



Overview of the Avaya G350 Media Gateway

555-245-201
Issue 3
January 2005

Copyright 2005, Avaya Inc.
All Rights Reserved

Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

Warranty

Avaya Inc. provides a limited warranty on this product. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya's standard warranty language as well as information regarding support for this product, while under warranty, is available through the following Web site: <http://www.avaya.com/support>.

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 may 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 Fraud Intervention

If you suspect that you are being victimized by toll fraud and you need technical assistance or support, in the United States and Canada, call the Technical Service Center's Toll Fraud Intervention Hotline at 1-800-643-2353.

Disclaimer

Avaya is not responsible for any modifications, additions or deletions to the original published version of this documentation unless such modifications, additions or deletions were performed by Avaya. Customer and/or End User agree to indemnify and hold harmless Avaya, Avaya's agents, servants and employees against all claims, lawsuits, demands and judgments arising out of, or in connection with, subsequent modifications, additions or deletions to this documentation to the extent made by the Customer or End User.

How to Get Help

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

- Within the United States, click the *Escalation Management* link. Then click the appropriate link for the type of support you need.
- Outside the United States, click the *Escalation Management* link. 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.

Standards Compliance

Avaya Inc. 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 Inc. 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 Inc. could void the user's authority to operate this equipment.

Product Safety Standards

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

Safety of Information Technology Equipment, IEC 60950, 3rd Edition, or IEC 60950-1, 1st Edition, including all relevant national deviations as listed in Compliance with IEC for Electrical Equipment (IECEE) CB-96A.

Safety of Information Technology Equipment, CAN/CSA-C22.2 No. 60950-00 / UL 60950, 3rd Edition, or CAN/CSA-C22.2 No. 60950-1-03 / UL 60950-1.

Safety Requirements for Customer Equipment, ACA Technical Standard (TS) 001 - 1997.

One or more of the following Mexican national standards, as applicable: NOM 001 SCFI 1993, NOM SCFI 016 1993, NOM 019 SCFI 1998.

The equipment described in this document may contain Class 1 LASER Device(s). These devices comply with the following standards:

- EN 60825-1, Edition 1.1, 1998-01
- 21 CFR 1040.10 and CFR 1040.11.

The LASER devices used in Avaya equipment typically operate within the following parameters:

Typical Center Wavelength	Maximum Output Power
830 nm - 860 nm	-1.5 dBm
1270 nm - 1360 nm	-3.0 dBm
1540 nm - 1570 nm	5.0 dBm

Luokan 1 Laserlaite

Klass 1 Laser Apparat

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposures.

Contact your Avaya representative for more laser product information.

Electromagnetic Compatibility (EMC) Standards

This product complies with and conforms to the following international EMC standards and all relevant national deviations:

Limits and Methods of Measurement of Radio Interference of Information Technology Equipment, CISPR 22:1997 and EN55022:1998.

Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement, CISPR 24:1997 and EN55024:1998, including:

- Electrostatic Discharge (ESD) IEC 61000-4-2
- Radiated Immunity IEC 61000-4-3
- Electrical Fast Transient IEC 61000-4-4
- Lightning Effects IEC 61000-4-5
- Conducted Immunity IEC 61000-4-6
- Mains Frequency Magnetic Field IEC 61000-4-8
- Voltage Dips and Variations IEC 61000-4-11

Power Line Emissions, IEC 61000-3-2: Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions.

Power Line Emissions, IEC 61000-3-3: Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems.

Federal Communications Commission Statement

Part 15:

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.

Part 68: Answer-Supervision Signaling

Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 rules. This equipment returns answer-supervision signals to the public switched network when:

- answered by the called station,
- answered by the attendant, or
- routed to a recorded announcement that can be administered by the customer premises equipment (CPE) user.

This equipment returns answer-supervision signals on all direct inward dialed (DID) calls forwarded back to the public switched telephone network. 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.

REN Number

For MCC1, SCC1, CMC1, G600, and G650 Media Gateways:

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 G350 and G700 Media Gateways:

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the rear of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. The digits represented by ## are the ringer equivalence number (REN) without a decimal point (for example, 03 is a REN of 0.3). If requested, this number must be provided to the telephone company.

For all media gateways:

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. 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.

REN is not required for some types of analog or digital facilities.

Means of Connection

Connection of this equipment to the telephone network is shown in the following tables.

For MCC1, SCC1, CMC1, G600, and G650 Media Gateways:

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	0.0B	RJ2GX, RJ21X
CO trunk	02GS2	0.3A	RJ21X
	02LS2	0.3A	RJ21X
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-IKN	6.0F	RJ48C, RJ48M
	04DU9-ISN	6.0F	RJ48C, RJ48M
120A4 channel service unit	04DU9-DN	6.0Y	RJ48C

For G350 and G700 Media Gateways:

Manufacturer's Port Identifier	FIC Code	SOC/REN/A.S. Code	Network Jacks
Ground Start CO trunk	02GS2	1.0A	RJ11C
DID trunk	02RV2-T	AS.0	RJ11C
Loop Start CO trunk	02LS2	0.5A	RJ11C
1.544 digital interface	04DU9-BN	6.0Y	RJ48C
	04DU9-DN	6.0Y	RJ48C
	04DU9-IKN	6.0Y	RJ48C
	04DU9-ISN	6.0Y	RJ48C
Basic Rate Interface	02IS5	6.0F	RJ49C

For all media gateways:

If the terminal equipment (for example, the media server or media gateway) 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 68 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. It is recommended that repairs be performed by Avaya certified technicians.

The equipment cannot be used on public coin phone service provided by the telephone company. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

This equipment, if it uses a telephone receiver, is hearing aid compatible.

Canadian Department of Communications (DOC) Interference Information

This Class A digital apparatus complies with Canadian ICES-003.

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

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

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. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Declarations of Conformity

United States FCC Part 68 Supplier's Declaration of Conformity (SDoC)
Avaya Inc. 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 on the following Web site: <http://www.avaya.com/support>.

All Avaya media servers and media gateways are compliant with FCC Part 68, but many have been registered with the FCC before the SDoC process was available. A list of all Avaya registered products may be found at: <http://www.part68.org> by conducting a search using "Avaya" as manufacturer.

European Union Declarations of Conformity



Avaya Inc. declares that the equipment specified in this document bearing the "CE" (*Conformité Européenne*) mark conforms to the European Union Radio and Telecommunications Terminal Equipment Directive (1999/5/EC), including the Electromagnetic Compatibility Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC).

Copies of these Declarations of Conformity (DoCs) can be obtained by contacting your local sales representative and are available on the following Web site: <http://www.avaya.com/support>.

Japan

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.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

To order copies of this and other documents:

Call: Avaya Publications Center
Voice 1.800.457.1235 or 1.207.866.6701
FAX 1.800.457.1764 or 1.207.626.7269

Write: Globalware Solutions
200 Ward Hill Avenue
Haverhill, MA 01835 USA
Attention: Avaya Account Management

E-mail: totalware@gwsmail.com

For the most current versions of documentation, go to the Avaya support Web site: <http://www.avaya.com/support>.

