
- Use the *long* standoff for G450 2.x and 3.x.

- Remove standoffs and lower the board for G450 4.x.

**\* Note:**

The current MP 160 ships with long standoffs.

2. Locate the MP160 module slot. The location differs depending on the hardware version of the G450, see [Figure 22: Location of DSP module slots in a G450 1.x](#) on page 76 and [Figure 23: Location of DSP module slots in a G450 2.x, 3.x, and 4.x](#) on page 77.

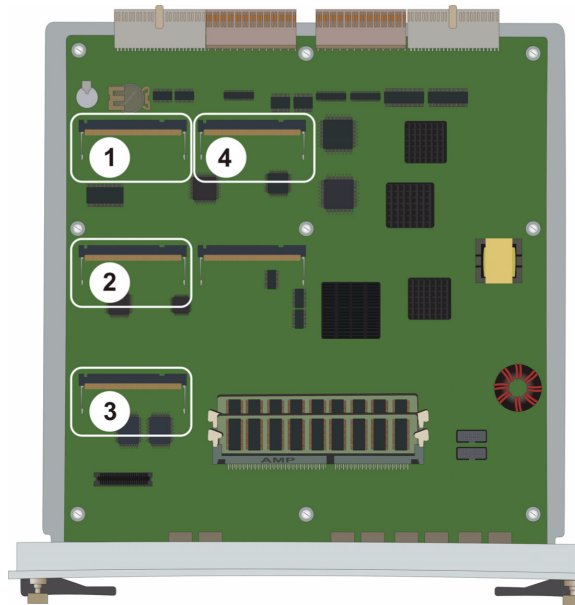


**Figure 22: Location of DSP module slots in a G450 1.x**

**Table 5: Figure notes:**

1. MP20 or MP80 module slot
2. MP20, MP80, or MP160 module slot
3. MP20 or MP80 module slot
4. MP20, MP80, or MP160 module slot

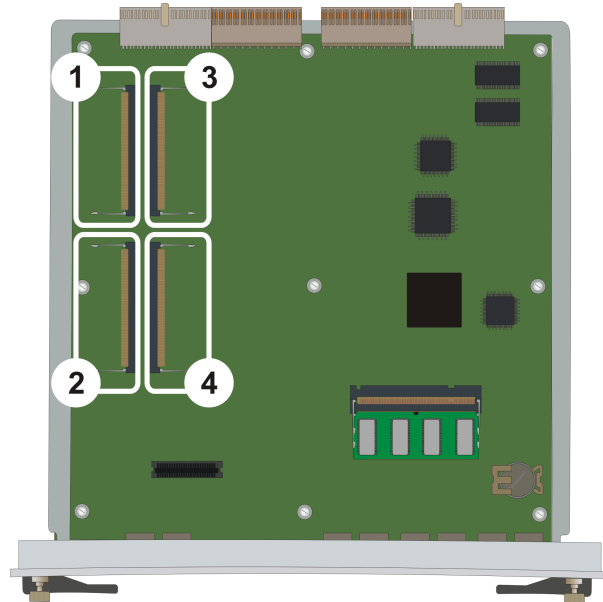


**Figure 23: Location of DSP module slots in a G450 2.x, 3.x, and 4.x**

**Table 6: Figure notes:**

1. MP20, MP80, or MP160 module slot
  2. MP20, MP80, or MP160 module slot
  3. MP20 or MP80 module slot
  4. MP20 or MP80 module slot
3. To insert the module into the slot, position the module at a 45-degree angle to the main board.

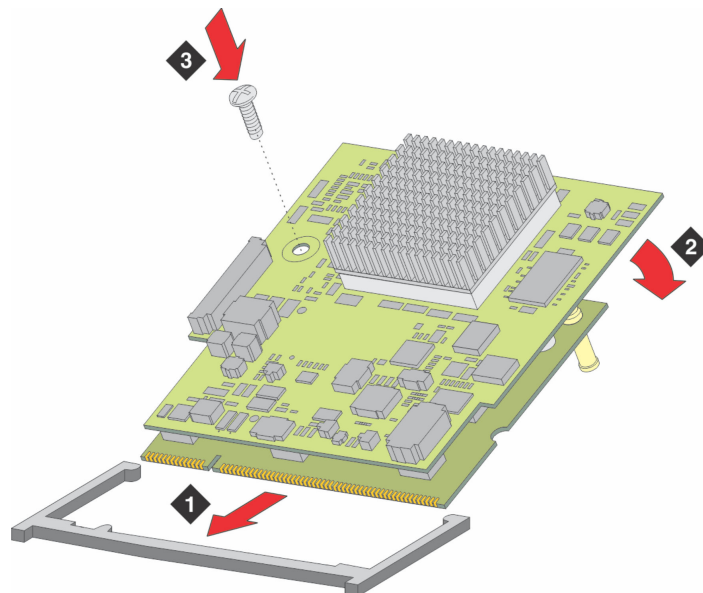


**Figure 24: Adding or removing an MP160 in a G450**

4. Push the module in all the way. Do not use too much force.
5. Flatten the module to flush with the main board.

The latches at both sides click shut.

6. Insert the M3 X 5 screw provided with the kit.
7. Tighten the screw to secure the VoIP module to the motherboard.

To install MP160 in G450 v4, do the following:

8. Remove the two screws from the MP160 module and separate the lower board from the upper board.

The lower board and the two screws are not required for installation on G450 v4.

9. Plug the MP160 upper board into the module slot 1 or module slot 2 location.
10. Secure the MP160 upper board to the main board with the two M2 X 10 mm screws from the kit. Fasten the screws to the metal standoffs.

The MP160 is now installed in the G450 v4.

### Next steps

After powering up, use the `show platform mainboard` CLI command to verify the installation.

## Compact flash memory cards

The Branch Gateway supports hot insertion and removal of a compact flash memory card without power drop, provided the compact flash is not in use when it is removed.

## Inserting a compact flash memory card

### Procedure

1. Remove the blank-plate covering the compact flash memory card slot, located in the center of the main board.
2. Position the compact flash (CMPCT FLSH) memory card so that the vendor name faces up and the connector points toward the Branch Gateway, and gently insert it into the compact flash slot.

After installing the compact flash memory card and the additional 256 MB RAM card (for the G450 v1, v2, v3), the announcement files are not automatically moved from the internal flash to the compact flash.

3. To move the announcement files:
  - a. Make sure the Branch Gateway is registered with the Communication Manager.
  - b. On the change media-gateway screen of the Communication Manager SAT interface, set *enable CF* to *y*.
  - c. On the Communication Manager SAT interface, enter `enable announcement-board`.

- d. The announcement files are copied from internal flash to the compact flash, and the compact flash's yellow CARD IN USE (CF BSY) LED flashes.
4. Use the **show platform mainboard** CLI command to verify that everything is OK.

In the command output, the lower RAM slot is referred to as Memory socket #1, and the upper RAM slot is Memory socket #2.

- A G450 1.x with increased memory displays, for example:

```
MEMORY SOCKET #1
-----
Type           : 512MB DDR SDRAM memory module with ECC
Serial Number   : 749f5c9f
Manufacture Part Num : MT9VDDT6472AY-40BJ1
Faults          : No Fault Messages

MEMORY SOCKET #2
-----
Type           : UNKNOWN
Serial Number   : UNKNOWN
Manufacture Part Num : UNKNOWN
Faults          : UNKNOWN
```

- A G450 2.x or 3.x with increased memory displays, for example:

```
MEMORY SOCKET #1
-----
Type           : 512MB DDR SDRAM memory module
Serial Number   : 0550749f
Manufacture Part Num : 9VDDT3272AY-335G4
Faults          : No Fault Messages

MEMORY SOCKET #2
-----
Type           : UNKNOWN
Serial Number   : UNKNOWN
Manufacture Part Num : UNKNOWN
Faults          : UNKNOWN
```

**\* Note:**

A G450 v4 (4.x) does not use SODIMM memory so the memory information is not displayed in 'show platform mainboard'.

## Compact flash memory card removals

After installing a compact flash memory card, you may decide to remove it for one of several reasons. The following sections provide instructions for safe removal of a compact flash memory card in each possible scenario.

- [Replacing a compact flash memory card with a different compact flash memory card](#) on page 80 holding a different set of announcements
- [Replacing a compact flash memory card while retaining The current announcements](#) on page 80. You may want to do this because the current compact flash memory card failed, or you want to have two copies of the announcement files, or you want to use a faster compact flash card.

- [Downgrading from a compact flash to internal flash memory](#) on page 81

## Swapping compact flash memory cards

### Procedure

1. At the SAT interface of the Communication Manager, enter **disable announcement-board**.



#### Important:

If you do not enter the SAT command **disable announcement-board**, then, when you insert the new compact flash, its contents will be overwritten by the contents of the old compact flash.

2. Make sure the yellow CARD IN USE (CF BSY) LED associated with the compact flash is not flashing.



#### Warning:

If a compact flash is removed while it is in use, the announcement files on the compact flash may become corrupted and the Branch Gateway may reset, causing all announcement files in the RAM to be lost.

3. Remove the compact flash memory card.
4. Insert the new compact flash memory card into the compact flash (CMPCT FLSH) slot.
5. At the SAT interface of the Communication Manager, enter **enable announcement-board**.

## Replacing a compact flash memory card while retaining the current announcements

### Procedure

1. Make sure the yellow CARD IN USE (CF BSY) LED associated with the compact flash is not flashing.



#### Important:

If a compact flash is removed while it is in use, the announcement files on the compact flash may become corrupted and the Branch Gateway may reset, causing all announcement files in the RAM to be lost.

2. Remove the compact flash memory card.
3. Insert the new compact flash memory card into the compact flash slot.

The announcement files of the old compact flash are written to the new compact flash.

## Downgrading from a compact flash to internal flash memory

### About this task

You can downgrade from using up to 1024 announcements on a compact flash to using up to 256 announcements on the internal flash.

#### Important:

The internal flash can only store up to 256 announcement files, totaling no more than 45 minutes.

### Procedure

1. Backup the announcements from the compact flash to a USB device by entering the CLI command **backup config usb usb-devicebackup-name announcements-compact-flash**.

If you have only a few announcement files, you can use the CLI command **copy announcement-file usb** to copy them one by one.

2. At the SAT interface of the Communication Manager, enter **disable announcement-board**, and then set **enable CF** to **n** on the change media-gateway screen.

#### Important:

Ensure the yellow CARD IN USE (CF BSY) LED associated with the compact flash is not flashing.

If a compact flash is removed while it is in use, the announcement files on the compact flash may become corrupted and the Branch Gateway may reset, causing all announcement files in the RAM to be lost.

3. Remove the compact flash memory card.
4. Optionally replace the 512 MB RAM card with the 256 MB RAM card.
5. At the SAT interface of the Communication Manager, enter **enable announcement-board**.
6. Make sure there are no more than 256 announcement files in the backup.  
If the number of announcement files exceeds 256, manually delete as many as necessary in the backup directory.
7. Restore the announcements from the USB device to internal flash by entering the CLI command **restore usb usb-devicebackup-name announcements-internal-flash**.

#### Note:

In FIPS mode, identity certificates are not backed-up nor restored to the USB device and must be downloaded again after the restore operation. In FIPS mode backup performed on the same gateway can be restored but backup performed on non-FIPS mode cannot.

If you copy the announcement files one by one, you can restore them using the CLI command `copy ftp announcement-file`.

8. Attach the blank plate with screws to cover the compact flash (CMPCT FLSH) slot.

---

## Replacing the fan tray

### About this task

The fan system is field replaceable. It is mounted on a fan tray that can be replaced as one unit.

Branch Gateway supports hot swap of the fan tray. There is no need to power down or reset the Branch Gateway when replacing a faulty fan tray unit.

### ! Important:

Replace the fan tray within one minute, to avoid overheating of the Branch Gateway. If the Branch Gateway exceeds its allowed heat level, it shuts down.

If you remove and replace the fan tray, do not remove it again before waiting at least five minutes.

### Procedure

1. Prepare the new fan tray for insertion before removing the current fan tray. Take the new fan tray out of its package and place it nearby.



**Figure 25: Replacing the fan tray**

2. To remove the fan tray, do the following:
  - a. Unscrew the two captive screws on the front panel of the fan tray.
  - b. Grasp the screws and pull the fan tray out of its slot.
3. To insert the fan tray, do the following:
  - a. Insert the fan tray all the way into the slot.
  - b. Close and tighten the two captive screws on the front panel.

The fans start operating immediately.
  - c. Wait one minute and then use the `show platform fans` command to ensure Branch Gateway has discovered the fan.

# Replacing a power supply unit

## About this task

The Branch Gateway provides full redundant, load sharing power supply units (1 + 1). A single power supply unit provides enough power for any Branch Gateway configuration. If you choose to install two power supply units, the units operate in a load sharing mode.

The Branch Gateway supports hot swap of the power supply unit. Even if you have only one PSU unit installed, there is no need to turn off or reset the Branch Gateway when replacing a faulty power unit. You can install the replacement PSU in the second PWR slot, and it becomes the active PSU once you remove the faulty PSU.



Figure 26: Replacing a power supply unit

## Procedure

1. To remove a power supply unit:
  - a. Disconnect the Branch Gateway power cable from the mains socket.
  - b. Disconnect the Branch Gateway power cable from the power connector, on the front panel of the power supply unit, at the rear of the Branch Gateway.
  - c. Loosen the two captive screws, one on each side of the power supply unit.
  - d. Grasp the two side handles and pull the power supply unit out of the slot.
2. To insert a power supply unit:
  - a. Position the power supply unit before the opening and engage both sides of the unit in the interior guides.
  - b. Slide the power supply unit slowly into the chassis, maintaining an even pressure to assure that the unit does not become twisted or disengaged from the guides.
  - c. Insert and tighten the two captive screws on the front panel.
  - d. Connect the power cable to the power connector on the power supply unit.
  - e. Plug the power cable into a mains socket.
  - f. After turning on, use the **show platform power** CLI command to ensure everything is OK.

The upper PSU is referred to as PSU #1 in the CLI, and the lower PSU is PSU #2.

# Chapter 9: Avaya Aura® Communication Manager upgrades

For information about deploying the Communication Manager OVA on the Avaya Aura® provided server using Avaya Aura® System Manager Solution Deployment Manager, see *Deploying Avaya Aura® Communication Manager in Virtual Appliance*.

---

## Software upgrades using a CD-ROM drive

The upgrade software is usually installed from a CD-ROM drive connected to the S8300. If the upgrade is performed locally, you might need to provide a laptop and a USB CD-ROM drive. If the upgrade is performed from a remote location, you must connect a USB CD-ROM drive to the S8300 and insert the upgrade CD-ROM in the CD-ROM drive.

---

## S8300 upgrade with Solution Deployment Manager

From Release 7.0, you can upgrade S8300 using Solution Deployment Manager. For more information about upgrading S8300 firmware using Solution Deployment Manager, see *Administering Avaya Aura® System Manager*.

# Chapter 10: Branch Gateway firmware upgrade

The software that is used to control the Branch Gateway and the media modules installed on the Branch Gateway is called firmware. You can upgrade the firmware on Branch Gateway and media modules using various tools, each suitable for specific type of installation.

## Important:

You can upgrade to Release 10.1 Build 42.4.0 and later from Build 38.20.0 or earlier only after installing Release 7.1.0.5 Build 38.21.3. If you download Release 10.2 prior installing the Release 7.1.0.2 and run the **show download software status 10** command, the system displays the following error message:

```
Incompatible software image for this type of device.
```

After installing Release 7.1.0.2, you must enable or disable Avaya Logins before downloading Release 10.2 through CLI or SNMP.

You can enable or disable Avaya Logins by using one of the following options:

1. Use one of the following commands.
  - a. **login authentication services**: To enable Avaya Logins.
  - b. **no login authentication services**: To disable Avaya Logins.
2. Confirm that Avaya Logins can be enabled or disabled during firmware download. If the confirmation was not completed previously, you can confirm this when you download the software using one of the following commands:
  - a. **copy ftp SW\_imageA**
  - b. **copy ftp SW\_imageB**
  - c. **copy scp SW\_imageA**
  - d. **copy scp SW\_imageB**
  - e. **copy tftp SW\_imageA**
  - f. **copy tftp SW\_imageB**
  - g. **copy usb SW\_imageA**
  - h. **copy usb SW\_imageB**
  - i. **copy https SW\_imageA**

- j. `copy https SW_imageB`
- k. `copyedge scp SW_imageA`
- l. `copyedge scp SW_imageB`

If you upgrade Branch Gateway from Release 7.1.0.x Build 38.21.x to Release 7.1.2 Build 39.xx or later (Build 40.xx) the system will prompt to enable or disable EASG.

**\* Note:**

In Release 7.1 or later, the gateway defaults to using TLS 1.2, PTLS, and unencrypted H.248 communication with CM. Use the `set link-encryption` command to adjust these settings.

---

## Firmware upgrades using Solution Deployment Manager

You can use Solution Deployment Manager to view your network inventory and the firmware vintages of devices on your network. Solution Deployment Manager can also check the software versions currently in use against the latest versions available from Avaya and recommend updates when a newer version is available. Based on this information, you can download new firmware to multiple network devices simultaneously from a single management station, ensuring all devices are updated.

By using Solution Deployment Manager, you can update the software on your devices.

For information about using Solution Deployment Manager, see *Administering Avaya Aura® System Manager*.

**\* Note:**

You cannot upgrade G450 v4 using Solution Deployment Manager.

---

## Firmware upgrades from the primary controller

For a Branch Gateway without an S8300 server or for a Branch Gateway with an S8300 server installed as an LSP, you can upgrade the Branch Gateway firmware from the remotely located primary controller. The primary controller may be an S8300 server. For more details about upgrading firmware from the primary controller, see *Upgrading, Migrating, and Converting Avaya Servers and Gateways*, 03-300412.

**\* Note:**

You can only upgrade using FTP on the S8300 server.

# Upgrading firmware using the command line interface through SCP/FTP/TFTP/HTTPS

## About this task

You can upgrade firmware through SCP/FTP/TFTP/HTTPS using the CLI. You can perform the upgrade remotely using a modem connection, but the upgrade files must first be downloaded to an SCP, FTP, TFTP, or HTTPS server on the LAN connected to Branch Gateway.

## Procedure

1. Prepare installation worksheets.

See [Preparing installation worksheets](#) on page 89.

2. Set up an SCP, FTP, TFTP, or HTTPS server on the LAN connected to the Branch Gateway.

For information about setting up a file server, see [Setting up a TFTP server](#) on page 89.

If you use an FTP server, the Branch Gateway prompts you for a username and password when you enter a command to transfer a file.

3. Download the firmware files to the SCP, FTP, TFTP, or HTTPS server.

For more information, see [Downloading Branch Gateway firmware files to a local file server](#) on page 90.

4. Run the required CLI commands.

## CLI commands for upgrading Branch Gateway firmware via SCP/FTP/TFTP/HTTPS

You can use CLI commands to upload an upgrade file to Branch Gateway. For each of these commands, include the full path of the file and the IP address of the SCP, FTP, TFTP, or HTTPS host as parameters. You must use the specific path to the file on the SCP, FTP, TFTP or HTTPS server according to the home directory of the service (SCP, FTP, TFTP or HTTPS) that you are using. When you enter the command, the CLI prompts you for a username and password.

- Use the **copy ftp module** command, followed by the module number of the module you want to upgrade, to upgrade the firmware on a media module from an FTP server.
- Use the **copy ftp SW\_imageA** command to upgrade the Branch Gateway firmware into Bank A from an FTP server.
- Use the **copy ftp SW\_imageB** command to upgrade the Branch Gateway firmware into Bank B from an FTP server.
- Use the **copy tftp module** command, followed by the module number of the module you want to upgrade, to upgrade the firmware on a media module from a TFTP server.
- Use the **copy tftp SW\_imageA** command to upgrade the Branch Gateway firmware into Bank A from a TFTP server.
- Use the **copy tftp SW\_imageB** command to upgrade the Branch Gateway firmware into Bank B from a TFTP server.

- Use the **copy scp module** command, followed by the module number of the module you want to upgrade, to upgrade the firmware on a media module from an SCP server.
- Use the **copy scp SW\_imageA** command to upgrade the Branch Gateway firmware into Bank A from an SCP server.
- Use the **copy scp SW\_imageB** command to upgrade the Branch Gateway firmware into Bank B from an SCP server.
- Use the **copy https module** command, followed by the module number of the module you want to upgrade, to upgrade the firmware on a media module from an HTTP or HTTPS server.
- Use the **copy https SW\_imageA** command to upgrade the Branch Gateway firmware into Bank A from an HTTP or HTTPS server.
- Use the **copy https SW\_imageB** command to upgrade the Branch Gateway firmware into Bank B from an HTTP or HTTPS server.
- Use the **copyedge scp module** command, followed by the module number of the module you want to upgrade, to upgrade the firmware on a media module from an SCP server via Avaya SBC tunnel.
- Use the **copyedge scp SW\_imageA** command to upgrade the Branch Gateway firmware into Bank A from an SCP server via Avaya SBC tunnel.
- Use the **copyedge scp SW\_imageB** command to upgrade the Branch Gateway firmware into Bank B from an SCP server via Avaya SBC tunnel.

 **Note:**

The firmware image for G450 v1, v2, and v3 is `g450_sw_42_4_0.bin`.

The firmware image for G450 v4 is different than that of G450 v1, v2, v3:  
`g450v4_sw_42_4_0.bin`.

## Example upgrade via SCP/FTP/TFTP/HTTPS using the CLI

To upgrade the firmware of an MM712 media module in slot 3 from a TFTP server with the IP address `192.1.1.10`, where the home directory is `c:\home\ftp\` and the upgrade file is located in the directory `c:\home\ftp\version`, use the following command:

```
copy tftp module \version\mm712v51.fdl 192.1.1.10 3
```

The following example downloads a firmware version with the path and file name `C:\g450_sw_42_4_0.bin.net` from an FTP server with the IP address `149.49.134.153` to Bank A of the Branch Gateway:

```
copy scp SW_imageA C:\g450_sw_42_4_0.bin 149.49.134.153
```

The firmware image for the G450 v4 is different than that of G450 v1, v2, v3:

```
copy ftp SW_imageA C:\g450v4_sw_42_4_0.bin 149.49.134.153
```

**\* Note:**

The above specified path is the FTP server directory. Set the boot bank location for the new firmware as per your customized configuration, and reboot the gateway.

See *Avaya Branch Gateway G450 CLI Reference* guide for a list of all commands for the gateway.

## Installation worksheets

Before you perform the upgrade, you must enter the names of the target software and firmware versions that you need to install in the software and firmware upgrade worksheet. If you will need to set up a SCP, FTP, TFTP or HTTPS server, you also need to plan the SCP, FTP, TFTP or HTTPS server IP address, login, and password.

## Server Values worksheet

**Table 7: Software and firmware upgrade file names**

| Items for Upgrading                                                 | New file name for target |
|---------------------------------------------------------------------|--------------------------|
| File for LSP and primary controller (not used for individual files) |                          |
| Branch Gateway Processor                                            |                          |
| Branch Gateway Device Manager                                       |                          |
| MM710 E1/T1 media module                                            |                          |
| MM710B E1/T1 media module                                           |                          |
| MM711 Analog Port media module                                      |                          |
| MM712 DCP media module                                              |                          |
| MM714 Analog Port/Trunk media module                                |                          |
| MM714B Analog Port/Trunk media module                               |                          |
| MM716 Analog Port/Trunk media module                                |                          |
| MM717 24-port DCP media module                                      |                          |
| MM720 BRI media module                                              |                          |
| MM721 BRI media module                                              |                          |
| MM722 BRI Trunk media module                                        |                          |

## File server setup

To load single firmware files on a Branch Gateway, you must put the files on a computer connected to the customer's LAN in the customer's network. You log on to the Branch Gateway later and use the gateway's SCP, FTP, TFTP or HTTPS capability to download the new firmware. Set up a SCP, FTP, TFTP or HTTPS server on the LAN.

**\* Note:**

Use a Linux or Unix SCP, FTP, TFTP or HTTPS server only if a Linux or Unix SCP, FTP, TFTP or HTTPS server already exists on the local network. In this case, download the appropriate files to your laptop and give it to the customer for proper placement and execution.

## Downloading Branch Gateway firmware files to a local file server

### Procedure

1. Go to the [Avaya support](#) website.
2. Navigate to Media Gateway downloads.
3. Locate the file names that match the files listed in your installation worksheet.

For sample firmware file names, see [Sample software and firmware file names](#) on page 90.

4. Double-click the file name of the file you want to download.

The File Download window appears.

Downloading files can occasionally add “1” to the file name. Rename the file if necessary.

5. Select **Save this file to disk**.
6. Save the file to directory on the SCP, FTP, TFTP or HTTPS server on the local LAN that was created for this purpose.

For more information, see [Setting up a file server](#) on page 89.

## Sample software and firmware file names

| Component                                  | File name Example           | Notes                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Branch Gateway Processors                  |                             |                                                                                                                                                                                                                                                                                                                                                                                             |
| Branch Gateway Processor (G450 v1, v2, v3) | <i>g450_sw_42_4_0.bin</i>   |                                                                                                                                                                                                                                                                                                                                                                                             |
| Branch Gateway Processor (G450 v4)         | <i>g450v4_sw_42_4_0.bin</i> | G450 hardware vintage 4 uses the software image <i>g450v4_sw_x_y_x.bin</i> .<br><br>For checking the hardware vintage of the model before downloading the G450 software image, see <a href="#">Checking the G450 hardware vintage from the Branch Gateway CLI</a> on page 91 or <a href="#">Checking the G450 hardware vintage from the Communication Manager web interface</a> on page 93. |

*Table continues...*

| Component                                                   | File name Example                          | Notes |
|-------------------------------------------------------------|--------------------------------------------|-------|
| Media modules                                               |                                            |       |
| MM710 E1/T1 media module                                    | <i>mm710v3.fdl</i>                         |       |
| MM710B E1/T1 media module                                   | <i>mm710v3.fdl</i><br><i>mm710bv47.fdl</i> |       |
| MM711 Analog Port/Trunk media module (version 6 or earlier) | <i>mm711v16.fdl</i>                        |       |
| MM711 Analog Port/Trunk media module (version 7)            | <i>mm711h7v21.fdl</i>                      |       |
| MM711 Analog Port/Trunk media module (version 20 or later)  | <i>mm711h20v54.fdl</i>                     |       |
| MM712 DCP media module                                      | <i>mm712v14.fdl</i>                        |       |
| MM714 Analog Port/Trunk media module                        | <i>mm714v5.fdl</i>                         |       |
| MM714B Analog Port/Trunk media module                       | <i>mm714h10v93.fdl</i>                     |       |
| MM716 Analog Port/Trunk media module                        | <i>mm716v80.fdl</i>                        |       |
| MM717 DCP media module                                      | <i>mm717v3.fdl</i>                         |       |
| MM720 BRI media module                                      | <i>mm720v1.fdl</i>                         |       |
| MM721 BRI media module                                      | <i>mm721v1.fdl</i>                         |       |
| MM722 BRI media module                                      | <i>mm722v3.fdl</i>                         |       |

## Checking the G450 hardware vintage from the Branch Gateway CLI

### About this task

You can check the hardware vintage of the model before downloading the G450 software image.

### Before you begin

Log in to the application CLI interface.

### Procedure

To check the hardware vintage, run the **show system** command and check the `Model` and `HW Vintage` rows:

- G450 v3 displays the following message:

```

System Name           :
System Location       :
System Contact        :
Uptime (d,h:m:s)      : 1,02:13:37
Call Controller Time   : 10:54:36 23 MAR 2020
Serial No             : 10IS09363610

```

```
Model : G450
Chassis HW Vintage : 1
Chassis HW Suffix : A
Mainboard HW Vintage : 3
Mainboard HW Suffix : A
Mainboard FW Vintage : 41.24.0
LAN MAC Address : a4:25:1b:a6:53:d8
WAN1 MAC Address : a4:25:1b:a6:53:d9
WAN2 MAC Address : a4:25:1b:a6:53:da
SERVICES MAC address : a4:25:1b:a6:53:db
Memory #1 : 256MB
Compact Flash Memory : No CompactFlash card is installed
PSU #1 : 400W
PSU #2 : 400W
Media Socket #1 : MP160 VoIP DSP Module
Media Socket #2 : MP160 VoIP DSP Module
Media Socket #3 : Not present
Media Socket #4 : Not present
FAN Tray : Present
```

- G450 v4 displays the following message:

```
System Name :
System Location :
System Contact :
Uptime (d,h:m:s) : 1,02:11:48
Call Controller Time : 10:52:56 23 MAR 2020
Serial No : 19N510404915
Model : G450v4
Chassis HW Vintage : 1
Chassis HW Suffix : A
Mainboard HW Vintage : 4
Mainboard HW Suffix : A
Mainboard FW Vintage : 41.24.0
LAN MAC Address : c8:1f:ea:aa:93:d0
WAN1 MAC Address : c8:1f:ea:aa:93:d1
WAN2 MAC Address : c8:1f:ea:aa:93:d2
SERVICES MAC address : c8:1f:ea:aa:93:d3
Memory #1 : Not present
Compact Flash Memory : No CompactFlash card is installed
PSU #1 : 400W
PSU #2 : Not present
Media Socket #1 : MP160 VoIP DSP Module
Media Socket #2 : MP160 VoIP DSP Module
Media Socket #3 : Not present
Media Socket #4 : Not present
FAN Tray : Present
```



### Note:

G450 v4 displays G450v4 as the Model and 4 as the HW Vintage.

## Checking the G450 hardware vintage from the Communication Manager web interface

### About this task

You can check the hardware vintage of the model before downloading the G450 software image from the Communication Manager web interface.

### Before you begin

Log in to the Communication Manager web interface.

### Procedure

To check the hardware vintage, run the **display media-gateway 23** command and check the FW Version/HW Vintage row:

The system displays the following message:

```

MEDIA GATEWAY 23

      Type: g450
      Name: g450-ab1
      Serial No: 19N510404915
Link Encryption Type: any-ptls/tls      Enable CF? n
Mutual Authentication: optional
      Network Region: 52      Location: 1
      Use for IP Sync? y      Site Data:
      Recovery Rule: 1

      Registered? y
      Gateway Mode: Enterprise
FW Version/HW Vintage: 41 .24 .0 /4
      MGP IPV4 Address: 172.16.1.100
      MGP IPV6 Address: fd00:db3:9:76::255:100
Controller IP Address: 172.16.1.201
      MAC Address: c8:1f:ea:aa:93:d0

Mutual Authentication? optional

```

### \* Note:

The **Type** value is the same for all G450 versions. The G450 v4 displays 4 as the **HW Vintage**.

---

## Upgrading Branch Gateway firmware using the CLI via a USB device

### About this task

You can upgrade firmware via a USB mass storage device using the CLI. The upgrade files must first be downloaded to a local PC.