Contents

About this document	9
Purpose.	9
Audience	9
Downloading this book and updates from the Web	10
Downloading this book	10
Related resources	11
Technical assistance	11
Within the US.	11
International	11
Trademarks.	12
Sending us comments.	12
Chapter 1: Introduction	13
Features	13
What's New in Release 2.2	14
Modes of Deployment	15
Physical description.	16
Chapter 2: Optional components.	19
Supported media modules	19
S8300 media server	20
Telephony media modules	21
MM711 analog media module	21
MM714 analog media module	22
MM312 DCP media module	22
MM712 DCP media module	23
MM717 DCP media module	23
MM710 E1/T1 media module	23
MM720 BRI media module.	24
MM722 BRI media module.	24
WAN media modules	25
MM340 E1/T1 WAN media module	25
MM342 USP WAN media module	25
LAN media modules	26
MM314 LAN media module	26
Media module slot configurations	26
Permitted slots.	27
Combination limitations.	27

- Chapter 3: Summary of services 29**
 - Media gateway services 29
 - Voice over IP (VoIP) 30
 - Physical media 30
 - Telephones 30
 - Voice software 31
 - Outside telephone lines 31
 - Media Gateway Controllers 31
 - Supported media servers 32
 - Media server management 33
 - Additional features 34
 - Call center capabilities 34
 - Emergency Transfer Relay (ETR) 34
 - Contact closure 34
 - Fax, modem, TTY over IP 34
 - LAN services 35
 - Physical media 35
 - Power over Ethernet (PoE) 35
 - VLANs 36
 - Spanning Tree Protocol (STP) 36
 - Port mirroring 36
 - Port redundancy 36
 - WAN services 37
 - Physical media 37
 - WAN features 38
 - Routing features 40
- Chapter 4: Management. 41**
 - Management applications 41
 - Avaya G350 Command Line Interface 41
 - Avaya G350 Manager 42
 - Avaya Integrated Management 42
 - Avaya QoS Manager 42
 - Management access permissions 42
 - Alarms and troubleshooting 43
 - Front panel LEDs 43
 - Automatic error detection 43
 - SNMP 43
 - Packet Sniffing 44
 - VoIP Debugging using RTP-MIB 44

Chapter 5: Documentation	45
Appendix A: G350 capacities	47
Appendix B: Supported Avaya products.	51
Avaya IP telephones	51
Avaya DCP digital telephones	51
Avaya analog telephones	52
Appendix C: Technical specifications	53
G350 specifications	53
Media module specifications	54
Index	55

Contents

About this document

This document provides an overview of the Avaya G350 Media Gateway.

Purpose

This guide contains information that you need to consider before implementing the Avaya G350 Media Gateway. Use this guide to learn what the Avaya G350 Media Gateway can do and to plan how you will deploy the Avaya G350 Media Gateway in your environment.

This guide contains the following chapters:

- [Chapter 1: Introduction](#). Describes the features, applications and physical appearance of the G350.
- [Chapter 2: Optional components](#). Describes the optional media modules that slot into the G350 chassis. Also describes the limitations and capacities that apply to housing modules in the chassis. Use this chapter to decide on a suitable customized hardware configuration.
- [Chapter 3: Summary of services](#). Provides a summary of the telephone, LAN, and WAN services provided and supported by the G350.
- [Chapter 4: Management](#). Describes how you can manage the G350.
- [Chapter 5: Documentation](#). Describes the documentation available for the G350.
- [Appendix A: G350 capacities](#). Provides information about the capabilities of the G350. Consider the information in this chapter when deciding how to deploy the G350 in conjunction with other media gateways and equipment.
- [Appendix B: Supported Avaya products](#). Lists Avaya products supported by the G350 as end devices.
- [Appendix C: Technical specifications](#). Lists the technical specifications of the G350 and supported optional components and adjuncts.

Audience

The information in this book is intended for use by Avaya technicians, provisioning specialists, business partners, and customers.

Downloading this book and updates from the Web

You can download the latest version of *Avaya G350 Media Gateway Overview* from the Avaya Web site. You must have access to the Internet, and a copy of Acrobat Reader must be installed on your personal computer.

Avaya makes every effort to ensure that the information in this book is complete and accurate. However, information can change after we publish this book. Therefore, the Avaya Web site might also contain new product information and updates to the information in this book. You can also download these updates from the Avaya Web site.

Downloading this book

To download the latest version of this book:

1. Access the Avaya web site at <http://www.avaya.com/support>.
2. On the left side of the page, click **Product Documentation**.
The system displays the Welcome to Product Documentation page.
3. On the right side of the page, type **555-245-201**, and then click **Search**.
The system displays the Product Documentation Search Results page.
4. Scroll down to find the latest issue number, and then click the book title that is to the right of the latest issue number.
5. On the next page, scroll down and click one of the following options:
 - **PDF Format** to download the book in regular PDF format
 - **ZIP Format** to download the book as a zipped PDF file

Related resources

For more information on the Avaya G350 Media Gateway and related features, see the following books:

Title	Number
Installation and Upgrades for the Avaya G350 Media Gateway	03-300394
Avaya G350 Media Gateway Glossary	555-245-301
Administration of the Avaya G350 Media Gateway	555-245-501
Avaya G350 Media Gateway CLI Reference	555-245-202
Quick Start for Hardware Installation for the Avaya G350 Media Gateway	03-300148
Maintenance of the Avaya G350 Media Gateway	555-245-105

Technical assistance

Avaya provides the following resources for technical assistance.

Within the US

For help with:

- Feature administration and system applications, call the Avaya Technical Consulting Support System at 1-800-225-7585
- Maintenance and repair, call the Avaya National Customer Care Support Line at 1-800-242-2121
- Toll fraud, call Avaya Toll Fraud Intervention at 1-800-643-2353

International

For all international resources, contact your local Avaya authorized dealer.

Trademarks

All trademarks identified by ® or TM are registered trademarks or trademarks, respectively, of Avaya Inc. All other trademarks are the property of their respective owners.

Sending us comments

Avaya welcomes your comments about this book. To reach us by:

- Mail, send your comments to:
Avaya Inc.
Product Documentation Group
Room B3-H13
1300 W. 120th Ave.
Westminster, CO 80234 USA
- E-mail, send your comments to:
document@avaya.com
- Fax, send your comments to:
1-303-538-1741

Ensure that you mention the name and number of this book, *Overview of the Avaya G350 Media Gateway*, 555-245-201.

Chapter 1: Introduction

The Avaya G350 Media Gateway forms part of Avaya Enterprise Connect, Avaya's solution for extending communication capabilities from the headquarters of an organization to all collaborative branch locations. Avaya Enterprise Connect helps you provide the same high quality services to all organization members, regardless of their location.

The G350 is a high-performance converged telephony and networking device that sits in a small branch location, providing all infrastructure needs in one box — telephone exchange and data networking. The G350 is designed for use in a 16-24 user environment, but can support sites with up to 40 stations. The G350 features a VoIP engine, WAN router, and Power over Ethernet LAN switch, and provides full support for legacy digital and analog telephones.

The G350 integrates seamlessly with Avaya Media Servers S8700, S8710, S8500, and S8300, running Avaya Communication Manager call processing software to provide the same top quality telephony services to the small branch office as to the headquarters of the organization. The Media Server can be located at the headquarters and serve the G350 remotely.

The G350 can optionally house an internal Avaya S8300 media server as a local survivable processor or as the main media server for standalone deployment.

In addition to advanced and comprehensive telephony services, the G350 provides full data networking services, precluding the need for a WAN router or LAN switch.

The G350 is a modular device, adaptable to support different combinations of endpoint devices. Pluggable media modules provide interfaces for different types of telephones and trunks. A combination is selected to suit the needs of the branch.

A LAN media module with PoE standard compliant Ethernet ports provides support for IP telephones as well as all other types of data devices. A range of telephony modules provides full support for legacy equipment such as analog and digital telephones.

Features

The G350 features include:

- VoIP Media Gateway services
- Avaya Communication Manager media server management
- Dynamic Call Admission Control (CAC) for Fast Ethernet, Serial, and GRE tunnel interfaces
- Survivability features for continuous voice services
- Support for traditional telephones and trunks

Introduction

- Call center capabilities
- WAN Quality of Service (QoS)
- Weighted Fair Queuing (WFQ)
- Extensive alarming and troubleshooting features
- Fax and modem over IP
- Policy-based routing
- Port mirroring
- Port redundancy
- Power-over-Ethernet LAN Switching
- PPPoE
- SNMP traps (v1 and v2 only) sent to the primary controller
- SNMP v3
- Spanning Tree Protocols IEEE 802.1D (STP) and IEEE 802.1w (RSTP)
- Support for remote administration access using a modem
- Support for SSH and RADIUS Authentication
- VLANs
- VPN support
- WAN routing and connectivity

What's New in Release 2.2

Avaya G350 Media Gateway Release 2.2 includes the same functionality that was provided in Release 2.0, and offers the following new or enhanced capabilities:

- VPN support. VPN (Virtual Private Network) defines a private secure connection between two nodes on a public network such as the Internet. The G350 VPN feature is designed to support site-to-site topologies in which the two peers are Gateways.
- FIPS compliance. The Federal Information Processing Standard for cryptographic modules, FIPS-140-2, has become a *de facto* standard that governs the acquisition of all commercial off the shelf products to be used in systems handling US security information. In Release 2.2, the G350 cryptographic module meets the overall requirements applicable to Level 1 security of FIPS 140-2.
- TFTP IP phone upgrades. The Trivial File Transfer Protocol (TFTP) can be used to download configuration and firmware upgrade files to IP phones. The TFTP server stores the images and configuration files (upgrade and setting files) of the IP phones.