### Procedure

1. Prepare installation worksheets.  
See [Preparing installation worksheets](#) on page 89.
2. Download the firmware files to a PC.  
See [Downloading Branch Gateway firmware files to a local PC](#) on page 95.
3. Insert a USB mass storage device into the PC's USB port, and copy the firmware files to the USB mass storage device.
4. Remove the USB mass storage device from the PC, and insert it into the Branch Gateway USB port.
5. Run CLI commands to copy the firmware files from the USB mass storage device to the Branch Gateway.  
See [CLI commands for upgrading Branch Gateway firmware via a USB device](#) on page 94.

## CLI commands for upgrading Branch Gateway firmware via a USB device

You can use CLI commands to upload an upgrade file from a USB mass storage device to the Branch Gateway. You must use the specific path to the file on the USB mass storage device.

- Use the **copy usb module** command, followed by the slot number of the module you want to upgrade, to upgrade the firmware on a media module from a USB mass storage device
- Use the **copy usb SW\_imageA** command to upgrade the Branch Gateway firmware into Bank A from a USB mass storage device
- Use the **copy usb SW\_imageB** command to upgrade the Branch Gateway firmware into Bank B from a USB mass storage device

## Example upgrade using the CLI via a USB device

To upgrade the firmware of an MM712 media module in slot 3 from a USB mass storage device where the upgrade file is located in the directory `\temp\`, use the following command:

```
copy usb module usbdevice0 \temp\mm712v51.fdl 3
```

## Downloading firmware files to a local computer

### Procedure

1. Go to the [Avaya support](#) website.
2. Navigate to Media Gateway downloads.
3. Locate the file names that match the files listed in your installation worksheet.  
For sample firmware file names, see [Sample software and firmware filenames](#) on page 90.
4. Double-click the file name of the file you want to download.  
The File Download window appears.
5. Select **Save this file to disk**.
6. Save the file to a directory on the local computer.
7. **(Optional)** Use WinZip or another zip file tool to unzip the firmware file before copying it to the local computer.

# Chapter 11: IP phone configuration and firmware file upgrades

Branch Gateway supports Trivial File Transfer Protocol (TFTP) downloading of configuration files and firmware files for IP phones. TFTP can be used to download image files, upgrade scripts, and settings files to IP phones. The local TFTP server stores the files and supports requests to read files from the outgoing directory for phone images and scripts.

 **Note:**

TFTP server support is available only for IPv4.

You can use CLI procedures for downloading the files for IP phone upgrade from the Branch Gateway TFTP server.

---

## IP phones supported by the local TFTP server feature

The following IP phones are supported by the local TFTP server feature:

- H.323:
  - 4601
  - 4601+
  - 4602
  - 4602SW
  - 4602SW+
  - 4606
  - 4610SW
  - 4612/24
  - 4620
  - 4620SW
  - 4621SW
  - 4622SW
  - 4690

- SIP:
  - 4602 SIP
  - 4602SW
  - 4602SW+
  - 4610SW
  - 4620SW
  - 4621SW

The following IP phones are not supported by the local TFTP server feature:

- 4630
- 4630SW

If you have an S8300 installed on Branch Gateway, you can alternatively upgrade IP phones using the Communication Manager web interface.

The IP address of the TFTP server is the PMI.

---

## Administering the upgrade

When using supported IP phones with the Branch Gateway, the IP phones require the downloading of the settings file and the upgrade scripts. These files are stored in the script banks in NVRAM and are preserved in the event of a reset or power failure. There are two script banks.

In addition, each phone can have a booter application and a phone application. There are four banks that can store up to two phone images (booter and phone application files) at any given time. Since the image files are stored in RAM, a reset or power failure *erases* these files. The image files are used only for upgrading the IP phone, so there is no need to store them permanently. However, the scripts are used by the IP phones when they are reset, and are therefore stored in NVRAM. You can upgrade up to two types of phones and then release the banks for use with another IP phone type.

There are cases where the image files are the same for different IP phone types. In these cases, you can download the image files once for the IP phones that use the same image. The scripts are global to all the supported IP phone images.

You can download and then upload setting script files in order to update their content. It is not recommended to change the upgrade script.

By default, the RAM allocation for TFTP server is 10 MB. You can increase the RAM allocation for TFTP server to up to 11.264 MB at the expense of the Sniffer cache application. The maximum RAM for both applications is 12 MB.

There are four image banks, supporting two IP phone images in RAM, provided the combined file sizes do not exceed the RAM allocation for TFTP server. The maximum size for a booter application or phone application file is 4.5 MB. Thus, it is possible that in some cases, the allocation may only suffice for one complete IP phone image and not two.

 **Caution:**

To activate a change in RAM allocation to the TFTP server, reset is required. Upon reset, any phone image files stored in RAM are erased.

 **Note:**

Previous releases of TFTP server required the configuration of the DHCP server option 43/176 with the named value pair TFTPDIR=/phonedir/ in order to allow the IP phone to access the files in this directory. This configuration is still supported but is no longer required.

## Upgrading an IP phone

### About this task

IP phone upgrade files include script files, boot images files, and phone application image files. You can download these files to a remote FTP/TFTP/SCP server, or you can download them to a laptop and copy them to a USB device. You can then copy the upgrade files to Branch Gateway.

An SCP server can be used for copying the script files, which do not exceed 128 KB, but cannot be used for copying image files. You cannot use SCP to copy `46xxsettings.txt` files as they exceed 128 KB.

Branch Gateway uses the SSH protocol to support the use of SCP for secure file transfer. When using SCP, Branch Gateway is an SCP client, and an SCP server must be configured on the management station.

For more information about establishing an SCP session, see *Administering Avaya G450 Branch Gateway*.

### Procedure

1. Check the available memory size for the image files using the `show application-memory` command.
2. **(Optional)** To set the memory size for the image files, do the following:
  - a. Run the `ip tftp-server file-system size` command.
  - b. Copy the running configuration to the start-up configuration using the `copy running-config startup-config` command.
  - c. Reset Branch Gateway the `reset` command.
3. From the Avaya Support website, obtain the desired phone upgrade files (script files, boot image files, phone application image files), using either of the following methods:
  - Download the phone upgrade files to a remote FTP/TFTP/SCP server.  
You can use SCP to download script files but not image files.
  - Download the upgrade files to a laptop and copy them to a USB mass storage device.
4. Copy the script files for the IP phone family:
  - To copy from the remote FTP/SCP/TFTP server, run one of the following commands:
    - `copy scp phone-script`

- **copy ftp phone-script**
  - **copy tftp phone-script**
  - To copy from the USB device, insert the USB device into a Branch Gateway USB port and copy the files to the resident TFTP server using the **copy usb phone-script** command.
5. Copy the boot image files for up to two IP phone types:
    - To copy from the remote FTP/TFTP server, use either the **copy ftp phone-image** command or the **copy tftp phone-image** command for each IP phone type.
    - To copy from the USB device, insert the USB device into a Branch Gateway USB port and copy the files to the resident TFTP server using the **copy usb phone-image** command.
  6. Copy the phone application image files for up to two IP phone types:
    - To copy from the remote FTP/TFTP server, use either the **copy ftp phone-image** command or the **copy tftp phone-image** command for each IP phone type.
    - To copy from the USB device, insert the USB device into a Branch Gateway USB port and copy the files to the resident TFTP server using the **copy usb phone-image** command.
  7. Reset the phones and wait for the installation to be completed.

Once the upgrade procedure is complete, you can delete the files using the **erase phone-image** command.

---

## TFTP IP telephone upgrade examples

### About this task

In the following example, 4602SW and 4602D phones, which use the same image files, are upgraded first. Later, 4620 phones are upgraded. The script files are not copied for the second upgrade, since they are already stored in NVRAM.

### Upgrading 4602SW and 4602D phones

1. Check the available memory size for the image files using the **show application-memory** command. If the memory size is smaller than the combined sizes of the image files for the phones, proceed to step [2](#) on page 99, otherwise proceed to step [5](#) on page 100.
2. Set the memory size for the image files using the **ip tftp-server file-system size** command.

For example:

```
Gxxx-001(super)# ip tftp-server file-system-size 12228
```

To change ip tftp-server file system size, copy the running configuration to the start-up configuration file, and reset the device  
Gxxx-001(super)

3. Copy the running configuration to the start-up configuration using the **copy running-config startup-config** command.

For example:

```
Gxxx-001(super)# copy running-config startup-config
Beginning copy operation ..... Done!
```

4. Reset the Branch Gateway using the **reset** command.

For example:

```
Gxxx-001(super)# reset
This command will reset the device
*** Reset the device *** - do you want to continue (Y/N)? y

Resetting the device...
```

5. From the Avaya Support website, download the desired phone upgrade files (script files, boot image files, phone application image files) to a remote FTP server at IP address 192.168.49.10.
6. Copy the script files for the 46xx IP phone family using the **copy ftp phone-script** command.

For example:

```
Gxxx-001(super)# copy ftp phone-scriptA 46xxupgrade.txt 192.168.49.10
Confirmation - do you want to continue (Y/N)? y

Username: root
Password:
Beginning download operation ...

This operation may take up to 20 seconds.
Please refrain from any other operation during this time.
For more information , use 'show download phone-script-file status'
command
Gxxx-001(super)#
Gxxx-001(super)# copy ftp phone-scriptB 46xxupgrade.txt 192.168.49.10
Confirmation - do you want to continue (Y/N)? y

Username: root
Password:
Beginning download operation ...

This operation may take up to 20 seconds.
Please refrain from any other operation during this time.
For more information , use 'show download phone-script-file status'
command
Gxxx-001(super)#
```

7. Copy the boot image files for the Avaya 4602 IP phone using the **copy ftp phone-image** command.

For example:

```
Gxxx-001(super)# copy ftp phone-imageA pub\4602dbtel_8.bin 192.168.49.10
```

```

Username: root
Password:
Beginning download operation ...
This operation may take up to 20 seconds.
Please refrain from any other operation during this time.
For more information , use 'show download phone-image-file status'
command
Gxxx-001(super)# copy ftp phone-imageB pub\4602sbte1_8.bin 192.168.49.10

Username: root
Password:
Beginning download operation ...
This operation may take up to 20 seconds.
Please refrain from any other operation during this time.
For more information , use 'show download phone-image-file status'
command

```

8. Copy the phone application image files for the 4602 IP phone type DEF4602D using the **copy ftp phone-image** command.

For example:

```

Gxxx-001(super)# copy ftp phone-imageC pub\4602dape_8.bin 192.168.49.10

Username: root
Password:
Beginning download operation ...
This operation may take up to 20 seconds.
Please refrain from any other operation during this time.
For more information , use 'show download phone-image-file status'
command
Gxxx-001(super)# copy ftp phone-imageD pub\4602sape_8.bin 192.168.49.10

Username: root
Password:
Beginning download operation ...
This operation may take up to 20 seconds.
Please refrain from any other operation during this time.
For more information , use 'show download phone-image-file status'
command

```

9. Reset the phones and wait for the installation to be completed.

## Upgrading 4620 IP phones

### Procedure

1. Copy the boot image files for the 4620 IP phone using the **copy ftp phone-image** command.

For example:

```

Gxxx-001(super)# copy ftp phone-imageA pub\bbla20_1817.bin 192.168.49.10

Username: root
Password:
Beginning download operation ...
This operation may take up to 20 seconds.
Please refrain from any other operation during this time.
For more information , use 'show download phone-image-file status'
command

```

2. Copy the phone application image files for the 4620 IP phone using the **copy ftp phone-image** command.

For example:

```
Gxxx-001(super)# copy ftp phone-imageB pub\def20r1_8_1.bin 192.168.49.10
Username: root
Password:
Beginning download operation ...
This operation may take up to 20 seconds.
Please refrain from any other operation during this time.
For more information , use 'show download phone-image-file status'
command
```

Once the upgrade procedure is complete, you can delete the files using the **erase phone-image** command.

## Failure scenarios and repair actions

There are various configuration related problems which will cause the upgrade to fail. The scenarios can be repaired by readjusting the downloading or configuration settings.

**Table 8: Failure scenarios and repair actions**

| Problem                                                                                                       | Possible cause                                                                                                                                                                                | Action                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| "Free Application Memory is xxx MB. Use <b>show application-memory</b> for more details"                      | You tried to configure more memory than is available in the main bank.                                                                                                                        | Re-adjust the allocation of memory between the Sniffer cache application and the TFTP server. Be sure the Sniffer allocation is not needed for trouble shooting. |
| "Application Memory reached its limits. Sniffer and TFTP server application memory sizes restore to defaults" | You tried to download configuration files after configuring the total memory allocations for applications and Sniffer to more than 12 Mb in the startup configuration and performing a reset. | None. The memory allocations are set to the default values.                                                                                                      |
| Cannot download file to Gateway                                                                               |                                                                                                                                                                                               | See the specific error message you receive.                                                                                                                      |
| "Not enough memory in RAM"                                                                                    | The remote file is larger than the available RAM.                                                                                                                                             | Free more space in the RAM using the <b>erase phone-script</b> or <b>erase phone-image</b> command.                                                              |

*Table continues...*

| Problem                                                                                                             | Possible cause                                             | Action                                                                         |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------|
| "Not enough memory in NVRAM"                                                                                        | The remote file is larger than the available NVRAM.        | Free space in the NVRAM using the <b>erase phone-script</b> command.           |
| "File already Exists in other Bank"                                                                                 | You tried to download the same file to more than one bank. | None. You cannot load two files with the same file name to more than one bank. |
| "TFTP - General failure"                                                                                            | File name or path incorrect                                | Check the file name and path.                                                  |
| "Can't start upload operation. Wrong operation parameters or other operation already in progress, please try again" | You are trying to upload a file from an empty bank.        | Upload from a different bank.<br>Download a file to the bank.                  |

## Upgrade considerations

- Configuration files, such as upgrade script and setting files, are copied to the phone configuration banks in NVRAM, while phone images are stored in RAM

 **Note:**

Image files are cleared if you reset the Branch Gateway.

- Phone image banks are stored in the same TFTP directory. Therefore, you cannot copy the same file name to more than one bank. Copying a file to a bank containing a file with the same file name causes the old file to be overwritten by the new one.
- File names for IP phone image files and script files are limited to 32 characters

# Chapter 12: Branch Gateway backups and restores

This chapter provides instructions for backing up and restoring the Branch Gateway configuration using local backups (USB) and remote backups (network servers). These procedures are important for Branch Gateway replication and restoration after failures.

## Backup and restore methods

- Local backup: Use a USB mass storage device with the **backup config usb** and **restore usb** CLI commands. The local backup method is the most efficient way to restore the Branch Gateway.
- Remote backup: For the remote Branch Gateway, backup and restore individual files using the TFTP, FTP, SCP, or HTTPS server.

The **backup config usb** command saves the gateway configuration, announcement files, TLS certificates, and special VoIP parameters to a USB drive. You can use the USB drive to restore the files to a previously known good state.

---

## Best practices for backup

- Before you perform a backup, run the **copy running-config startup-config** command. This action ensures that the backup includes the current running configuration and allows you to check whether the configuration uses the default password.
- Insert the USB drive into a motherboard USB port and run the following command to verify that the Branch Gateway detects the USB drive formatted as FAT16 or FAT32: **show usb all**
- Run the following command to list the directory contents: **dir usbdevice [directory]**
- When performing the backup, run the **show system** command to determine whether the gateway uses a Compact Flash to store announcements. If the gateway does not use Compact Flash, the Compact Flash Memory status displays `not installed` or `disabled`. You need this information when restoring a new gateway from a USB drive if the gateway is not yet registered to Communication Manager.
- Verify the software load in the **show system** command output. To restore the complete configuration to a new board, ensure that the software load is the same or newer. If the software load is older, Branch Gateway does not support certain features and might

ignore their configurations. Store the downloadable software image in the USB drive backup directory.

- Run the **show fips-mode** command to determine the FIPS mode status.
- Before extracting the USB drive from the gateway, run the **safe-removal usb usbdevice0** command to prevent Branch Gateway file corruption.

**\* Note:**

Maintain current backups to avoid using out-of-date data during a restore. When creating a backup directory, consider including the backup date in the directory name. If you restore a configuration that contains old, forgotten user passwords, you cannot log in. To resolve this, you must perform a manual `nvrw init` operation using the dedicated jumper on the motherboard.

---

## Backup and restore operations

### About this task

You can use this procedure for both FIPS and non-FIPS mode gateways when restoring to the same or a different motherboard. Restoring to a different motherboard requires additional considerations.

**\* Note:**

For non-FIPS mode gateways, if you update the configuration master key after performing a backup, the restore operation fails. In this scenario, create a new backup immediately after updating the configuration master key. You cannot update the configuration master key in FIPS mode gateways.

---

## Backing up G450 gateway

### Procedure

1. Insert the USB drive and run the following command to see its content:

```
dir usbdevice
```

2. Run the following backup command:

```
backup config usb usbdevice0 <backup-dir>
```

If the gateway is not registered to Communication Manager you need also to specify whether the announcements are saved to internal flash or compact flash memory.

For example:

```
g450-007(super)# backup config usb usbdevice0 g450-007_2025-01-15
Backup operation will copy existing files on the gateway to usb mass storage
device.
```

```

Do not remove USB device until the end of operation.
Do you want to continue (Y/N)? y

Beginning backup operation ...
This operation may take a few minutes ...
Please refrain from any other operation during this time.
For more information, use 'show backup status' command.
g450-007(super)# show backup status

Backup operation was successful.
Files backup:

```

| Type           | FileName                                          | Status |
|----------------|---------------------------------------------------|--------|
| startup-config | /usb0/g450-007_2025-01-15/startup_config.cfg      | OK     |
| announcement   | /usb0/g450-007_2025-01-15/GWANNC/anncl.wav        | OK     |
| announcement   | /usb0/g450-007_2025-01-15/GWANNC/annc2.wav        | OK     |
| ...            |                                                   |        |
| other          | /usb0/g450-007_2025-01-15/audio8122.bin           | OK     |
| other          | /usb0/g450-007_2025-01-15/trust/easg/productId    | OK     |
| other          | /usb0/g450-007_2025-01-15/trust/easg/confirmation | OK     |
| other          | /usb0/g450-007_2025-01-15/trust/easg/state        | OK     |
| etc...         |                                                   |        |

## Restoring a gateway backup

### Procedure

1. Insert the USB drive and run the following command to see its content:

```
dir usbdevice
```

2. Run the following command where the backup was saved:

```
restore usb usbdevice0
```

If the gateway is not registered to the Communication Manager, you must specify the announcements location using one of the following commands:

- **announcements-internal-flash**
- **announcements-compact-flash**

For example:

```

G450-??? (super) # restore usb usbdevice0 <backup-dir> announcements-internal-flash
Restore operation will remove existing files on the gateway. Do not remove
USB device until the end of operation.
Do you want to continue (Y/N)? y

Initializing announcement file system - this may take a few minutes.
Beginning restore operation ...
This operation may take a few minutes ...
Please refrain from any other operation during this time.
For more information, use 'show restore status' command.

```

The gateway resets during the restore operation. You can check the current status of the restore both before and after the reset. After the reset, the passwords saved at the time of the backup are restored.

3. To check the final status of the restore operation after the reset, run the following command:

**show restore status**

For example:

```
g450-007(super)# show restore status
```

Restore operation was successful.

Files restored:

| Type           | FileName           | Status |
|----------------|--------------------|--------|
| announcement   | Announcement files | OK     |
| startup-config | startup_config.cfg | OK     |
| other          | audio8122.bin      | OK     |
| other          | trust              | OK     |
| other          | easg               | OK     |
| other          | CA                 | OK     |
| other          | productID          | OK     |
| other          | confirmation       | OK     |
| other          | state              | OK     |
| etc..          |                    |        |

4. Reinstall the TLS gateway certificates using the following command:

**copy scp/usb gw-identity-cert**

 **Warning:**

In FIPS mode, the TLS gateway identity certificates are not restored and must be downloaded again manually after the restore operation is completed.

For example:

```
G450-??? (super) # restore usb usbdevice0 g450-backup announcements-internal-
flash
```

Restore operation will remove existing files on the gateway. Do not remove USB device until the end of operation.

Do you want to continue (Y/N)? y

In FIPS mode the gateway identity certificates/keys are not restored. You must reinstall them using the 'copy scp/usb gw-identity-cert' commands. Do you want to continue (Y/N)? y

 **Warning:**

You cannot restore to a FIPS mode gateway if the gateway enters (or re-enters) FIPS mode after the backup.

---

## Preserving SNMP engine ID

### About this task

Perform this procedure only if you want to preserve the same SNMP engine ID to use it after you replace the motherboard. By default, the gateway derives the SNMP engine ID from the motherboard's MAC address.

### Procedure

1. Record the old engine ID using the following command:

```
show snmp engineID
```

2. Save the old engine ID to the new motherboard using the following command:

```
snmp-server engineID <engineID>
```

---

## Backup and restore for G450 motherboard replacement

The backup and restore process depends on the gateway's FIPS mode status. Determine the current mode using the `show fips-mode` command.

## Backing up and restoring for non-FIPS mode gateways

### About this task

The standard backup and restore procedure works as expected, provided the configuration master key on the old motherboard matches the new motherboard.

### Procedure

1. On the old gateway, run the following command to verify the master key:

```
copy running-config startup-config
```

If the command prints the warning, the backup from the old motherboard can be restored on the new motherboard without any further action.

For example:

```
Warning! It is a recommended policy to override default configuration master key
with user defined secret - for details see user reference.
```

If the command does not print the warning, the user has configured a new master configuration key.

2. **(Optional)** If you do not know the master configuration key, do the following:
  - a. Set a new passphrase. Run the following command:

```
key config-key password-encryption
```
  - b. Save the passphrase. Run the following command:

**copy running-config startup-config**

3. After changing the key, record the new passphrase and perform the backup of the old board.
4. Insert the new board and enter the default username `root` and password `root` to log in.
5. Change the password and configure EASG.

The following are the options:

- Enable
  - Disable
6. **(Optional)** If you are restoring from a backup, you can skip the initial gateway configuration and disable DHCP.

For example:

```
--- Gateway Configuration Script ---
The script will provide you basic gateway connectivity configuration.
Configuration Script - do you want to continue (Y/N)? n

Note: The PMI is currently configured with DHCP on VLAN 1
Do you want to remove it [Y]: y
```

If you configured a master configuration key password before the backup, you must set the same configuration password for the new gateway using the following commands:

- **key config-key password-encryption**
  - **copy running startup-config**
7. To check the software load, run the following command:

**show system**

After the backup is done, if the software load is older than the one used in the previous motherboard, then:

- Update the software load manually. You can update the software using an image stored in the USB drive so you do not need to configure the networking parameters.
- Allow the restore operation update the software load. If you manually add software downloadable files to the backup directories, the restore also updates the firmware of the motherboard and media modules. The motherboard software must be present in the backup folder, and the media module firmware must be present in the MM subfolder.

For example:

A backup directory that contains a G450v4 software image version 43.28.0.

```
g450-??? (super) # dir usbdevice0 g450-backup
  Date                Type                Size(Bytes)                Filename
  -----
2026-01-15,11:17:48    file                728                        audio8122.bin
2026-01-15,11:17:48    file                865                        README.TXT
2026-01-15,15:09:38    file                16598907                   g450v4_sw_43_28_0.bin
2026-01-15,11:17:46    <DIR>                4096                       IPHONE
2026-01-15,11:17:48    <DIR>                4096                       GWANNC
2026-01-15,11:17:46    <DIR>                4096                       MM
```

```
2026-01-15,11:17:48    <DIR>          4096          TRUST
2026-01-15,16:18:34    file           2038          startup_config.cfg
```

- Restore the USB backup to the new board. See [Restoring a gateway backup](#) on page 106.

For example:

A software update during the restore operation, before the automatic reset.

```
g450-???(super)# show restore status
Restore operation in progress.
Files restored:
Type                FileName                Status
-----
startup-config      startup_config.cfg      OK
announcement         anncl.wav              OK
announcement         annc2.wav              OK
swComponent          g450v4_sw_43_28_0.bin   Copying...
```

## Backing up and restoring for FIPS mode gateways

### About this task

FIPS mode gateways use a secure configuration key that cannot be modified and it is different for each motherboard.

### Procedure

- Insert the new board and enter the default username `root` and password `root` to log in.
- Change the password and configure EASG.

The following are the options:

- Enable
- Disable

- (Optional)** If you are restoring from a backup, you can skip the initial gateway configuration and disable DHCP.

For example:

```
--- Gateway Configuration Script ---
The script will provide you basic gateway connectivity configuration.
Configuration Script - do you want to continue (Y/N)? n

Note: The PMI is currently configured with DHCP on VLAN 1
Do you want to remove it [Y]: y
```

- Configure the gateway for FIPS mode of operations using the following command:

```
set fips-mode enable
```

The gateway will reset.

In FIPS mode, you can only restore from a backup that was performed on the same gateway. The restore command fails if executed on a different gateway motherboard.

For example:

```
G450-???(super)# show restore status
Last restore failed with error: genError(2) - Error 210 during download file
/usb0//g450na-nofips/startup_config.cfg: Failed Saving Line 4. The
```

configuration file was encrypted with a different key. Configuration download operation was aborted.

5. To restore non-security data, manually remove all `encrypted-*` lines by editing the configuration stored in the backup file: `startup_config.cfg`
6. Restore the USB backup to the new board. See [Restoring a gateway backup](#) on page 106.

Username, SNMPv3 users, TLS identity certificates must be manually reloaded to the new gateway motherboard, even if it appears that they are restored. If you use this method of restoring non-security data after the automatic reset is performed by the restore you need to log in again using the default password.

7. Configure the password and save the configuration with the new password. Run the following command:

```
copy running-config startup-config
```

At the time of the backup, you need to list the usernames and the SNMPv3 users using the `show usernames` and `show snmp user` command respectively and remember to restore them after the restore operation is completed. You can run the `show gw-identity h248reg|sla|syslog|web` command to verify which certificates are present and should be restored.

---

## Backing up and restoring for gateway replacement

### About this task

Replacing a gateway introduces a new chassis serial number.

### Procedure

1. Perform a backup and restore gateway.
  - For non-FIPS mode gateways, see [Backing up and restoring for non-FIPS mode gateways](#) on page 108.
  - For FIPS mode gateways, see [Backing up and restoring for FIPS mode gateways](#) on page 110.
2. Update the gateway serial number in Communication Manager using the value displayed in the `show system` command output. Run the following command:

```
change media-gateway <n>
```

## Motherboard replacement checklist

### Non-FIPS mode gateway motherboard replacement checklist

| Step                                     | Procedure/Action                                                                                                                                                                             | CLI command/Note                                                                                                                                                                                                      |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pre-replacement (backup procedure)       |                                                                                                                                                                                              |                                                                                                                                                                                                                       |
| Save running config                      | Required: Save the current running configuration.                                                                                                                                            | <code>copy running-config startup-config</code>                                                                                                                                                                       |
| Check for default master key             | Run <code>copy running-config startup-config</code> . If no warning is printed, a non-default key is configured, proceed to step 3 if not known. If a warning is printed, proceed to step 4. | <code>copy running-config startup-config</code><br><br> <b>Note:</b><br>Look for the Warning! It is a recommended policy... message. |
| Set master key (if non-default)          | If a non-default master key was configured (no warning in step 2) and the key is unknown, set a new passphrase before performing the backup.                                                 | <code>key config-key password-encryption</code><br>followed by<br><code>copy running-config startup-config</code>                                                                                                     |
| Check announcements location and SW load | Required. Record the current load version and the announcement storage location (Compact flash or Internal).                                                                                 | <code>show system</code><br>To see announcement files:<br><code>show announcements files brief</code>                                                                                                                 |
| Record SNMP Engine ID                    | Recommended. Record the current SNMP Engine ID to maintain it on the new board.                                                                                                              | <code>show snmp engineID</code>                                                                                                                                                                                       |
| Perform backup                           | Required. Perform the backup to a directory on the USB drive.                                                                                                                                | <code>backup config usb usbdevice0 &lt;backup-dir&gt;</code><br><br>If the gateway is not registered, add announcement location.                                                                                      |
| Safe removal                             | Required. Safely remove the USB drive.                                                                                                                                                       | <code>safe-removal usb usbdevice</code>                                                                                                                                                                               |
| Post-replacement (restore procedure)     |                                                                                                                                                                                              |                                                                                                                                                                                                                       |
| Initial new board login                  | Login with default credentials (root, root), answer the EASG question, skip the configuration script, and disable DHCP.                                                                      | Respond <code>n</code> to Configuration Script and <code>y</code> to remove DHCP.                                                                                                                                     |

*Table continues...*

| Step                            | Procedure/Action                                                                                                                                                                          | CLI command/Note                                                                                                                        |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Set master key (if non-default) | If a master key was configured on the old board (step 1.3), set the same key on the new board before restoring.                                                                           | <b>key config-key password-encryption</b><br><br>followed by<br><b>copy running startup-config</b>                                      |
| Update software load            | Check and update. If the new board's software load is older than the backup's, update it manually or include the software image in the backup folder for automatic update during restore. | <b>show system</b><br><br>to check; place <b>g450v4_sw_...bin</b> in backup directory for automatic software update during the restore. |
| Restore from USB                | Standard procedure.                                                                                                                                                                       | <b>restore usb usbdevice0 &lt;backup-dir&gt; [announcements-location]</b>                                                               |
| Restore SNMP Engine ID          | If needed. Set the old SNMP Engine ID.                                                                                                                                                    | <b>snmp-server engineID &lt;engineID&gt;</b><br>(using the value recorded in Step 1.5)                                                  |

## FIPS mode gateway motherboard replacement checklist

| Step                                     | Procedure/Action                                                                                                                                        | CLI command/Note                                                                                                                                           |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pre-replacement (backup procedure)       |                                                                                                                                                         |                                                                                                                                                            |
| Save running config                      | Required. Save the current running configuration.                                                                                                       | <b>copy running-config startup-config</b>                                                                                                                  |
| Record security info                     | Required. Configuration master key cannot be modified in FIPS mode, so certain security-related data is not restored. Record the necessary information. | <ul style="list-style-type: none"> <li><b>show usernames</b></li> <li><b>show snmp user</b></li> <li><b>show gw-identity h248reg   syslog..</b></li> </ul> |
| Check announcements location and SW load | Required. Record the current load version and the announcement storage location (Compact flash or Internal).                                            | <b>show system</b><br><br>To see announcement files:<br><b>show announcements files brief</b>                                                              |
| Record SNMP Engine ID                    | Recommended. Record the current SNMP Engine ID to maintain it on the new board.                                                                         | <b>show snmp engineID</b>                                                                                                                                  |
| Perform backup                           | Required. Perform the backup to a directory on the USB drive.                                                                                           | <b>backup config usb usbdevice0 &lt;backup-dir&gt;</b>                                                                                                     |
| Safe removal                             | Required. Safely remove the USB drive.                                                                                                                  | <b>safe-removal usb usbdevice</b>                                                                                                                          |
| Post-replacement (restore procedure)     |                                                                                                                                                         |                                                                                                                                                            |
| Initial new board login                  | Login with default credentials (root, root), answer EASG questions, skip the configuration script, and disable DHCP.                                    | Respond <b>n</b> to configuration script and <b>y</b> to remove DHCP.                                                                                      |