- PPPoE. The ETH WAN Fast Ethernet port on the G350 front panel can be configured for PPPoE (PPP over Ethernet) encapsulation, which enables the port to function as a WAN port. PPPoE offers dialup style authentication and accounting and allows subscribers to dynamically select their ISP.
- 802.1x authentication. The 802.1x protocol provides a means of authenticating and authorizing users attached to a LAN port and of preventing access to that port in cases where the authentication process fails. The 802.1x protocol uses Extensible Authentication Protocol (EAP) messages encapsulated within Ethernet frames (EAPOL), and EAP over RADIUS for communication between the Authenticator and the Authentication Server.
- PoE traps. Release 2.2 introduces the ability of the G350 to generate PoE traps per module, based on a defined power consumption threshold.
- RTP statistics application. The RTP statistics application is an application for debugging QoS-related problems across the VoIP network without any dedicated hardware. During each RTP stream, counters representing various QoS metrics increment whenever configured thresholds for the metrics are exceeded. A limited history of the QoS metric statistics is stored on the G350 for active and terminated RTP streams. Statistics can be displayed via the G350 CLI. In addition, the G350 can be configured to send SNMP traps to the SNMP trap manager on the media server at the termination of each RTP stream that has QoS problems. The traps are converted to syslog messages and stored for viewing in the messages file on the media server hard disk.
- DHCP server. Release 2.2 offers enhanced DHCP capabilities. In this release, the G350 can function as a DHCP server or as a DHCP relay or both simultaneously, with each interface configured in either DHCP server mode or DHCP relay mode. For example, you can configure the G350 to provide DHCP service to voice devices while DHCP requests by data devices are routed to a central remote DHCP server using DHCP relay.

Modes of Deployment

The G350 is a modular device with multiple configuration possibilities to meet specific individual needs. Six slots in the G350 chassis house a customized selection of media modules, which connect to different types of circuit switched phones, trunks, and data devices. One of the slots can house an internal media server. A major configuration choice is which type of media server to deploy. The media server may be a media module or a standalone device.

Introduction

The G350 can be deployed in one of two basic working modes:

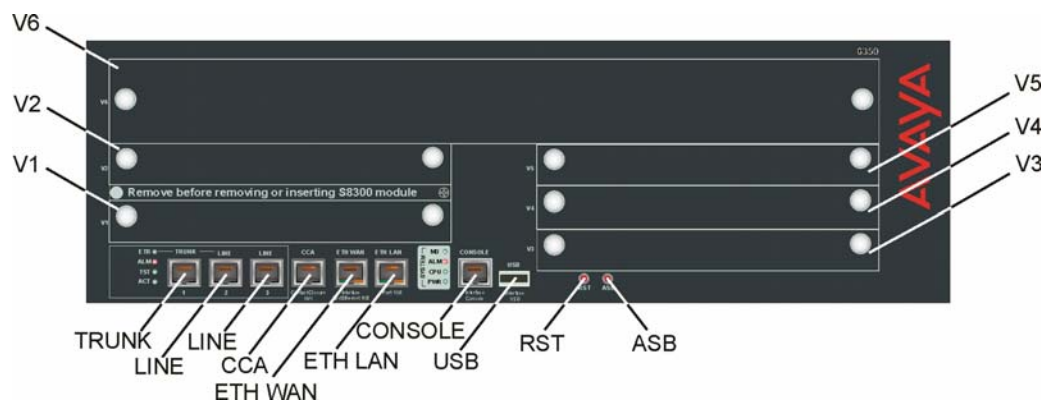
- Distributed Avaya Enterprise Connect. In this mode, the G350 is controlled by an external media server. This may be a standalone media server, such as the S8500, S8700 or S8710, or a separate media gateway in a standalone configuration. The G350 may also house an S8300 Media Server module to function as a Local Survivable Processor (LSP), which can take over control of the G350 if the external media server stops serving the G350.
- Standalone. In this mode, the G350 is controlled by an internally housed S8300 Media Server module.

Multiple G350s may be deployed in many remote branches of a large organization. Large branches or main offices may deploy an Avaya G700 Media Gateway, which provides similar functionality to the G350 for a larger number of users. Up to 250 G350 and G700 Media Gateways may be controlled by a single external S8700 Media Server.

Physical description

The following figure shows the G350 chassis:

Figure 1: The Avaya G350 Media Gateway Chassis



The chassis features:

- Six media module slots, V1 to V6
- Fixed ports and buttons

For information about the different media modules that can be housed in the media module slots, see [Chapter 2: Optional components](#). The following tables describe the functions of the fixed ports and buttons on the G350 front panel.

Table 1: Fixed ports on the G350 front panel

Port	Description
TRUNK	An analog trunk port. Part of an integrated analog media module.
LINE, LINE	Analog telephone ports of the integrated analog media module. An analog relay between TRUNK and the furthest left LINE port provides Emergency Transfer Relay (ETR) feature.
CCA	RJ-45 port for ACS (308) contact closure adjunct box.
ETH WAN	RJ-45 10/100 Base TX Ethernet port.
ETH LAN	RJ-45 Ethernet LAN switch port.
CONSOLE	Console port for direct connection of CLI console. RJ-45 connector.
USB	USB port. Supports the connection of the Multitech MultiModemUSB MT5634ZBA-USB-V92 USB modem.

Table 2: Buttons on the G350 front panel

Button	Description
RST	Reset button. Resets chassis configuration.
ASB	Alternate Software Bank button. Reboots the G350 with the software image in the alternate bank.

Chapter 2: Optional components

The Avaya G350 Media Gateway is a versatile device with powerful capabilities. To implement the various services that are supported, a variety of swappable internal components called media modules are available. This chapter describes:

- [Supported media modules](#). Describes all media modules available for the G350.
- [Media module slot configurations](#). Describes how the media modules can be combined in the chassis.

Supported media modules

The G350 supports the following Avaya media modules:

Table 3: Supported media modules 1 of 2

Media module	Description
S8300	Media server
Telephony media modules	
MM711	8 universal analog ports
MM714	4 analog telephone ports and 4 analog trunk ports
MM312	24 DCP telephone ports
MM712	8 DCP telephone ports
MM717	24 DCP telephone ports
MM710	1 T1/E1 ISDN PRI trunk port
MM720	8 ISDN BRI trunk ports
MM722	2 ISDN BRI trunk ports
WAN media modules	
MM340	1 E1/T1 WAN port
MM342	1 USP WAN port

1 of 2

Table 3: Supported media modules 2 of 2

Media module	Description
LAN media modules	
MM314	24 10/100 Ethernet ports with Power over Ethernet (PoE)
2 of 2	



CAUTION:

The MM312, MM314, MM340, MM342, are not supported by the Avaya G700 Media Gateway. Do not insert an MM312, MM314, MM340, MM342, MM714 or MM722 media module into an Avaya G700 Media Gateway.

Each media module is described in a section below.

S8300 media server

The S8300 media server is a Pentium-based processor that runs a Linux operating system. The S8300 runs Avaya Communication Manager (ACM) to provide call control services to the G350. The G350 is compatible with ACM 2.1 and backwards compatible with ACM 2.0.