*Table continues...*

| Step                                            | Procedure/Action                                                                                                                                                                          | CLI command/Note                                                                                                                                                        |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enable FIPS mode                                | Required. Configure the gateway for FIPS mode. The gateway will reset, and you must repeat step II.1 afterward.                                                                           | <code>set fips-mode enable</code>                                                                                                                                       |
| Update software load                            | Check and update. If the new board's software load is older than the backup's, update it manually or include the software image in the backup folder for automatic update during restore. | <code>show system</code> to check; place downloadable image.<br><br><code>g450v4_sw_...bin</code> in backup directory for automatic software update during the restore. |
| Manual configuration to restore non secure data | Recommended. Manually edit <code>startup_config.cfg</code> on the USB drive to remove all <code>encrypted-*</code> lines.                                                                 | Edit the <code>startup_config.cfg</code> and remove all <code>encrypted-*</code> lines.                                                                                 |
| Restore from USB                                | Restore will fail if step 5 was not done due to the secure configuration key mismatch (keys are unique to each motherboard).                                                              | <code>restore usb usbdevice0 &lt;backup-dir&gt; [announcements-location]</code>                                                                                         |
| Manual password/config Save                     | Required. After the restore, login with the default password, configure a new password, and save the configuration.                                                                       | <code>copy running-config startup-config</code>                                                                                                                         |
| Restore recorded security info                  | Required. Manually reload the usernames, SNMPv3 users, and TLS certificates that were recorded in step I.2.                                                                               | <code>username snmp username</code><br><br><code>copy scp/usb gw-identity-cert</code> commands for certificates.                                                        |
| Restore SNMP Engine ID                          | If needed. Set the old SNMP Engine ID.                                                                                                                                                    | <code>snmp-server engineID &lt;engineID&gt;</code><br>(using the value recorded in Step I.3).                                                                           |

## Post restoration of gateway checks

Useful commands to verify the restoration and gateway status.

- `show running-config`
- `show announcements files brief`
- `show voip-parameters`
- `show gw-identity-cert [h248 | syslog | sla | web]`
- `show root-ca [h248 | syslog | sla | web]`

# Chapter 13: Troubleshooting

You can have problems with phones, a trunk, the power, or the WAN. It is necessary to identify the specific problem to figure out how it can be resolved. In addition, you may have to perform an NVRAM initialization if you are unable to access the CLI.

---

## One telephone stops working

If one telephone in the network stops working, but the other telephones and data devices continue to work normally, the problem is probably with the telephone itself. There could also be a problem with the telephone's connection to the Branch Gateway, or a power management event, in which the power budget is exceeded and low priority ports are disconnected.

---

## Identifying the problem when one phone stops working

### Proposed Solution

#### Procedure

Replace the telephone.

If the new telephone works, the problem is with the telephone itself. If the new telephone does not work, go on to the next step. For more information, see *Maintenance Commands for Avaya Aura® Communication Manager, Branch Gateways and Servers*

---

## No power on the Branch Gateway

### Proposed Solution

#### Procedure

1. Check the AC power source with a voltmeter.

2. Connect the Branch Gateway to a different AC power source.

If the Branch Gateway has power, the problem is with the original power source. If the Branch Gateway still does not work, go on to the next step.

3. Check the ALM LED on the Branch Gateway chassis.

If it is lit, there may be a system-wide problem. Contact your project manager. See “Front panel description”.

---

## CLI is not accessible

Check the connectivity to the Branch Gateway. Correct the ip address and subnet on the PC attached to the Branch Gateway, and the cable. Contact a certified technician if you can't resolve this problem.

---

## NVRAM Init

Perform an NVRAM Init only when you cannot access the Branch Gateway, for example when the Branch Gateway resets continuously.

 **Important:**

Performing the NVRAM Init restores the Branch Gateway to its initial state with the default settings.

You can perform an NVRAM initialization using a jumper on the Branch Gateway main board.

 **Voltage:**

Disconnect the Branch Gateway from the external power source before proceeding.

 **Electrostatic alert:**

Do not touch any components on the printed circuit board except when installing or removing the bridge for the jumper pins.

## Proposed Solution

### Procedure

1. Remove the Branch Gateway main board.
2. To determine the G450 main board version number, look for the label on the main board. The label includes the CS number. The number following “CS” is the main board version number.

Version 1.x differs from other versions in the placement of components on the main board.

3. Locate the NVRAM init jumper towards the front of the Branch Gateway main board.
  - a. In Branch Gateway 1.x, the jumper is labeled *P5*.

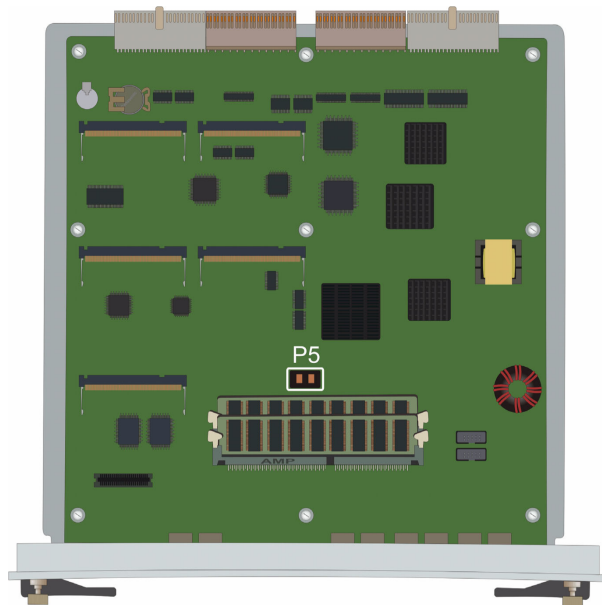


**Figure 27: NVRAM INIT Jumper in the G450 Branch Gateway 1.x**

- b. In Branch Gateway 2.x and 3.x, the jumper is labeled *NVRM\_INIT*.

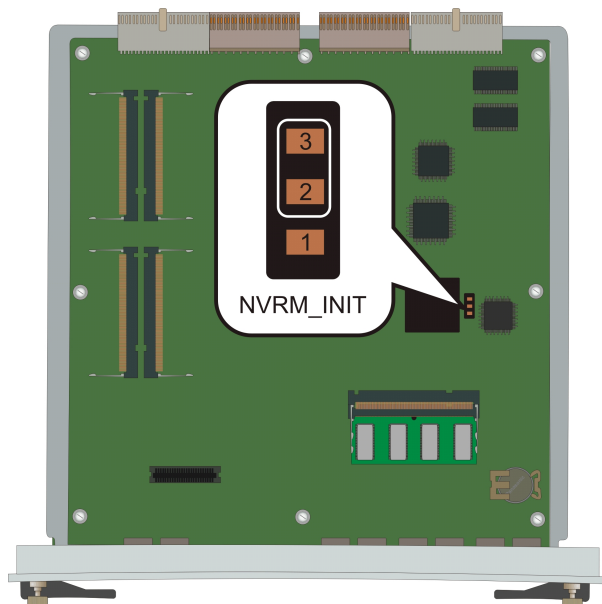


**Figure 28: NVRAM INIT Jumper in G450 Branch Gateway 2.x, 3.x and approximate position in 4.x**

- c. In Branch Gateway 4.x, the jumper is labeled *J701 NVRAM*.

4. Bridge the NVRAM INIT jumper:
  - a. In a G450 Branch Gateway 1.x, use the bridge provided in the accessory kit to bridge jumper P5.
  - b. In a G450 Branch Gateway 2.x, 3.x, and 4.x, use the bridge provided in the accessory kit to bridge pins 2 and 3 of the NVRM INIT jumper.

Pins 2 and 3 are closer to the front panel of the main board.
5. Insert the Branch Gateway main board.
6. Let the Branch Gateway operate for about 5 minutes so that it will boot and erase the current configuration.
7. Remove the Branch Gateway main board.
8. Remove the bridge.



**Important:**

If you do not remove the bridge, the Branch Gateway will continue to initialize the NVRAM when it resets or is powered up.

9. Insert the Branch Gateway main board.

# Chapter 14: Front panel description

You can use the front panel of the Branch Gateway to:

- Connect devices
- Add media modules
- View LEDs
- Reset the device
- Reset and recover from the alternate bank

---

## The front panel of the Branch Gateway chassis without media modules

There are four hardware versions of the G450 Branch Gateway, referred to as *G450 Branch Gateway 1.x*, *G450 Branch Gateway 2.x*, *G450 Branch Gateway 3.x*, and *G450 Branch Gateway 4.x*. 1.x and 2.x refer to the hardware suffix of the Branch Gateway that is printed on the label displayed on the rear of the chassis. The differences between the two versions are minor, and include slightly different front panels, and different placement of components on the main boards. The front panels in versions 2.x, 3.x, and 4.x are identical, with minor differences with version 1.x.

- On the G450 version 1.x, the RST button is to the *left* of the ASB button.
- On the G450 versions 2.x, 3.x, and 4.x, the RST button is *above* the ASB button.

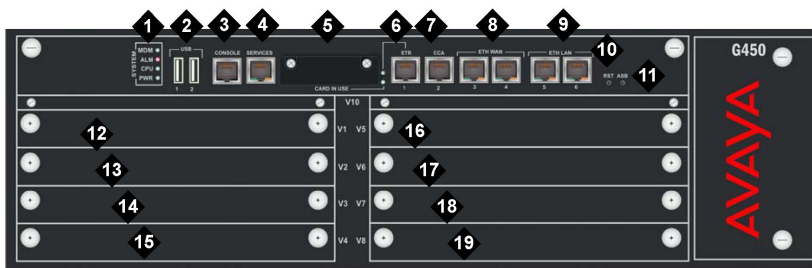


Figure 29: The G450 1.x front panel ports and slots

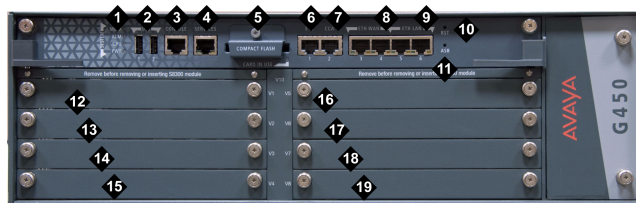


**Figure 30: The G450 2.x, 3.x, and 4.x front panel ports and slots**

- |                                        |                                                 |
|----------------------------------------|-------------------------------------------------|
| 1. System (SYSTM) LEDs                 | 11. ASB button                                  |
| 2. USB ports                           | 12. V1: slot for a media module or S8300 Server |
| 3. Console (CNSL) port                 | 13. V2: slot for a media module                 |
| 4. Services (SVCS) port                | 14. V3: slot for a media module                 |
| 5. Compact Flash (CMPCT FLSH) slot     | 15. V4: slot for a media module                 |
| 6. ETR (Emergency Transfer Relay) port | 16. V5: slot for a media module or S8300 Server |
| 7. CCA (Contact Closure) port          | 17. V6: slot for a media module                 |
| 8. ETH WAN ports                       | 18. V7: slot for a media module                 |
| 9. ETH LAN ports                       | 19. V8: slot for a media module                 |
| 10. RST button                         |                                                 |

## Media module slots

The G450 has eight standard media module slots (V1 through V8).

For information about the different media modules that can be housed in the media module slots, see [Combination limitations](#) on page 30 and *Slot Allocation*.

## System (SYSTM) LEDs

**Table 9: System LEDs**

| LED | Name           | Color | Indication                                                                      |
|-----|----------------|-------|---------------------------------------------------------------------------------|
| MDM | Modem Detected | Green | A modem is connected to the CONSOLE (CNSL) or USB port                          |
| ALM | Alarm          | Red   | An alarm is present in the system, or an enabled compact flash has been removed |
| CPU | CPU            | Green | OFF — A test is in progress<br>ON — Normal operation                            |
| PWR | Power          | Green | OFF — No power<br>BLINKING — Problem with power<br>ON — Normal operation        |

## USB ports

These ports are standard USB ports, USB 1.1 and 2.0 compatible. The USB ports support the connection of:

- USB flash drive
- USB modem

## Console port (Console/CNSL)

The Console port is a standard RJ-45 network port. Use the Console port to connect a console device or modem to the Branch Gateway.

**\* Note:**

Use the provided console cable.

## Services port (Services/SVCS)

The Services port is a standard RJ-45 network port. Use the Services port to connect a laptop through a 10/100 Mbps Ethernet port to the Branch Gateway for configuration purposes.

**\* Note:**

Use a cross-over Ethernet cable.

## Compact Flash (CMPCT FLSH) Interface

The compact flash slot enables to increase the number of announcement files on the Branch Gateway from 256 to 1024, by storing them on a removable 1 GB compact flash memory card. Note that, since the announcements are played from the RAM, you must also increase the RAM from 256 MB to 512 MB. You can obtain an Avaya upgrade memory kit which includes both, a compact flash memory card and a RAM memory card. For instructions on installing and enabling the compact flash memory card, see *Job Aid: Installing the upgrade memory kit components in the Avaya Branch Gateways*, 03-603203.

The yellow CARD IN USE (CF BSY) LED adjacent to the compact flash slot indicates the state of the compact flash memory card.

**Table 10: Compact Flash CARD IS USE LED states**

| LED         | State           | Meaning                                                                                                     |
|-------------|-----------------|-------------------------------------------------------------------------------------------------------------|
| CARD IN USE | Steady yellow   | A compact flash card is inserted but not being used. You can safely remove the card. (G450 v1.and G450 v4). |
|             | Flashing yellow | A compact flash card is in use. Do not remove the compact flash card while the LED is flashing.             |
|             | Off             | A compact flash card is not inserted, or you can remove the compact flash card (G450 v2 and G450 v3).       |

## The Emergency Transfer Relay (ETR) port

The Emergency Transfer Relay (ETR) port is a standard RJ-45 network port. Use the ETR port to connect to up to two 808A Emergency Transfer Panels. These panels provide basic telephone services in the event of system failure.

When the Emergency Transfer Relay (ETR) feature is activated, the green ETR LED is lit.

For more information on Emergency Transfer Relay, see *Installing an 808A Emergency Transfer Panel and associated telephones*.

For information on installing the 808A Emergency Transfer Panel, see *808A Emergency Transfer Panel Installation Instructions*, which ships with the Emergency Transfer Panel.

## Contact Closure (CCA) port

The Contact Closure port (CCA) is wired as an RJ-14 port, but uses an RJ-45 network jack. This port is used to support the Branch Gateway's Contact Closure feature. The Contact Closure feature is a controllable relay providing dry contacts for various applications.

The adjunct box provides two contact closures that can be operated in either a normally closed or normally open state. The contact closures can control devices such as, devices that automatically lock or unlock doors or voice recording units. The CCA port can be configured so that the connected devices can be controlled by an end device, such as a telephone. For example, a user can unlock a door by keying a sequence into a telephone keypad. For more information on Contact Closure, see [Installing the Avaya Partner Contact Closure Adjunct](#) on page 53.