The S8300 media server features:

- Avaya Native Configuration Manager. An administration tool that provides terminal emulation capabilities and a variety of connectivity options you can save and reuse.
- A 30GB hard disk.
- 512 MB RAM.
- A WEB server used for the following:
 - Backups and restores for customer data.
 - Easy access to view current alarms.
 - The ability to perform server maintenance, shutdown, and status of the S8300 Media Server.
 - Security commands that can enable and disable the modem, start and stop the FTP server, and view the software license.
 - SNMP access to configure trap destinations and stop and start the master agent.
 - S8300 Media Server configuration information and upgrade access.
 - The facility to download the Avaya Native Configuration Manager from the S8300 Media Server to a PC on the LAN.
- Linux operating system (Redhat v8.x).

- Interface for IA770 INTUITY AUDIX Messaging, a software-only version of INTUITY AUDIX messaging that resides on the hard drive of the S8300 Media Server. See the description of the S8300 Media Server in the Hardware Guide for Avaya Communication Manager, 55-245-207, for more information.
- Trivial File Transfer Protocol (TFTP) server.
- H.248 Media Gateway Signaling Protocol.
- Control messages tunneled over H.323 Signaling Protocol.
- One 10/100Base-T Ethernet switch port used as a Services port.
- Two USB ports for modem connections.
- SNMP alarming.
- Support for remote call out alarming.

Figure 2: The S8300 media module



Telephony media modules

MM711 analog media module

The MM711 provides analog trunk and telephone features and functionality.

The administrator can configure any of the eight ports of the MM711 as follows:

- Central office trunk, either loop start or ground start
- Analog Direct Inward Dialing (DID) trunks, either wink start or immediate start
- 2-wire analog Outgoing CAMA E911 trunks for connectivity to the PSTN
- MF signaling is supported for CAMA ports
- Analog, tip/ring devices, such as single-line telephones with or without LED message waiting indication

The MM711 also supports:

- Three ringer loads (ringer equivalency number) for up to 2000 feet for all eight ports
- Up to eight simultaneously-ringing ports

Note:

The media gateway achieves this number of ports by staggering the ringing and pauses between two sets of up to four ports.

Optional components

- Type 1 Caller ID
- Ring voltage generation for a variety of international frequencies and cadences

Figure 3: The MM711 media module



MM714 analog media module

The MM714 analog media module provides 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 4: The MM714 media module



MM312 DCP media module

The MM312 DCP media module provides 24 Digital Communications Protocol (DCP) ports with RJ-45 jacks. The MM312 supports simultaneous operation of all 24 ports. Each port can be connected to a two-wire DCP telephone. See [Appendix B: Supported Avaya products](#) for a list of compatible DCP telephones.

The MM312 does not support four-wire DCP telephones.

Figure 5: The MM312 media module



MM712 DCP media module

The MM712 DCP media module provides eight DCP telephone ports. The ports support two-wire Digital Communications Protocol (DCP) telephones. See [Appendix B: Supported Avaya products](#) for a list of compatible DCP telephones.

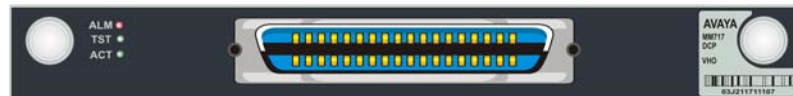
Figure 6: The MM712 media module



MM717 DCP media module

The MM717 DCP media module provides 24 DCP ports of two-wire DCP functionality exposed as a single 25-pair amphenol connector. The DCP ports are exposed by connecting the module via a standard amphenol cable to a punch-down block with RJ-11 jacks. The MM717 allows you to use one of the smaller media module slots for a large number of DCP telephones.

Figure 7: The MM717 media module



MM710 E1/T1 media module

The MM710 T1/E1 media module terminates a T1 or E1 trunk. The MM710 has a built-in Channel Service Unit (CSU) so an external CSU is not necessary. The CSU is only used for the T1 circuit.

The MM710 features:

- ISDN PRI capability (23B + D or 30B + D)
- Trunk signaling to support US and International CO or tie trunks
- Echo cancellation in either direction

Figure 8: The MM710 media module



MM720 BRI media module

The MM720 BRI media module contains eight ports that interface with the central office at the ISDN T reference point. On each port, information is communicated in two ways:

- Over two 64 Kb channels called B1 and B2 that can be circuit switched simultaneously
- Over a 16 Kb channel called the D channel that is used for signaling

The circuit switched connections have a u-law or A-law option for voice operation.

Figure 9: The MM720 media module



Note:

The MM720 media module does not support:

- BRI stations
- Combining both B channels together to form a 128-kbps channel

MM722 BRI media module

The MM722 BRI media module provides two 4 wire S/T ISDN BRI (Basic Rate Interface) 2B+D access ports with RJ-45 jacks. Each port interfaces to the central office at the ISDN T reference point. Information is communicated in the same manner as for the MM720. See [MM720 BRI media module](#) on page 24.

Figure 10: The MM722 media module



Note:

The MM722 media module does not support:

- BRI stations
- Combining both B channels together to form a 128-kbps channel

WAN media modules

MM340 E1/T1 WAN media module

The MM340 E1/T1 WAN media module provides a WAN access port for the connection of an E1 or T1 WAN.

Figure 11: The MM340 media module



MM342 USP WAN media module

The MM342 media module provides one USP WAN access port. MM342 supports the following WAN protocols:

- V.35/ RS449
- X.21

For these connections, one of the following cables is necessary:

- Avaya Serial Cable DTE V.35 (USP to V.35)
- Avaya Serial Cable DTE X.21 (USP to X.21)

Figure 12: The MM342 media module



LAN media modules

MM314 LAN media module

The MM314 LAN media module provides:

- 24 Ethernet 10/100 Base-T Ethernet access ports with inline Power over Ethernet (PoE).
- One Gigabit Ethernet Small Form-Factor Pluggables (SFP) GigaBit Interface Converter (GBIC) slot which supports any of the following SFP GBICs: 1000-SX, 1000-LX, 1000-ELX, or 1000-TX.

The MM314 supports 48V DC inline power provided over standard category 5 UTP cables (up to 100m range) on each PoE port.

The MM314 features:

- Priority power budgeting with configurable priorities
- Automatic load detection on ports
- Automatic device discovery
- Enable/disable port powering option
- Port monitoring
- Automatic recovery from overload shutdown
- Automatic recovery from no-load shutdown

Figure 13: The MM314 media module



For more information about PoE, see [Power over Ethernet \(PoE\)](#) on page 35.

Media module slot configurations

When choosing a combination of media modules to install in the G350 chassis, consider the slots in which each module type can be housed, and the limitations and recommendations regarding combinations of media modules.

Permitted slots

The G350 chassis has six media module slots, marked V1, V2, V3, V4, V5, V6 (see [Physical description](#) on page 16). Each media module is restricted to certain slots.

The following table shows in which slots each media module can be installed.

Table 4: Permitted slots for media modules

Media module	Permitted slots
MM312	V6
MM314	V6
MM340	V2, V3, V4, V5
MM342	V2, V3, V4, V5
MM710	V1, V2, V3, V4, V5
MM711	V1, V2, V3, V4, V5
MM712	V1, V2, V3, V4, V5
MM714	V1, V2, V3, V4, V5
MM717	V1, V2, V3, V4, V5
MM720	V1, V2, V3, V4, V5
MM722	V1, V2, V3, V4, V5
S8300	V1

Combination limitations

The following limitations apply to combining media modules in the G350

- Maximum of one MM710 media module
- Maximum of three of the following voice media modules in any combination: MM710, MM711, MM712, MM720, MM714, MM717, or MM722, subject to the following limitations:
 - Maximum of one MM710
 - Maximum of one of the following modules: MM712 and MM717 (you can combine this module with an MM312)

Optional components

Chapter 3: Summary of services

This chapter provides a summary of the services offered by the G350. It contains the following sections:

- [Media gateway services](#). Describes the services the G350 provides as a Media Gateway.
- [LAN services](#). Describes the LAN services provided by the G350.
- [WAN services](#). Describes the WAN services provided by the G350.