## Implementing the Contact Closure feature

### About this task

Connect an Avaya Partner System Contact Closure Adjunct™ box to the CCA port.

## Router ports (ETH WAN)

Each ETH WAN port is a standard RJ-45 network port. Use ETH WAN to connect a data device to the internal router through a 10/100 Mbps Ethernet port. The Branch Gateway serves as a router for the WAN.

### Note:

For G450 v3, use Shielded Twisted Pair (STP) type CAT5e cables to connect to the jacks labeled "ETH WAN" or "ETH LAN" in countries that require EN55022/EN55032 compliance.

## Switch ports (ETH LAN)

Each ETH LAN port is a standard RJ-45 network port. Use ETH LAN to connect a data device to the switch through a 10/100/1000 Mbps Ethernet port. You can connect an external LAN to ETH LAN.

**\* Note:**

For G430 v3, use Shielded Twisted Pair (STP) type CAT5e cables to connect to the jacks labeled "ETH WAN" or "ETH LAN" in countries that require EN55022/EN55032 compliance.

## RST and ASB buttons

RST is the reset button. ASB is the Alternate Software Bank button.

The Branch Gateway has two firmware banks:

- Bank A
- Bank B

Each firmware bank contains a version of the Branch Gateway firmware. These may be different versions. The purpose of this feature is to provide software redundancy. If one of the versions becomes corrupted, you can reset the Branch Gateway using the other version. This is particularly important when uploading new versions.

By default, when you turn on or reset the Branch Gateway, the Branch Gateway loads firmware from Bank B. This default setting can be changed by the system administrator.

For example, if the Branch Gateway is configured to load firmware from Bank B, you can reset the Branch Gateway to load the firmware from Bank A instead.

## Loading firmware from a bank other than the default bank during startup

### Procedure

1. Press and hold the reset button.
2. Press and hold the ASB button.
3. Release the reset button.
4. Release the ASB button.

---

## The front panel of the Avaya MM710B media module

The MM710B T1/E1 media module terminates a T1 or E1 trunk facility. For T1 connections, you can provision the MM710B to either utilize the integrated Channel Service Unit (CSU) capabilities or connect directly to an external CSU. This information also applies to the MM710.

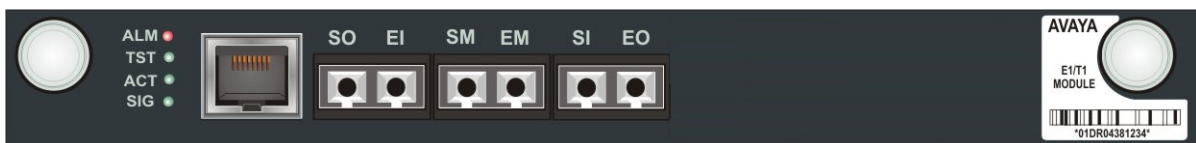


**Figure 31: The MM710B media module front panel**

**\* Note:**

You can use the six ports in the middle of the front panel for testing.  
For drop and insert, you need an external CSU.

## MM710B ports

The MM710B contains an E1/T1 port.

## MM710B LEDs

**Table 11: MM710B LEDs**

| LED | Name     | Color  | Indication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----|----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not the type configured in the MSG for the slot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| TST | Test     | Green  | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ACT | Activity | Yellow | An E1/T1 trunk device connected to the module is in use.<br><br>The light is always on if the trunk is an ISDN E1 or T1 PRI trunk, and the MM710B is not configured as the synchronization source of the Branch Gateway.<br><br>The light flashes at a rate of 2.8 seconds on and 0.2 seconds off if the MM710B synchronization source is configured to synchronize the Branch Gateway and the module is receiving a T1 source signal.<br><br>The light flashes at a rate of 0.2 seconds on and 2.8 seconds off if the MM710B synchronization source is configured to synchronize the Branch Gateway and the T1 source is lost. |
| SIG | Signal   | Green  | The physical connection is up.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## The front panel of the Avaya MM711 media module

The MM711 media module provides analog line, trunk and telephone features and functionality. The MM711 front panel includes eight universal analog ports. These ports can be used for analog telephone or fax machines, or for analog trunks.



**Figure 32: The MM711 media module front panel**

## MM711 ports

The MM711's eight universal analog ports are labeled 1 through 8.

## MM711 LEDs

Table 12: MM711 LEDs

| LED | Name     | Color  | Indication                                                                                                                    |
|-----|----------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not the type configured in the MSG for the slot                                                            |
| TST | Test     | Green  | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion |
| ACT | Activity | Yellow | A device connected to the module is in use. This can include a telephone that is off the hook.                                |

## The front panel of the Avaya MM712 media module

The MM712 DCP media module includes eight DCP telephone ports. The ports support two-wire DCP telephones.



Figure 33: The MM712 media module front panel

## MM712 ports

The MM712's eight DCP telephone ports are labeled 1 through 8.

## MM712 LEDs

Table 13: MM712 LEDs

| LED | Name  | Color | Indication                                                                                                                    |
|-----|-------|-------|-------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm | Red   | The module type is not the type configured in the MSG for the slot                                                            |
| TST | Test  | Green | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion |

*Table continues...*

| LED | Name     | Color  | Indication                                                                                     |
|-----|----------|--------|------------------------------------------------------------------------------------------------|
| ACT | Activity | Yellow | A device connected to the module is in use. This can include a telephone that is off the hook. |

## The front panel of the Avaya MM714 media module

The MM714 analog media module includes four analog telephone ports and four analog trunk ports.

**\* Note:**

The four analog trunk ports can *not* be used for analog DID trunks. Instead, the four analog line ports must be used.

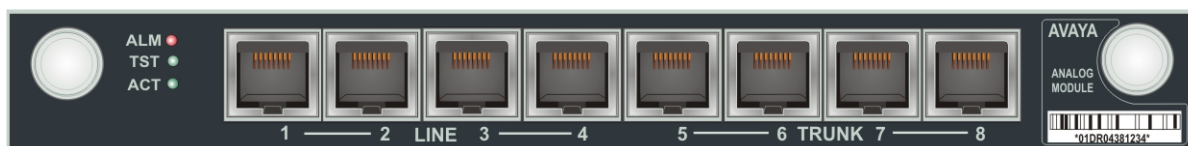


Figure 34: The MM714 media module front panel

## MM714 ports

The MM714's four analog telephone ports are labeled 1 through 4. These ports can also be used for DID trunks.

The MM714's four analog trunk ports are labeled 5 through 8.

## MM714 LEDs

Table 14: MM714 LEDs

| LED | Name     | Color  | Indication                                                                                                                    |
|-----|----------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not the type configured in the MSG for the slot                                                            |
| TST | Test     | Green  | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion |
| ACT | Activity | Yellow | A device connected to the module is in use. This can include a telephone that is off the hook.                                |

### Related links

[The front panel of the Avaya MM714 media module](#) on page 126

## The front panel of the Avaya MM714B media module

The MM714B analog media module provides all the features provided by the MM714 (see [The front panel of the Avaya MM714 media module](#) on page 126), and in addition provides an emergency transfer relay. In the event of system failure, the MM714B provides emergency transfer relay (ETR) services by connecting trunk port 5 and line port 4.



Figure 35: The MM714B media module front panel

### MM714B ports

The MM714B's four analog telephone ports are labeled 1 through 4. These ports can also be used for DID trunks.

The MM714B's four analog trunk ports are labeled 5 through 8.

### MM714B LEDs

Table 15: MM714B LEDs

| LED | Name     | Color  | Indication                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----|----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not the type configured in the MSG for the slot.                                                                                                                                                                                                                                                                                                                                                                                        |
| TST | Test     | Green  | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion.                                                                                                                                                                                                                                                                                                                             |
| ACT | Activity | Yellow | A device connected to the module is in use. This can include a telephone that is off the hook.                                                                                                                                                                                                                                                                                                                                                             |
| ETR | ETR      | Green  | <p>The Emergency Transfer Relay (ETR) feature has been activated. This feature provides an emergency link between the telephone connected to the line port 4 and the trunk connected to trunk port 5 if power is disconnected from the Branch Gateway or if the Branch Gateway becomes unregistered from its Media Gateway Controller (MGC).</p> <p>Turning on ETR manually using the <code>set etr manual-on</code> CLI command also lights this LED.</p> |

# The front panel of the Avaya MM716 media module

The MM716 media module front panel has a 25-pair amphenol connector supporting 24 analog line ports. These ports can be configured as DID trunks with either wink start or immediate start.

The MM716 is compatible with Communication Manager version 2.0 and higher, and Branch Gateway firmware version 25.0.0 and higher.

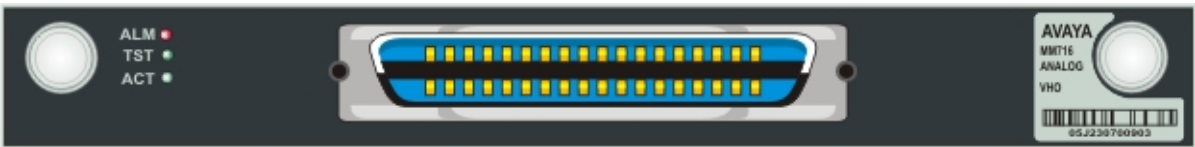


Figure 36: The MM716 media module front panel

## MM716 ports

The MM716 contains a single 25-pair amphenol connector, which can be connected by an amphenol cable to a breakout box or punch down block containing RJ-45 or RJ-11 jacks, as needed. You can attach up to 24 devices (analog telephones, trunks, modems, or fax machines) to these jacks.

Table 16: 25-pair amphenol connector pinout

| Station port | Cable pair |        |
|--------------|------------|--------|
| 1            | White      | Blue   |
| 2            | White      | Orange |
| 3            | White      | Green  |
| 4            | White      | Brown  |
| 5            | White      | Slate  |
| 6            | Red        | Blue   |
| 7            | Red        | Orange |
| 8            | Red        | Green  |
| 9            | Red        | Brown  |
| 10           | Red        | Slate  |
| 11           | Black      | Blue   |
| 12           | Black      | Orange |
| 13           | Black      | Green  |
| 14           | Black      | Brown  |
| 15           | Black      | Slate  |
| 16           | Yellow     | Blue   |
| 17           | Yellow     | Orange |

Table continues...

| Station port | Cable pair |        |
|--------------|------------|--------|
| 18           | Yellow     | Green  |
| 19           | Yellow     | Brown  |
| 20           | Yellow     | Slate  |
| 21           | Violet     | Blue   |
| 22           | Violet     | Orange |
| 23           | Violet     | Green  |
| 24           | Violet     | Brown  |
| OPEN         | Violet     | Slate  |

## MM716 LEDs

Table 17: MM716 LEDs

| LED | Name     | Color  | Indication                                                                                                                    |
|-----|----------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not the type configured in the MSG for the slot                                                            |
| TST | Test     | Green  | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion |
| ACT | Activity | Yellow | A device connected to the module is in use. This can include a telephone that is off the hook.                                |

## The front panel of the Avaya MM717 media module

The MM717 high density DCP media module front panel has a 25-pair amphenol connector supporting 24 Digital Communications Protocol (DCP) ports. To use the MM717 media module, connect an amphenol cable to the port and to either a breakout box or a punch down block containing RJ-45 or RJ-11 jacks, as needed. You can attach up to 24 two-wire DCP telephones to these jacks. The MM717 does not support four-wire DCP telephones.



Figure 37: The MM717 media module front panel

## MM717 ports

The MM717 contains a single 25-pair amphenol connector, which can be connected by an amphenol cable to a breakout box or punch down block containing RJ-45 or RJ-11 jacks, as needed.

**Table 18: 25-pair amphenol connector pinout**

| Station port | Cable pair |        |
|--------------|------------|--------|
| 1            | White      | Blue   |
| 2            | White      | Orange |
| 3            | White      | Green  |
| 4            | White      | Brown  |
| 5            | White      | Slate  |
| 6            | Red        | Blue   |
| 7            | Red        | Orange |
| 8            | Red        | Green  |
| 9            | Red        | Brown  |
| 10           | Red        | Slate  |
| 11           | Black      | Blue   |
| 12           | Black      | Orange |
| 13           | Black      | Green  |
| 14           | Black      | Brown  |
| 15           | Black      | Slate  |
| 16           | Yellow     | Blue   |
| 17           | Yellow     | Orange |
| 18           | Yellow     | Green  |
| 19           | Yellow     | Brown  |
| 20           | Yellow     | Slate  |
| 21           | Violet     | Blue   |
| 22           | Violet     | Orange |
| 23           | Violet     | Green  |
| 24           | Violet     | Brown  |
| OPEN         | Violet     | Slate  |

## MM717 LEDs

**Table 19: MM717 LEDs**

| LED | Name     | Color  | Indication                                                                                                                    |
|-----|----------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not the type configured in the MSG for the slot                                                            |
| TST | Test     | Green  | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion |
| ACT | Activity | Yellow | A device connected to the module is in use                                                                                    |

## The front panel of the Avaya MM720 media module

The MM720 ISDN BRI media module contains eight 4-wire S/T ISDN BRI ports. These ports interface to the central office at the ISDN T reference point.



Figure 38: The MM720 media module front panel

## MM720 ports

The MM720 eight ISDN BRI ports are labeled 1 through 8.

## MM720 LEDs

Table 20: MM720 LEDs

| LED | Name     | Color  | Indication                                                                                                                                                                  |
|-----|----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not the type configured in the MSG for the slot                                                                                                          |
| TST | Test     | Green  | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion                                               |
| ACT | Activity | Yellow | A trunk connected to the module is in use. In Communication Manager 3.0 or higher, the LED could alternatively indicate that a telephone connected to the module is in use. |

## Front panel of the MM721 media module



## MM721 media module ports

The MM721 has eight ports that are labeled from one to eight. The MM721 ports support the use of a 4-wire BRI station device (TE) when you administer the ports as BRI stations.

## MM721 media module LEDs

| LED | Name     | Color  | Indication                                                                                                       |
|-----|----------|--------|------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not configured in the MSG for the slot.                                                       |
| TST | Test     | Green  | The system performs a test on the module through the server, or the module performs a test on initial insertion. |
| ACT | Activity | Yellow | A trunk connected to the module is in use.                                                                       |

## The front panel of the Avaya MM722 media module

The MM722 ISDN BRI media module provides two 4-wire S/T ISDN BRI (Basic Rate Interface) 2B+D access ports with RJ-45 jacks.



Figure 39: The MM722 media module front panel

## MM722 ports

The MM722 contains two ISDN BRI ports.

## MM722 LEDs

Table 21: MM722 LEDs

| LED | Name     | Color  | Indication                                                                                                                                                                  |
|-----|----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALM | Alarm    | Red    | The module type is not the type configured in the MSG for the slot                                                                                                          |
| TST | Test     | Green  | Either a test is being performed on the module via the server, or the module is performing a self-test upon initial insertion                                               |
| ACT | Activity | Yellow | A trunk connected to the module is in use. In Communication Manager 3.0 or higher, the LED could alternatively indicate that a telephone connected to the module is in use. |

# Chapter 15: Technical specifications

This section provides technical specifications for the G450, for compatible power cords, and for USB modem support.