Media gateway services

The G350 provides a telephone exchange service, supporting the connection of various types of telephones and outside telephone lines. Telephones and lines are connected to the G350 via ports and media modules on the chassis. Different media modules provide access ports for different types of telephones and lines.

Telephony services are controlled by a media gateway controller running Avaya Communication Manager call processing software. The media gateway controllers compatible with the G350 are called Media Servers. You can use the Avaya Communication Manager to configure many advanced telephone exchange functions. For more information, see the *Administrator's Guide for Avaya Communication Manager*, 555-233-506.

This section describes the services the G350 provides as a Media Gateway. It contains the following sections:

- [Voice over IP \(VoIP\)](#). Describes G350 VoIP services.
- [Physical media](#). Describes supported telephones and trunks, and the fixed ports or media modules required to connect them.
- [Media Gateway Controllers](#). Describes supported Media Gateway Controllers, how you can configure and manage them, and survivability features provided by the G350.
- [Additional features](#). Describes the emergency transfer relay function and the contact closure function.

Voice over IP (VoIP)

The G350 features a VoIP engine that provides voice services over IP data networks.

You can use many types of telephones and trunks that do not directly support VoIP. The G350 translates voice and signalling data between VoIP and the system used by the telephones and trunks, as follows: Avaya media modules convert the voice path of traditional circuits such as analog trunk, T1/E1, and DCP to a TDM bus inside the G350. The VoIP engine then converts the voice path from the TDM bus to a compressed or uncompressed and packetized VoIP on an Ethernet connection.

The G350 provides VoIP services over the LAN and WAN. The G350 supports the G.711 codec for up to 32 concurrent calls and the G.729 codec for up to 16 concurrent calls.

Physical media

This section describes the various types of telephones and lines supported by the G350 and the access ports provided for their connection.

Telephones

The G350 supports IP telephones, Avaya DCP telephones, and analog telephones. For information about which Avaya telephones are supported, see [Appendix B: Supported Avaya products](#).

Telephones must be connected to the correct type of port for the telephone type. Different types of telephone ports are provided by different media modules and by fixed ports on the G350 front panel. The table below lists which ports you can use to connect each type of telephone. See [Chapter 2: Optional components](#) for more information about each type of port and media module.

Table 5: Telephones supported and ports provided

Telephone type	Ports
IP telephones	Switched Ethernet ports on the MM314 PoE media module.
Avaya DCP digital telephones	DCP ports on the MM312, MM712, and MM717 media modules.
Analog telephones	Analog line ports on the MM711 and MM714 analog media modules. Fixed analog telephone ports LINE and LINE (see Physical description on page 16).

Voice software

The G350 supports telephone calls between a computer on the network running Avaya Softphone software and analog or DCP telephones connected to the G350.

Outside telephone lines

The table below lists which modules you can use to connect each type of outside line. See [Chapter 2: Optional components](#) for more information about each type of port and media module.

Table 6: Outside telephone lines supported and ports provided

Line Type	Ports
ISDN line	ISDN ports on the MM720 and MM722 BRI media modules.
Analog trunks	Analog trunk ports on the MM714 analog media module. Fixed analog trunk port, TRUNK (see Physical description on page 16).
T1/E1 voice lines	The T1/E1 port on the MM710 T1/E1 media module.

Media Gateway Controllers

A Media Gateway Controller (MGC) controls telephone services on a Media Gateway. An MGC may be internal to the Media Gateway or external to the Media Gateway. An Internal Call Controller (ICC) is an internal MGC. An External Call Controller (ECC) is an external MGC that communicates with the G350 over the network.

An Avaya media server managed with Avaya Communication Manager software acts as an MGC for the G350.

Supported media servers

The media servers supported by G350 include both ECCs and ICCs. The Avaya G350 Media Gateway supports the following media servers:

Table 7: Media servers supported by the Avaya G350 Media Gateway

Media server	Type	Usage
Avaya S8300 Media Server	Media module	ICC (if installed in the G350) or ECC (if installed in a G700 Media Gateway on the network)
Avaya S8500 Media Server	External	ECC
Avaya S8700 Media Server	External	ECC
Avaya S8710 Media Server	External	ECC

See [Chapter 2: Optional components](#) for information about the S8300 Media Server module.

The G350 provides the following configuration options to help you ensure continuous telephone services:

- You can configure an S8300 installed in the G350 as a Local Survivable Processor (LSP). In this configuration, the S8300 takes over to provide continuous telephone service if all external media servers become unavailable. Calls in progress continue without interruption when the S8300 takes over.
- You can configure the G350 to use up to four media servers. If the Media Gateway Controller is an S8700 or S8710, the first server on the list will normally be the primary CLAN board connected to the media server. The remaining servers will be alternate CLAN boards connected to the media server or LSPs, if any. If the Media Gateway Controller is an S8500 or S8300, the first server on the list will be the Media Gateway Controller, and the remaining servers will be LSPs, if any.
- G350 features a dynamic trap manager, which allows you to ensure that the G350 sends traps directly to the currently active media server. If the media server fails, dynamic trap manager ensures that traps are sent to the backup media server.

Media server management

The media server is managed by the Avaya Communication Manager. The G350 supports Avaya Communication Manager release 2.1 and is backwards compatible with release 2.0.

Avaya Communication Manager is an open, scalable, highly reliable and secure telephony application. Avaya Communication Manager provides user and system management functionality, intelligent call routing, application integration and extensibility, and enterprise communications networking. Avaya Communication Manager offers over 500 features, in the following categories:

- Telephony features
- Localization
- Collaboration
- Mobility
- Messaging
- Telecommuting
- System management
- Reliability
- Security, privacy, and safety
- Hospitality
- Attendant features
- Networking
- Intelligent call routing
- Application programming interfaces

Use Avaya Communication Manager software to:

- Determine where to connect your telephone call based on the number you dial
- Assign numbers to local telephones
- Play dial tones, busy signals, and prerecorded voice announcements
- Allow or prohibit access to outside lines for specific telephones
- Assign telephone numbers and buttons to special features
- Exchange call switching information with older telephone switches that do not support VoIP

For more information about Avaya Communication Manager software, see *Administrator's Guide for Avaya Communication Manager*, 555-233-506.

Additional features

The G350 also provides the following voice related features:

Call center capabilities

The G350 supports call center features according to the mode of deployment (see [Modes of Deployment](#) on page 15):

- Distributed Avaya Enterprise Connect mode. The G350 supports up to ten concurrent call center agents. This configuration is supported by CM 2.0 applications.
- Standalone mode. The G350 supports a call center application with up to ten concurrent agents. This application is supported by CM 2.1 and above.

Emergency Transfer Relay (ETR)

The Emergency Transfer Relay (ETR) feature provides basic telephone services in the event of a power outage or a failed connection to Avaya Communication Manager. Using ETR, you can connect the fixed analog trunk port (TRUNK) to one of the fixed analog line ports (LINE 1). An outside telephone exchange can be connected to the trunk port, and an analog telephone can be connected to the line port. All calls are then directed by the analog relay between the outside line and the analog telephone. A current-loop detection circuit prevents ongoing calls from being disconnected when normal functioning resumes.

Contact closure

The contact closure feature is a controllable relay providing dry contacts for various applications. To implement the contact closure feature, you connect an Avaya Partner Contact Closure Adjunct box to the CCA port on the G350 chassis. 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.

Fax, modem, TTY over IP

The G350 supports fax, modem and TTY over IP.

LAN services

You can use the Avaya G350 Media Gateway as a LAN switch. You can also integrate the Avaya G350 Media Gateway into an existing LAN. This section provides a summary of the LAN switching services provided by the G350, including:

- [Physical media](#). Describes the LAN access ports available for providing LAN services to data devices
- [Power over Ethernet \(PoE\)](#). Describes the Power over Ethernet feature supported by the G350
- [VLANs](#). Describes VLAN features supported by the G350
- [Spanning Tree Protocol \(STP\)](#). Lists the STPs supported by the G350
- [Port mirroring](#). Describes the port mirroring function supported by the G350
- [Port redundancy](#). Describes the port redundancy feature supported by the G350.

Physical media

G350 provides LAN services through the following Ethernet ports for the connection of local data devices:

- Switched LAN ports. Configurable switched Ethernet ports on the MM314 media module. See [MM314 LAN media module](#) on page 26.
- Fixed LAN port. The fixed configuration LAN port on the chassis, connected to the internal LAN switch. The fixed LAN port supports HP auto-MDIX, which automatically detects and corrects the polarity of crossed cables. This results in simplified LAN installation and maintenance.

Power over Ethernet (PoE)

The MM314 media module ports provide power to data devices over the Ethernet connection. The ports support the connection of IP phones and wireless access points, which you may want to power through the G350.

The inline PoE feature enables you to power data devices through the G350. Power is distributed between the 24 PoE ports, according to configured priorities. You configure the power priority on each port. Distribution is calculated from the actual power consumption.

An automatic discovery system detects when powered devices are connected to and removed from the PoE ports. Automatic load detection:

- Tests whether the device connected to the port requires remote powering
- Controls the power injection to the wires

VLANs

You can configure VLANs on the G350's fixed LAN port and on the MM314 ports. The G350 supports up to eight VLANs.

The following VLAN features are supported:

- VLAN port grouping. Up to 15 port VLANs can be used to group LAN ports into logical groups.
- Ingress VLAN Security. You configure a list of ingress VLANs on each port. Any packets tagged with an unlisted VLAN are dropped when received on the port.
- Class of Service (CoS) tagging. Packets are tagged with VLANs per CoS.
- Inter-VLAN routing. You can configure specific VLANs to permit access to the WAN while others can be configured to deny access to the WAN.

Spanning Tree Protocol (STP)

The IEEE 802.1D (STP) and IEEE 802.1w (RSTP) Spanning Tree Protocols are supported on the MM314 switched LAN ports.

Port mirroring

The G350 supports network traffic monitoring by port mirroring. You can configure port mirroring on any LAN port. You implement port mirroring by connecting an external traffic probe device to one of the LAN ports. The probe device monitors traffic that is sent and received through other ports by copying the packets and sending them to the monitor port. Port mirroring is only supported on the 24 Fast Ethernet ports on the MM314 media module.

Port redundancy

You can configure port redundancy on the G350. Port redundancy allows you to provide both a primary link and a backup link to an important resource. Port redundancy is supported between any two PoE ports on the MM314 media module.

WAN services

The G350 has an internal router and provides direct access to outside WAN lines. You can use the G350 as the endpoint device for a WAN line. You can also use the G350 as the router for a WAN line with an external endpoint device.

This section describes the WAN services provided by the G350. It contains the following sections:

- [Physical media](#)
- [WAN features](#)
- [Routing features](#)

Physical media

To use the G350 as the endpoint device for a WAN, you install a media module, and connect the WAN line to a port on the media module. When you connect a WAN line to a media module, the Avaya G350 Media Gateway serves as the router for the WAN line.

You can also use the fixed ETH WAN Fast Ethernet port as a WAN endpoint by configuring the port's interface for PPPoE encapsulation.

To use the G350 as a router, you connect the external endpoint device to the fixed WAN port on the G350 front panel using a standard network cable. See [Physical description](#) on page 16 for the location of the WAN port on the G350 front panel.

You can also use the fixed WAN port to connect a computer or other endpoint data device to the G350.

The G350 supports the following types of WAN line:

- E1/T1
- USP
- PPPoE

Summary of services

The table below lists which media modules to install to connect each type of outside WAN line. For more information about each type of media module, see [Chapter 2: Optional components](#).

Table 8: Outside WAN lines supported and matching media modules

WAN line	Media modules
USP	MM342
E1/T1 data lines	MM340
PPPoE	Chassis

WAN features

The G350 supports the following WAN features:

- Traffic shaping. The traffic shaping function estimates the parameters of the incoming traffic and takes action if it measures traffic exceeding agreed parameters. The action could be to drop the packets or mark them as being high drop priority.
- PPP over channeled and fractional E1/T1. The G350 has the ability to map several PPP sessions to a single E1/T1 interface.
- PPP over USP.
- PPPoE.
- Unframed E1 for enabling full 2.048 Mbps bandwidth usage.
- Point-to-Point Frame Relay encapsulation over channelized/fractional/unframed E1/T1 ports or over a USP interface.
- Frame Relay LMI types supported: ANSI (Annex D), ITU-T:Q-933 (Annex A0), LMI-Rev1, and No LMI.
- Backup functionality supported between any type of Serial Layer 2 interface.
- Dynamic Call Admission Control (CAC) for Fast Ethernet, Serial, and GRE tunnel interfaces. Dynamic CAC provides enhanced control over WAN bandwidth. When Dynamic CAC is enabled on an interface, the G350 informs the MGC of the actual bandwidth of the interface and tells the MGC to block calls when the bandwidth is exhausted.
- Quality of Service (QoS). The G350 uses Weighted Fair VoIP Queuing (WFVQ) as the default queuing mode for WAN interfaces. WFVQ combines weighted fair queuing (WFQ) for data streams and priority VoIP queuing to provide the real-time response time that is required for VoIP. The G350 also supports the VoIP Queue and Priority Queue legacy queuing methods.

- Weighted Random Early Detection (WRED). The G350 uses WRED on its ingress and egress queues to improve the performance of the network when overloaded. The purpose of WRED is to indicate to transmitting hosts to reduce their transmission speed when the ingress G350 queues are congested.
- Policy. Each interface on the G350 can have four active policy lists:
 - Ingress Access Control List.
 - Ingress QoS List.
 - Egress Access Control List.
 - Egress QoS List.

Access control lists define which packets should be forwarded or denied access to the network. QoS lists change the DSCP and 802.1p priority of routed packets according to the packet characteristics.

- Policy-based routing. The G350 features policy-based routing, which uses a policy list structure to implement a routing scheme based on traffic source, destination, type, and other characteristics. You can use policy-based routing lists (PBR lists) to determine the routing of packets that match the rules defined in the list. Common applications include separate routing for voice and data traffic, routing traffic originating from different sets of users through different Internet connections (Internet Service Providers), and defining backup routes for defined classes of traffic.
- RTP Header Compression. The G350 saves up to 60% of the bandwidth necessary using RTP compression. It also enhances the efficiency of voice transmission over the network by compressing the headers of Real Time Protocol (RTP) packets, thereby minimizing the overhead and the delays involved in RTP implementation.

Routing features

The G350 has an internal router. You can configure the following routing features on the router:

- Interfaces
- Routing table
- VPN
- GRE tunneling
- DHCP and BOOTP relay
- DHCP server
- Broadcast relay
- ARP table
- ICMP errors
- RIP
- OSPF
- Route redistribution
- VRRP
- Fragmentation
- Static routes
- Policy based routing
- Distribution lists

Chapter 4: Management

This chapter describes how you can manage the G350. It contains the following sections:

- [Management applications](#)
- [Management access permissions](#)
- [Alarms and troubleshooting](#)

Management applications

The Avaya G350 Media Gateway can be managed using any of the following applications:

- The Avaya G350 Command Line Interface
- Avaya G350 Manager
- Avaya Integrated Management
- Avaya QoS Manager

Avaya G350 Command Line Interface

You can use the Avaya G350 Media Gateway CLI to configure the Avaya G350 Media Gateway and media modules. The CLI is a textual command prompt interface. It is similar to the CLI of many other network devices.

You can access the CLI with any of the following:

- Telnet through the network
- Telnet through dialup, using a dialup PPP network connection
- A console device connected to the CON port on the G350 front panel
- SSH (Secure Shell), which enables you to establish a remote session over a secured tunnel

For information about each command in the CLI, see the *Avaya G350 Media Gateway CLI Reference*, 555-245-202.

For information about how to use the CLI to perform specific configuration tasks, see *Administration of the Avaya G350 Media Gateway*, 555-245-501.