---

## Specifications

The following table describes the Branch Gateway's physical dimensions and tolerances:

| Description                                                                                                                                           | Value                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Height                                                                                                                                                | 5.25 in. (3U, 133.3 mm)                     |
| Width                                                                                                                                                 | 19 in. (482.6 mm)                           |
| Depth                                                                                                                                                 | 18 in. (460 mm)                             |
| Weight of empty chassis                                                                                                                               | 16.5 pounds (7.5 kg)                        |
| Weight of chassis with the basic configuration, including the mainboard, power supply unit, fan tray, one DSP, and blank panels on media module slots | 31 pounds (14 kg)                           |
| Ambient working temperature                                                                                                                           | 32° to 104°F (0° to 40°C)                   |
| Operating relative humidity                                                                                                                           | 10 to 90% relative humidity, non-condensing |
| Storage temperature                                                                                                                                   | -40°F to 150°F (-40°C to 66°C)              |
| Storage relative humidity                                                                                                                             | 10 to 90% relative humidity, non-condensing |
| Left air inlet                                                                                                                                        | Up to 104°F (40°C)                          |
| Operation altitude                                                                                                                                    | Up to 10,000 ft (3000 m)                    |
| Front clearance                                                                                                                                       | 2 in. (5 cm)                                |
| Rear clearance                                                                                                                                        | 4 in. (10 cm)                               |
| Side clearance                                                                                                                                        | 3 in. (7.6 cm)                              |
| AC voltage                                                                                                                                            | 90–264 VAC, 47–63 Hz                        |
| DC voltage                                                                                                                                            | -48 VDC nom. (-43 VDC to -57 VDC)           |
| Power rating                                                                                                                                          | 1780 BTU/h (522 W)                          |
| Max AC                                                                                                                                                | 7 A                                         |
| Max DC                                                                                                                                                | 13.6 A                                      |

---

## AC Power cord specifications

Following are the specifications for power cords suitable for use with the Branch Gateway:

### North America:

The cord set must be UL Listed/CSA Certified, 16 AWG, 3-conductor (3rd wire ground), type SJT. Terminate one end to an IEC 60320, sheet C13 type connector rated 10 A, 250 V. Terminate other end to either a NEMA 5-15P attachment plug for nominal 125 V applications or a NEMA 6-15P attachment plug for nominal 250 V applications.

### Outside North America:

The cord must be VDE Certified or Harmonized (HAR), rated 250 V, 3-conductor (3rd wire ground), 1.0 mm<sup>2</sup> minimum conductor size. Terminate the code at one end to a VDE Certified/CE Marked IEC 60320, sheet C13 type connector rated 10 A, 250 V and the other end to a 3-conductor grounding-type attachment plug rated at a minimum of 10 A, 250 V and a configuration specific for the region/country in which it is used. The attachment plug must bear the safety agency certification mark(s) for the region/country of installation.

---

## DC power cord specifications

For DC power, use Avaya DC power cord, material code 700406358.

---

## USB modems supported by the Branch Gateway

- USRobotics USB modem, model 5637
- Multitech USB modem, model MT5634ZBA-USB-V92

# Chapter 16: Power supplies and adjunct systems

This appendix provides information and wiring examples of installation procedures for various telephone and console power supplies.

In addition, you may need to install one or more adjunct systems or devices. Follow the instructions in:

- [Avaya Aura® Communication Manager messaging application](#) on page 137
- [Call Center](#) on page 137

For these adjunct systems, consult the documentation specific to the system for complete installation instructions.

Your planning documentation specifies the equipment you will be installing.



## **Warning:**

To reduce the risk of fire, use only 26 AWG or larger telecommunication line cords when installing telephones or adjuncts.

---

## Typical adjunct power connections

The 400B2 adapter is convenient for connecting local -48 VDC power to a modular plug. See [the figure](#) on page 136.

See *Documentation for Communication Manager, Branch Gateway and Servers CD*, 03-300151, for detailed power supply information and installation procedures.

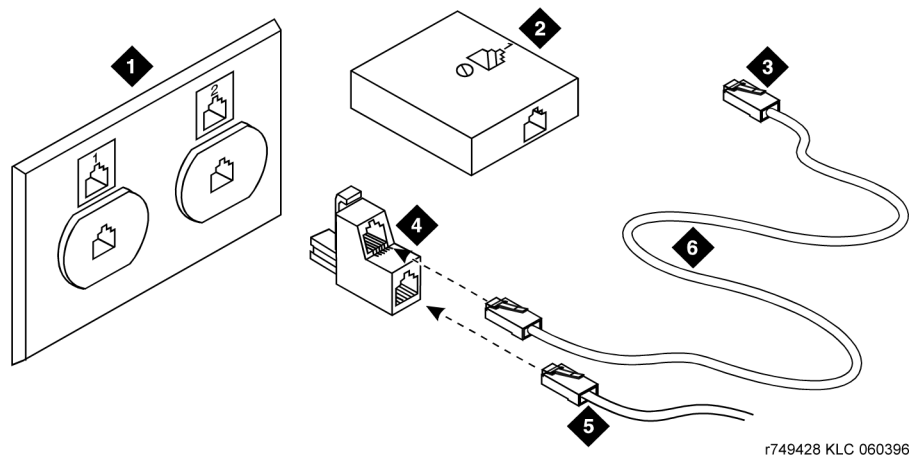


**Figure 40: 400B2 Adapter Connecting to a Modular Plug**

**Table 22: Figure notes:**

1. Flush-Mounted Information Outlet
2. Surface-Mounted Information Outlet
3. To Individual Power Unit
4. 400B2 Adapter
5. To Telephone
6. Destination Service Access Point (DSAP) Power Cord

## Typical adjunct power connections end-to-end

The figure shows typical connection locations for adjunct power.

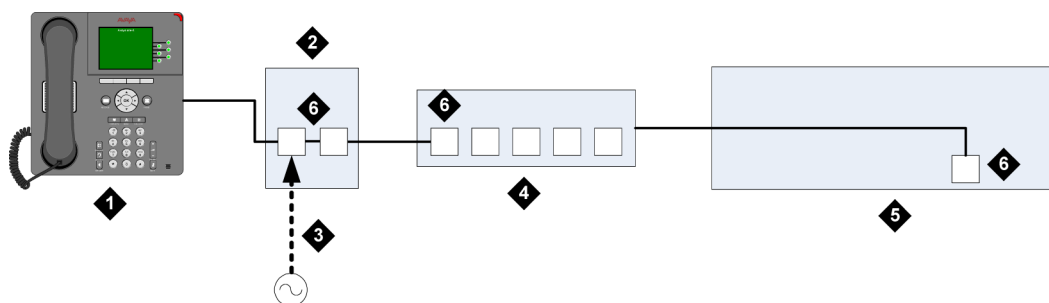


**Figure 41: Example Adjunct Power Connections**

**Table 23: Figure notes:**

1. Avaya IP telephone
2. Power brick
3. AC power inlet
4. Switch
5. Branch Gateway
6. LAN port

---

## Avaya Aura® Communication Manager Messaging application

The Avaya Aura® Communication Manager Messaging application runs as a process on the S8300 server. Without the need for additional hardware, the software processes touch-tones, converts messages to the G.711 format, and converts text to speech.

---

## Call Center

An S8300 server provides an excellent solution for a small Call Center. An S8300 server with one or more Branch Gateway supports the following Call Center capabilities:

- All three Avaya call center packages:
  - Avaya Call Center Basic
  - Avaya Call Center Deluxe
  - Avaya Call Center Elite
- Avaya Branch Gateway announcement software

---

## About Avaya Branch Gateway announcement software

Voice announcements are used in a call center environment to announce delays, direct customers to different departments, and inform calling parties. The announcement capability is standard and comes co-resident on the Branch Gateway. You can substantially increase the number of supported announcement files on the Branch Gateway if you install a compact flash and increased RAM. See *Job Aid: Installing the upgrade memory kit* and configure the G450 in the media-gateway form.

# Chapter 17: Information checklists

You can use this appendix as an aid for collecting necessary information for the installation of a Branch Gateway.

The following lists are provided:

- [Installer's checklist](#) on page 138: Tools, software, laptop settings, customer network information
- Login information: Serial number of the Branch Gateway and login/passwords for various access methods
- [Quick setup for Media Gateway Processor \(MGP\)](#) on page 139: IP addresses and setup commands for the MGP
- [Installation site information](#) on page 141: Customer and site contact information

---

## Installation checklist

|                                                                                |   |
|--------------------------------------------------------------------------------|---|
| <i>Tools</i>                                                                   | √ |
| Laptop                                                                         |   |
| RS-232 port connector or Ethernet interface                                    |   |
| cross-over Ethernet cables                                                     |   |
| direct Ethernet cable                                                          |   |
| USB flash drive (optional)                                                     |   |
| screwdriver                                                                    |   |
| <i>Software</i>                                                                |   |
| Windows operating system                                                       |   |
| FTP server program. TFTP server program and SCP server program are recommended |   |
| SSH program                                                                    |   |
| terminal emulation program: HyperTerminal or other                             |   |
| TCP/IP networking software: bundled with Windows OS                            |   |
| web browser: Netscape or Internet Explorer                                     |   |

*Table continues...*

|                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Ethernet connections</i>                                                                                                                                                                                                                                                                                                          |
| laptop default address and mask: 192.11.13.5, 255.255.255.252                                                                                                                                                                                                                                                                        |
| browser: no proxies                                                                                                                                                                                                                                                                                                                  |
| communications properties: 9600 baud rate; no parity; 8 data bits, 1 stop bit; no flow control                                                                                                                                                                                                                                       |
| <i>SSO login</i>                                                                                                                                                                                                                                                                                                                     |
| Obtaining this login will require that you complete the authentication process. You will not be able to obtain the license file or to perform remote feature activation without the SSO login authentication process. You will not be able to obtain the license file or to perform remote feature activation without the SSO login. |
| <i>Dial plan</i>                                                                                                                                                                                                                                                                                                                     |
| <i>IP addressing plan</i>                                                                                                                                                                                                                                                                                                            |
| <i>List of customer-provided IP services</i>                                                                                                                                                                                                                                                                                         |

## Login information

### Logins

| Entity                   | Name & Password |
|--------------------------|-----------------|
| S8300 Server             |                 |
| Branch Gateway           |                 |
| SSO Authentication Login |                 |
| ftp                      | anonymous       |
|                          | email address   |
| Communication Manager    |                 |

### Quick setup for Branch Gateway Processor (MGP)

| Task                                        | CLI Command                                                                                                                                   | Requested Fields | Information to enter |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------|
| Define a Primary Management Interface (PMI) | Enter the context of the interface which you want to set as the Primary Management Interface (PMI). For example:<br><br><b>interface vlan</b> | <b>vlan id</b>   |                      |

*Table continues...*

| Task                                                                                                                                                                          | CLI Command                                                                                                  | Requested Fields          | Information to enter         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------|
|                                                                                                                                                                               | In the context of the interface, assign an IP address and subnet mask to the interface:<br><b>ip address</b> | <b>IP address</b>         |                              |
|                                                                                                                                                                               |                                                                                                              | <b>netmask</b>            |                              |
|                                                                                                                                                                               | In the context of the interface, define this interface as the PMI<br><b>pmi</b>                              |                           |                              |
| Configure the ICC-VLAN<br><br><b>* Note:</b><br><br>By default, the ICC-VLAN is 1. Therefore configure the ICC-VLAN only if you wish to configure it for a VLAN other than 1. | Create a VLAN and enter its configuration context:<br><b>interface vlan</b>                                  | <b>vlan id</b>            |                              |
|                                                                                                                                                                               | In the context of the VLAN interface, set the current VLAN as the ICC-VLAN:<br><b>icc-vlan</b>               |                           |                              |
|                                                                                                                                                                               | Set the VLAN ID of a LAN port (10/5 or 10/6) to the VLAN number of the ICC-VLAN:<br><b>set port vlan</b>     | <b>vlan id</b>            |                              |
|                                                                                                                                                                               |                                                                                                              | <i>module number</i>      |                              |
|                                                                                                                                                                               |                                                                                                              | <i>port number</i>        |                              |
| Define the CLI prompt                                                                                                                                                         | <b>hostname</b>                                                                                              | <b>hostname</b>           |                              |
| Define a default gateway                                                                                                                                                      | <b>ip default-gateway</b>                                                                                    | <b>gateway IP address</b> |                              |
| Create a list of validMedia Gateway Controller(s)                                                                                                                             | <b>set mgc list</b>                                                                                          | <b>IP address1</b>        |                              |
|                                                                                                                                                                               |                                                                                                              | <b>IP address2</b>        |                              |
|                                                                                                                                                                               |                                                                                                              | <b>IP address3</b>        |                              |
|                                                                                                                                                                               |                                                                                                              | <b>IP address4</b>        |                              |
| An H.248 TLS connection is required                                                                                                                                           | <b>copy scp usb https root-ca h248 reg</b>                                                                   | File location             | Install trusted certificates |
| Display device information                                                                                                                                                    | <b>show system</b>                                                                                           |                           |                              |
| Display the current firmware and boot bank information.                                                                                                                       | <b>show image version</b>                                                                                    |                           |                              |

## Installation site information

|                                 |                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------|
| Site Name                       | Main Phone                                                                              |
| Installation Address            |                                                                                         |
| Shipping Address                |                                                                                         |
| Customer Contact                | Name:<br>Title:<br>Phone:<br>Fax:<br>Mobile:<br>Pager:<br>E-mail:<br>Off-hours contact: |
| Sales person/ Account Executive | Sales/AE phone:<br>Other Contact Info:                                                  |

Notes to installer: access procedures, safety/security procedures

|                                          |                                                                                         |
|------------------------------------------|-----------------------------------------------------------------------------------------|
| Access Contact                           | Name:<br>Title:<br>Phone:<br>Fax:<br>Mobile:<br>Pager:<br>E-mail:<br>Off-hours contact: |
| Installer Name:<br>Date of Installation: |                                                                                         |

# Chapter 18: Equipment list

The following lists contain information necessary for ordering Branch Gateway and Avaya S8300 Server equipment.

**\* Note:**

If ordering parts, use the 9-digit “Comcode” numbers, not the 6-digit numbers.

**Table 24: Equipment List: G450**

| The G450 Branch Gateway is a 19-inch 3U rack-mountable device. The Branch Gateway contains VoIP resources, a layer 2 switch, modular interface connectivity for traditional trunk and station access, and performs the function of a gateway or gatekeeper. It also houses eight Media Module bays. The Branch Gateway is designed to offer options and scalability. You can mix and match Media Modules, as well as add additional Branch Gateways as they grow in size. |                      |                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------|
| Material Code:170896                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Apparatus Code: MGW1 | Not Optional                                                 |
| Branch Gateway Comcodes (for Services Ordering Only)                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                                                              |
| Comcode                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Number of Items      | Description                                                  |
| 700506955                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                    | G450 chassis/Main board/160 channel DSP daughterboard/ 1 PSU |
| 700506956                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                                                              |
| 700017932                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                    | Rack Mount screw set for attaching the ears to the rack      |
| 700438997                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                    | Rack Mount Ears                                              |
| 700439003                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                    | Cable Management Ear                                         |
| 700305535                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 15                   | Rack Mount screw set for attaching the ears to the chassis   |
| 700318421                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4                    | Feet                                                         |
| 700318397                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                    | Tech Laptop Cable                                            |
| 700336597                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8                    | Media Module Blanks                                          |
| 700336621                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                    | Low-Profile blanks (S8300)                                   |
| 700439011                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                    | G450 PSU Blank Panel                                         |
| 700179526                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                    | Documentation, CIB 3246 FCC/Safety G450                      |
| 700236680                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                    | Grounding Kit for multiple G450 devices in a 19 inch rack    |

*Table continues...*

|                                                  |   |                                                                |
|--------------------------------------------------|---|----------------------------------------------------------------|
| 700439029                                        | 1 | Cable grounding terminal-ring to open end 10AWG, 8M            |
| G450 Comcodes for Customer and Services ordering |   |                                                                |
| Comcode                                          |   | Description                                                    |
| 700506955                                        |   | G450 chassis/Main board/160 channel DSP daughterboard/ 1 PSU   |
| 700506956                                        |   |                                                                |
| 700432495• 700504684                             |   | G450 main board G450 Main Supervisor Board Re-Designed Non-GSA |
| 700432503                                        |   | 80 channels DSP daughterboard                                  |
| 700432511                                        |   | 20 channels DSP daughterboard                                  |
| 700432529                                        |   | G450 Power Supply Unit 400W AC                                 |
| 700514994                                        |   | G450 Power Supply Unit 400W DC                                 |
| 700406358                                        |   | DC Power Cord                                                  |
| 700432537                                        |   | G450 Chassis                                                   |
| 700438278                                        |   | G450 Fan tray                                                  |
| 700394992                                        |   | 808A Emergency Transfer Panel                                  |
| 700476419                                        |   | Upgrade memory kit (2.x 3.x)                                   |
| 700510107                                        |   | Upgrade memory kit (1.x)                                       |

**Table 25: Equipment List: Avaya S8300E server**

| Server                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>S8300E server</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p>The Avaya S8300E server is an Intel™-based server complexe that carry:</p> <ul style="list-style-type: none"> <li>• Administration and maintenance provisioning software</li> <li>• Web server</li> <li>• Linux OS</li> <li>• H.248 Branch Gateway Signaling Protocol</li> <li>• CCMS messages tunneled over H.248 Signaling Protocol</li> </ul> <p>The S8300E server can act as the primary server of the Branch Gateway, or can serve as a local survivable processor for remote or branch customer locations.</p> |
| Comcode (for Services Ordering only): 700407810                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Comcodes for S8300E: 700508955,700508924                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Table 26: Equipment List: Media Modules**

| Media Modules             |                                                             |
|---------------------------|-------------------------------------------------------------|
| MM710B T1/E1 Media Module | Comcodes (for Services Ordering Only): 700439250, 700466634 |

*Table continues...*

| Media Modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The MM710B T1/E1 media module offers the combined features of a DEFINITY DS1 circuit pack and includes the following:</p> <ul style="list-style-type: none"><li>• A built-in CSU</li><li>• AMI-BASIC</li><li>• Both A-law for E1 and <math>\mu</math>-law for T1</li><li>• Line Coding: AMI, ZCS, B8ZS for T1 and HDB3 or AMI for E1</li><li>• Stratum 3 Clock compatibility</li><li>• Trunk signaling for supporting US and International CO trunks and tie trunks as currently in existence</li></ul> <p>The MM710B T1/E1 media module supports the universal DS1 conforming to 1.544 Mbps T1 standard and 2.048 Mbps E1 standard.</p> <p>ISDN PRI is also supported for T1 or E1 revenue-associated option. MM710B is RoHS compliant.</p> |                                                             |                                                                                                                                                                                |
| DEF DS1 LOOPBACK JACK 700A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |                                                                                                                                                                                |
| <p>Provides the ability to remotely troubleshoot the MM 710 T1/E1 media module. It is required for any customer with a maintenance contract and highly recommended for any other customer.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             |                                                                                                                                                                                |
| Material Code: 700406101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Apparatus Code: None                                        | Required for any customer with a maintenance contract and an MM710 or MM7110B T1/E1 media module. Highly recommended for other customers to avoid expensive technician visits. |
| MM711 Analog Media Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Comcodes (for Services Ordering Only): 700394661, 700466626 |                                                                                                                                                                                |
| <p>The MM711 Analog media module supports eight analog interfaces allowing the connectivity of Loop Start, Ground Start, Analog DID trunks, and 2-wire analog Outgoing CAMA E911 trunks. The MM711 Analog media module also allows connectivity of analog, tip/ring devices such as single line telephones, modems or group 3 fax machines. Each port may be configured as a trunk interface or a station interface.</p> <p>Also included is support for caller ID signaling, ring voltage generation for a variety of international frequencies and cadences, and administrable line termination styles. MM711 is RoHS compliant.</p>                                                                                                          |                                                             |                                                                                                                                                                                |
| MM714B Analog Media Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Comcodes (for Services Ordering Only): 700453889, 700466618 |                                                                                                                                                                                |
| <p>The MM714B Analog media module supports four analog stations and four CO trunks, as well as an Emergency Transfer Relay between a line port and a trunk port. Analog DID trunk connections are associated with the ports labeled “Line” and not “Trunk”. MM714B is RoHS compliant.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |                                                                                                                                                                                |
| MM712 DCP Media Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Comcode (for Services Ordering Only): 700394745             |                                                                                                                                                                                |
| <p>The MM712 DCP media module allows connectivity of up to eight 2-wire DCP voice terminals. MM712 does not support 4-wire DCP telephones.</p> <p>Signal timing specifications for the MM712 support TDM Bus Timing in receive and transmit modes. The Branch Gateway supplies only +5 VDC and –48 VDC to the MM712 media module. Any other required voltages must be derived on the module.</p>                                                                                                                                                                                                                                                                                                                                                |                                                             |                                                                                                                                                                                |

Table continues...

| Media Modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| The MM712 comes with loop range secondary protection. The MM712 is also self-protecting from an over current condition on a tip and ring interface. MM712 is RoHS compliant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                             |
| MM716 24 port Analog Media Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Comcodes (for Services Ordering Only): 700394703, 700466642 |
| The MM716 provides 24 analog ports supporting telephones, modem, and fax. These ports can also be configured as DID trunks with wink-start or immediate-start. The 24 ports are provided through a 25-pair RJ21X amphenol connector, which can be connected by an amphenol cable to a breakout box or punch down block. MM716 is RoHS compliant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             |
| MM717 24 port DCP Media Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Comcode (for Services Ordering Only): 700394711, 700501048  |
| The MM717 DCP Media Module supports 24 DCP stations. The MM717 uses a 25-pair amphenol connector on the media module's faceplate. The 24 DCP ports are intended for in-building use only. Phone lines connected to those ports are not to be routed out-of-building. Failure to comply with this restriction could cause harm to personnel or equipment. MM717 is RoHS compliant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                             |
| MM720 BRI Media Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Comcode (for Services Ordering Only): 700394752             |
| <p>The MM720 BRI media module contains eight ports that you can administer as BRI trunk connections or BRI endpoint (telephone and data module) connections. Information is communicated in two ways:</p> <ul style="list-style-type: none"> <li>• Over two 64 Kbps channels called B1 and B2 that can be circuit-switched simultaneously</li> <li>• Over a 16 Kbps channel called the D channel that is used for signaling. The D channel occupies one time slot for all eight D channels</li> </ul> <p>The circuit switched connections have a u-law or A-law option for voice operation. The circuit switched connections operate as 64 Kbps clear channels when in the data mode.</p> <p>The MM720 BRI media module does not support combining both B channels together to form a 128 Kbps channel.</p> <p> <b>Note:</b></p> <p>The MM720 BRI media module does not support both BRI trunks and BRI endpoints at the same time.</p> <p>For BRI trunking, the MM720 BRI media module supports up to eight BRI interfaces, or up to 16 trunk ports, to the central office at the ISDN S/T reference point.</p> <p>For BRI endpoints, each of the eight ports on the MM720 BRI media module can support one integrated voice/data endpoint or up to two BRI stations and data modules. Supported endpoints must conform to AT&amp;T BRI, World Class BRI, or National ISDN NI1/NI2 BRI standards. The MM720 BRI media module provides -40 volt phantom power to the BRI endpoints.</p> <p>MM720 is RoHS compliant.</p> |                                                             |
| MM721 BRI Media Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Comcode (for Services Ordering Only): 700393762             |
| <p>The MM721 BRI media module contains eight ports that you can administer as BRI trunk connections or BRI endpoint (telephone and data module) connections. Information is communicated in two ways:</p> <ul style="list-style-type: none"> <li>• Over two 64 Kbps channels called B1 and B2 that can be circuit-switched simultaneously</li> <li>• Over a 16 Kbps channel called the D channel that is used for signaling. The D channel occupies one time slot for all eight D channels</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |

*Table continues...*

**Media Modules**

The circuit switched connections have a u-law or A-law option for voice operation. The circuit switched connections operate as 64 Kbps clear channels when in the data mode.

The MM720 BRI media module does not support combining both B channels together to form a 128 Kbps channel.

 **Note:**

The MM720 BRI media module does not support both BRI trunks and BRI endpoints at the same time.

For BRI trunking, the MM720 BRI media module supports up to eight BRI interfaces, or up to 16 trunk ports, to the central office at the ISDN S/T reference point.

For BRI endpoints, each of the eight ports on the MM720 BRI media module can support one integrated voice/data endpoint or up to two BRI stations and data modules. Supported endpoints must conform to AT&T BRI, World Class BRI, or National ISDN NI1/NI2 BRI standards. The MM720 BRI media module provides -40 volt phantom power to the BRI endpoints.

MM720 is RoHS compliant.

|                               |                                                 |
|-------------------------------|-------------------------------------------------|
| MM722 2-port BRI Media Module | Comcode (for Services Ordering Only): 700395239 |
|-------------------------------|-------------------------------------------------|

The MM722 BRI media module provides two 4 wire S/T ISDN BRI 2B+D access ports with RJ-45 jacks. Each port interfaces with the central office at the ISDN T reference point.

Information is communicated in the same manner as the MM720.

MM722 is RoHS compliant.

# Chapter 19: Miscellaneous references

- For information about licensing in Appliance Virtualization Platform, see *Deploying Avaya Aura® Appliance Virtualization Platform*.
- For information about using Secure Access Link (SAL) for connectivity to Gateway, see *Administering Avaya Diagnostic Server SAL Gateway*.
- For information about configuring SNMP targets from System Manager, see *Administering Avaya Aura® AVP Utilities*.
- For information about installing SSL/TLS certificate for SLA Mon, see *Administering Avaya Diagnostic Server SLA Mon™*.
- For information about backup configuration, see *Administering Avaya G450 Branch Gateway*.

# Chapter 20: Resources

## Branch Gateway documentation

The following table lists the documents related to Branch Gateway. Download the documents from the Avaya Support website at <http://support.avaya.com>.

| Title                                                                   | Description                                                                                                                                                                      | Audience                                                             |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Installing and implementing                                             |                                                                                                                                                                                  |                                                                      |
| <i>Quick Start for Hardware Installation: Avaya G450 Branch Gateway</i> | Describes how to install G450 Branch Gateway in the basic configuration.                                                                                                         | Solution architects, implementation engineers, and support personnel |
| <i>Deploying and Upgrading Avaya G450 Branch Gateway</i>                | Describes how to install and upgrade G450 Branch Gateway, perform basic configuration tasks, insert media modules, and connect external devices.                                 | Solution architects, implementation engineers, and support personnel |
| Administering                                                           |                                                                                                                                                                                  |                                                                      |
| <i>Administering Avaya G450 Branch Gateway</i>                          | Describes how to configure and manage G450 Branch Gateway after the installation. Contains the detailed information about G450 Branch Gateway features and their implementation. | Solution architects, implementation engineers, and support personnel |
| <i>Avaya Branch Gateway G450 CLI Reference</i>                          | Describes the CLI commands for G450 Branch Gateway configuration.                                                                                                                | Solution architects, implementation engineers, and support personnel |
| <i>Avaya Aura® G450 Data Privacy Guidelines</i>                         | Describes how to administer G450 Branch Gateway to fulfill Data Privacy requirements.                                                                                            | Solution architects, implementation engineers, and support personnel |

## Finding documents on the Avaya Support website

### Procedure

1. Go to <https://support.avaya.com>.
2. At the top of the screen, click **Sign In**.
3. Type your **EMAIL ADDRESS** and click **Next**.

4. Enter your **PASSWORD** and click **Sign On**.
5. Click **Product Documents**.
6. Click **Search Product** and type the product name.
7. Select the **Select Content Type** from the drop-down list
8. In **Select Release**, select the appropriate release number.

For example, for user guides, click **User Guides** in the **Content Type** filter. The list only displays the documents for the selected category.

9. Press **Enter**.

## Accessing the port matrix document

### Procedure

1. Go to <https://support.avaya.com>.
2. At the top of the screen, click **Sign In**.
3. Type your **EMAIL ADDRESS** and click **Next**.
4. Enter your **PASSWORD** and click **Sign On**.
5. Click **Product Documents**.
6. Click **Search Product** and type the product name.
7. Select the **Select Content Type** from the drop-down list
8. In **Choose Release**, select the required release number.
9. In the **Content Type** filter, select one or both the following categories:
  - **Application & Technical Notes**
  - **Design, Development & System Mgt**

The list displays the product-specific Port Matrix document.

10. Press **Enter**.

## Avaya Documentation Center navigation

For some programs, the latest customer documentation is now available on the Avaya Documentation Center website at <https://documentation.avaya.com>.

### Important:

For documents that are not available on Avaya Documentation Center, click **More Sites > Support** on the top menu to open <https://support.avaya.com>.

Using the Avaya Documentation Center, you can:

- Search for keywords.

To filter by product, click **Filters** and select a product.

- Search for documents.

From **Products & Solutions**, select a solution category and product, and then select the appropriate document from the list.

- Sort documents on the search results page.
- Click **Languages** (🌐) to change the display language and view localized documents.
- Publish a PDF of the current section in a document, the section and its subsections, or the entire document.
- Add content to your collection using **My Docs** (☆).

Navigate to the **Manage Content > My Docs** menu, and do any of the following:

- Create, rename, and delete a collection.
- Add topics from various documents to a collection.
- Save a PDF of the selected content in a collection and download it to your computer.
- Share content in a collection with others through email.
- Receive collection that others have shared with you.
- Add yourself as a watcher using the **Watch** icon (👁).

Navigate to the **Manage Content > Watchlist** menu, and do the following:

- Enable **Include in email notification** to receive email alerts.
- Unwatch selected content, all content in a document, or all content on the Watch list page.

As a watcher, you are notified when content is updated or deleted from a document, or the document is removed from the website.

- Share a section on social media platforms, such as Facebook, LinkedIn, and Twitter.
- Send feedback on a section and rate the content.

 **Note:**

Some functionality is only available when you log in to the website. The available functionality depends on your role.

## Training

The following courses are available on <https://www.avaya-learning.com>. To search for the course, in the **Search** field, enter the course code and click **Go**.

| Course code | Course title                |
|-------------|-----------------------------|
| 20980W      | What's New with Avaya Aura® |

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## Viewing Avaya Mentor videos

Avaya Mentor videos provide technical content on how to install, configure, and troubleshoot Avaya products.

### About this task

Videos are available on the Avaya Support website, listed under the video document type, and on the Avaya-run channel on YouTube.

- To find videos on the Avaya Support website, go to <https://support.avaya.com/> and do one of the following:
  - In **Search**, type `Avaya Mentor Videos`, click **Clear All** and select **Video** in the **Content Type**.
  - In **Search**, type the product name. On the Search Results page, click **Clear All** and select **Video** in the **Content Type**.

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- To find the Avaya Mentor videos on YouTube, go to [www.youtube.com/AvayaMentor](http://www.youtube.com/AvayaMentor) and do one of the following:
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  - Scroll down Playlists, and click a topic name to see the list of videos available. For example, Contact Centers.

#### **Note:**

Videos are not available for all products.

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## Support

Go to the Avaya Support website at <https://support.avaya.com> for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions, or request an agent to connect you to a support team if an issue requires additional expertise.

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