Avaya G350 Manager

Avaya G350 Manager is a web-enabled graphical administration tool for configuring a single G350 device. You can use Avaya G350 Manager to configure the G350 chassis and media modules. You can also use it for status monitoring and troubleshooting. You can open Avaya G350 Manager in one of the following ways:

- From Avaya Integrated Management software
- From a Web browser on a computer on the same network as the G350

For information about the Avaya G350 Manager, see the *Avaya G350 Manager User Guide*, 650-100-709.

For information about how to use the Avaya G350 Manager to perform specific configuration tasks, see *Administration of the Avaya G350 Media Gateway*, 555-245-501.

Avaya Integrated Management

Avaya Integrated Management offers a comprehensive set of web-based network and system management solutions that support Avaya converged voice solutions. You can use Avaya Integrated Management to monitor SNMP traps on the G350. You can also use Avaya Integrated Management to access Avaya G350 Manager.

Avaya QoS Manager

You can use Avaya QoS Manager to configure G350 QoS policy capabilities.

You can access Avaya QoS Manager through Avaya Integrated Management software.

Management access permissions

To use any management functions, the user must have a user name and password. Each user name is associated with one of three privilege levels: read-only, read-write, and administrator.

Alarms and troubleshooting

The G350 has extensive features for error detection, alarming and troubleshooting. Detailed diagnostic information and troubleshooting are provided by software-based solutions accessible by laptops in the field or remotely from an administrator's computer. *Maintenance of the Avaya G350 Media Gateway*, 555-245-105, provides a comprehensive guide to accessing and using those solutions. Alarming and troubleshooting features include:

- [Front panel LEDs](#)
- [Automatic error detection](#)
- [SNMP](#)
- [Packet Sniffing](#)

Front panel LEDs

LEDs on the front panel of the G350 and media modules give a quick overall understanding of the health of the system and subsystems. When alarms or problems occur, LEDs indicate that attention by a technician is needed.

Automatic error detection

During normal operations, software or firmware automatically detects and attempts to fix or circumvent error conditions. The system automatically attempts either to fix or circumvent these problems. Errors are detected in two ways:

- Firmware on a system component during ongoing operations
- A "periodic test" or a "scheduled test" started by software

A technician can run more comprehensive tests on demand.

SNMP

The G350 reports alarms using SNMP traps. The G350 supports SNMP versions SNMPv1, SNMPv2c, and SNMPv3.

Packet Sniffing

The G350 features packet sniffing. All packets, including non-Ethernet packets, that pass through the G350, are recorded. The recorded packets are stored in a file that can be uploaded either to the Media Server or to a PC and read by Ethereal for troubleshooting purposes.

VoIP Debugging using RTP-MIB

The G350 includes the RTP-MIB for debugging QoS-related problems across the VoIP network without any dedicated hardware. During each RTP stream, counters representing various QoS metrics increment whenever configured thresholds for the metrics are exceeded. A limited history of the QoS metric statistics is stored on the G350 for active and terminated RTP streams. Statistics can be displayed via the G350 CLI. In addition, the G350 can be configured to send SNMP traps to the SNMP trap manager on the media server at the termination of each RTP stream that has QoS problems. The traps are converted to syslog messages and stored for viewing in the messages file on the media server hard disk.

Chapter 5: Documentation

The following documentation is available to help you implement the G350 in your environment:

- *Installation and Upgrades for the Avaya G350 Media Gateway*, 03-300394. Describes how to install and upgrade the G350, prepare the G350 for software configuration, and perform some basic configurations. This guide describes how to insert media modules and connect external devices to the G350 and media module ports.
- *Quick Start for Hardware Installation for the Avaya G350 Media Gateway*, 03-300148. A concise installation guide covering assembly and basic configuration of the G350.
- *Administration of the Avaya G350 Media Gateway*, 555-245-501. Describes how to configure and manage the G350 after it is already installed. This guide contains detailed information about all the features of the G350 and how to implement them.
- *The Avaya G350 Manager User Guide*, 650-100-709. Describes how to use the Avaya G350 Manager software to manage the G350.
- *Avaya G350 Media Gateway CLI Reference*, 555-245-202. Describes the commands in the Avaya G350 CLI.
- *Maintenance of the Avaya G350 Media Gateway*, 555-245-105. Describes the tasks and procedures you perform to maintain and troubleshoot the G350 Media Gateway with a Media Server.
- *Avaya G350 Media Gateway Glossary*, 555-245-301. Defines terms used throughout the Avaya G350 documentation.

Appendix A: G350 capacities

The following table shows you the maximum media gateway capacities supported by the G350.



CAUTION:

Some capacities may change. For the most up-to-date list, see *System Capacities Table for Avaya Communication Manager on Avaya Media Servers*, 555-245-601.

Table 9: G350 gateway capacities 1 of 2

Description	Capacity	Comments
Maximum number of G350 Media Gateways controlled by an external S8300, S8500, or S8700 Media Server	250	This number also applies if a combination of Avaya G700 Media Gateways and G350 Media Gateways are controlled by the same external media server.
Maximum number of G350 Media Gateways controlled by a S8300 media server installed in an external media gateway.	50	
Maximum total number of telephones supported by the G350	40	
Maximum number of IP telephones	40	Limited by the number of VoIP resources used and the calling patterns (VoIP to VoIP conferencing, VoIP to non-VoIP, etc.)
Maximum number of analog phones	18	
Maximum number of DCP phones	40	
Maximum number of DCP and analog phones	40	
Maximum Number of All Trunks of Any Type	40	
Maximum Number of Analog Trunks	17	
		1 of 2

Table 9: G350 gateway capacities 2 of 2

Description	Capacity	Comments
Maximum Number of E1/ T1 Voice Trunks	30	
Maximum Number of WAN Routing IP Trunks	15	
Maximum of all TDM Endpoints and Trunks (Analog, DCP, T1/E1 voice, ISDN)	80	
Simultaneous two-way conversations from IP phone to legacy telephone or trunk.	32 – G.711 16 – G.729a/ G723	Simultaneous two-way conversations limited by the VoIP engine, including call progress tones.
Transcoding from G.711 to G.729 for IP phones	16	Simultaneous 2-way conversations
Transcoding from TDM phones to G.729 IP phones	16	Simultaneous 2-way conversations. The quantity of 16 applies to conversations where one end of each conversation is on a G350 and transcoding occurs for that endpoint on the G350. If transcoding must occur on both ends of the conversation, the quantity of conversations is 10.
Miscellaneous		
Fax capacity	8	Simultaneous fax transmissions using VoIP resources
Touch-tone recognition (TTR)	15	Receivers
Tone Generation	15	
Announcements (VAL)	5	Channels for playing announcements
	1	Channel for recording announcements
		2 of 2

The S8300 media server module offers the following maximum capacities.

Table 10: S8300 capacities

Item	Quantity Supported
Number of Users per S8300	450
Number of Trunks per S8300	450
Total Endpoints (Trunks and Users) per S8300	900
MGs per S8300	50
LSPs per S8300	50
MGs per LSP	50
Announcement Sources per S8300	50
Busy Hour Calls (Maximum, non-call center)	10,000
Locations	50

For a complete list of capacities, see *System Capacities Table for the Avaya Communication Manager on Avaya Media Servers*, 555-233-605.

Appendix B: Supported Avaya products

This appendix lists the Avaya telephones supported by the G350.

Avaya IP telephones

The G350 supports the following Avaya IP telephones:

- Avaya 4602 IP Telephone
- Avaya 4602SW IP Telephone
- Avaya 4601 IP Telephone
- Avaya 4606 IP Telephone
- Avaya 4610 IP Telephone
- Avaya 4612 IP Telephone
- Avaya 4620 IP Telephone
- Avaya 4624 IP Telephone
- Avaya 4630 IP Screenphone
- Avaya 4630SW IP Screenphone
- Avaya 4690 IP Telephone

Note:

The Avaya 4630 IP and 4630SW IP Screenphones cannot be powered via PoE ports.

Avaya DCP digital telephones

The DCP media modules supported by the G350 support the following DCP telephones:

- Avaya 2402 Digital Telephone
- Avaya 2420 Digital Telephone
- Avaya 6402 and Avaya 6402D Digital Telephones
- Avaya 6408 and Avaya 6408D+ Digital Telephones
- Avaya 6416 and 6416D+M Digital Telephone
- Avaya 6424 and 6424D+M Digital Telephone
- Avaya 8410D Digital Telephone
- Avaya 8434DX Digital Telephone

Supported Avaya products

- Definity Extender – Analog single endpoint
- Definity Extender – ISDN single endpoint302 series Attendant Console (302D)
- Avaya 603E Call Master III
- Avaya 603F Call Master IV
- Avaya 607A Call Master V
- Avaya 606B1 Call Master VI
- Avaya eConsole R1 (PC Console R3 with 8411 digital telephone)
- Avaya IP eConsole

Avaya analog telephones

The G350 supports the following Avaya analog telephones:

- Avaya 6211 Analog Telephone
- Avaya 6219 Analog Telephone
- Avaya 2500 and The Avaya 2554 Analog Terminals
- 2520 Explosive Atmosphere Telephone

Appendix C: Technical specifications

G350 specifications

The table of technical specifications provides detailed information on the physical dimensions and tolerances of the G350 Media Gateway:

Table 11: Avaya G350 Media Gateway specifications

Description	Value
Height	133.3 mm
Width	482.6 mm
Depth	400 mm
Weight of empty chassis	9-10 kg
Ambient working temperature	0-40°C
Operation altitude	up to 2000 m
Front Clearance	30 cm, 12 in
Rear Clearance	45 cm, 18 in
Humidity	20-60% relative humidity
Power rating	100-240 V~, 7 A Max, 50-60 Hz.

Media module specifications

The following table shows the specifications of the media modules supported by the G350:

Table 12: Media modules

Description	Value
MM312 and MM314 media modules	
Height	4.4 cm
Width	39 cm
Depth	31 cm
Weight	3-4 kg
Other media modules	
Height	2 cm
Width	17 cm
Depth	31 cm
Weight	300-400 grams

Index

Numerical

802.1x protocol [15](#)

A

Administration of the Avaya G350 Media Gateway . . . [45](#)
 Applications of G350 [15](#)
 ASB button [17](#)
 Avaya Communication Manager [33](#)
 Avaya Enterprise Connect [13](#)
 Avaya G350 Manager
 documentation [45](#)
 Avaya G350 Manager documentation [45](#)
 Avaya G350 Manager User Guide [45](#)
 Avaya G350 Media Gateway CLI Reference [45](#)
 Avaya G350 Media Gateway Glossary [45](#)
 Avaya Softphone software [31](#)

B

Buttons
 ASB [17](#)
 RST [17](#)

C

Call center features [34](#)
 Calls, preserving [32](#)
 CCA port [17](#)
 Chapter
 documentation [45](#)
 Introduction [13](#)
 Summary of services [29](#)
 Chassis, front panel [16](#)
 CLI
 documentation [45](#)
 CLI documentation [45](#)
 Computer, as a telephone [31](#)
 Configuration possibilities [15](#)
 CONSOLE port [17](#)
 Contact Closure [34](#)
 Continuous telephone services [32](#)

D

Deployment modes [15](#)
 DHCP
 relay [15](#)
 server [15](#)
 Distributed Avaya Enterprise Connect working mode . . [16](#)
 Documentation
 Administration of the Avaya G350 Media Gateway . [45](#)
 Avaya G350 Manager User Guide [45](#)
 Avaya G350 Media Gateway CLI Reference [45](#)
 Avaya G350 Media Gateway Glossary [45](#)
 chapter [45](#)
 Installation and Upgrades for the Avaya G350
 Media Gateway [45](#)
 Maintenance of the Avaya G350 Media Gateway . . [45](#)
 Quick Start for Hardware Installation for the Avaya
 G350 Media Gateway [45](#)
 Dry contacts [34](#)
 Dynamic trap manager [32](#)

E

EAP [15](#)
 EAPOL [15](#)
 ECC (External Call Controller). [31](#)
 Emergency Transfer Relay [34](#)
 ETH LAN port [17](#)
 ETH WAN port [14, 17](#)
 ETR (Emergency Transfer Relay) [34](#)

F

Features of the G350 [13](#)
 Federal Information Processing Standard [14](#)
 FIPS [14](#)
 Fixed LAN port [35](#)
 Fixed ports
 CCA [17](#)
 CONSOLE [17](#)
 ETH LAN [17](#)
 ETH WAN [14, 17](#)
 LINE 2 [17](#)
 LINE1 [17](#)
 TRUNK [17](#)
 USB [17](#)

Index

Front panel

buttons, description	17
buttons, location	16
description	16
fixed ports, description	17
fixed ports, location	16
media module slots	16

G

G350

applications	15
features	13
front panel	16
introduction.	13
physical description	16

I

ICC (Internal Call Controller)	31
IEEE 802.1D	36
IEEE 802.1w	36
Installation and Upgrades for the Avaya G350 Media Gateway	45
Introduction chapter	13
IP phones	14

L

LAN authentication.	15
LAN ports	
fixed	35
switched	35
LAN services	
overview	35
physical media	35
PoE (Power over Ethernet)	35
port mirroring	36
port redundancy	36
STP (Spanning Tree Protocol)	36
VLANs configuration	36
LINE 1 port	17
LINE 2 port	17
Local Survivable Processor (LSP).	32

M

Maintenance of the Avaya G350 Media Gateway	45
Manuals	
Administration of the Avaya G350 Media Gateway.	45
Avaya G350 Manager User Guide	45
Avaya G350 Media Gateway CLI Reference	45
Avaya G350 Media Gateway Glossary	45
Installation and Upgrades for the Avaya G350 Media Gateway	45
Maintenance of the Avaya G350 Media Gateway	45
Quick Start for Hardware Installation for the Avaya G350 Media Gateway	45
Media Gateway Controller.	31
Media Gateway Services	
Voice over IP (VoIP).	15, 44
Media Gateway services	
MGC (Media Gateway Controller)	31
overview	29
physical media	30
voice related features	34
VoIP (Voice over IP).	30
Media modules, slot positions	16
MGC (Media Gateway Controller)	
media server management.	33
overview	31
supported media servers.	32

N

New features.	14
-----------------------	--------------------

P

Physical description	16
PoE (Power over Ethernet)	
overview	35
traps	15
Port mirroring	36
Port redundancy	36
Ports	
CCA	17
CONSOLE	17
ETH LAN	17
ETH WAN	14, 17
fixed front panel, description	17
for telephone lines.	31
for telephones.	30
front panel fixed	16
LAN	35
LINE 1	17
LINE 2	17
TRUNK	17
USB	17

Power over Ethernet	35
PPPoE	14
Product introduction	13

Q

QoS management	15
Quick Start for Hardware Installation for the Avaya G350 Media Gateway.	45

R

RADIUS.	15
Release 2.2	14
Routing features	40
RST button	17
RSTP (Rapid Spanning Tree Protocol)	36
RTP statistics	15
RTP-MIB	44

S

Services	
LAN	35
Media Gateway.	29
summary	29
telephone	29
Slots, positions	16
SNMP.	15, 44
Softphone software	31
Standalone working mode	16
STP (Spanning Tree Protocol)	36
Summary of services chapter	29
Survivability	32
Switched LAN ports	35

T

Telephones	
outside lines	31
ports for different types	30
services	29
supported	30
TFTP	14
Topologies	15
Trivial File Transfer Protocol	14
TRUNK port	17

U

USB port.	17
-------------------	--------------------

V

Virtual Private Network	14
VLAN features	36
Voice over IP (VoIP) services	15, 30, 44
Voice software	31
VPN	14

W

WAN features	38
WAN lines	
matching media modules	37
supported.	37
WAN services	
overview	37
physical media	37
routing features	40
What's New in Release 2.2	14
Working mode	
distributed Avaya Enterprise Connect.	16
standalone	16

