MOTOROLA

Administrator's Handbook

Motorola® Embedded Software Version 9.0.6

Motorola® NVG510 Voice Gateway

at&t

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Table of Contents

CHAPTER 1 Introduction

About Motorola® Documentation

NOTE:

This guide describes the wide variety of features and functionality of the Motorola® Gateway, when used in Router mode. The Motorola® Gateway may also be delivered in Bridge mode. In Bridge mode, the Gateway acts as a pass-through device and allows the workstations on your LAN to have public addresses directly on the Internet.

Motorola, Inc. provides a suite of technical information for its family of intelligent enterprise and consumer Gateways. It consists of:

- Administrator’s Handbook
- Dedicated User Manuals
- Specific White Papers

The documents are available in electronic form as Portable Document Format (PDF) files. They are viewed (and printed) from Adobe Acrobat Reader, Exchange, or any other application that supports PDF files.

They are downloadable from the Motorola’s website:
http://www.motorola.com/support

Documentation Conventions

General

This manual uses the following conventions to present information:

Convention (Typeface)	Description
bold italic monospaced	Menu commands
bold sans serif	Web GUI page links and button names
`terminal`	Computer display text
`bold terminal`	User-entered text
Italic	Italic type indicates the complete titles of manuals.

Internal Web Interface

Convention (Graphics)	Description
blue rectangle or line	Denotes an "excerpt" from a Web page or the visual truncation of a Web page
solid rounded rectangle with an arrow	Denotes an area of emphasis on a Web page

Command Line Interface

Syntax conventions for the Motorola Gateway command line interface are as follows:

Convention	Description
straight ([ ]) brackets in cmd line	Optional command arguments
curly ({ }) brackets, with values separated with vertical bars (|).	Alternative values for an argument are presented in curly ({ }) brackets, with values separated with vertical bars (|).
`bold terminal type face`	User-entered text
`italic terminal type face`	Variables for which you supply your own values

Organization

This guide consists of five chapters, an appendix, and an index. It is organized as follows:

- **Chapter 1, Introduction** — Describes the Motorola® document suite, the purpose of, the audience for, and structure of this guide. It gives a table of conventions.
- **Chapter 2, "Device Configuration"** — Describes how to get up and running with your Motorola® Gateway.
- **Chapter 3, "Basic Troubleshooting"** — Gives some simple suggestions for troubleshooting problems with your Gateway's initial configuration.
- **Chapter 4, "Command Line Interface"** — Describes all the current text-based commands for both the SHELL and CONFIG modes. A summary table and individual command examples for each mode is provided.
- **Chapter 5, "Technical Specifications and Safety Information"**
- **"Appendix A Motorola® Gateway Captive Portal Implementation"** — Describes the Motorola® Gateway Captive Portal Implementation
- **Index**

A Word About Example Screens

This manual contains many example screen illustrations. Since Motorola® Gateways offer a wide variety of features and functionality, the example screens shown may not appear exactly the same for your particular Gateway or setup as they appear in this manual. The example screens are for illustrative and explanatory purposes, and should not be construed to represent your own unique environment.

CHAPTER 2 Device Configuration

Most users will find that the basic Quick Start configuration is all that they ever need to use. The Quick Start section may be all that you ever need to configure and use your Motorola® Gateway. For more advanced users, a rich feature set is available. The following instructions cover installation in Router Mode.

This chapter covers:

Important Safety Instructions

POWER SUPPLY INSTALLATION

Connect the power supply cord to the power jack on the Motorola® Gateway. Plug the power supply into an appropriate electrical outlet. There is no power (on / off) switch to power off the device.

WARNING:

The power supply must be connected to a mains outlet with a protective earth connection. Do not defeat the protective earth connection.

CAUTION:
Depending on the power supply provided with the product, either the direct plug-in power supply blades, power supply cord plug or the appliance coupler serves as the mains power disconnect. It is important that the direct plug-in power supply, socket-outlet or appliance coupler be located so it is readily accessible.
(Sweden) Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk
(Norway) Apparatet må kun tilkoples jordet stikkontakt.

TELECOMMUNICATION INSTALLATION

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

- Do not use this product near water, for example, near a bathtub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.
- CAUTION: The external phone should be UL Listed and the connections should be made in accordance with Article 800 of the NEC.

PRODUCT VENTILATION

The Motorola® Gateway is intended for use in a consumer's home. Ambient temperatures around this product should not exceed 104°F (40°C). It should not be used in locations exposed to outside heat radiation or trapping of its own heat. The product should have at least one inch of clearance on all sides except the bottom when properly installed and should not be placed inside tightly enclosed spaces unless proper ventilation is provided.

SAVE THESE INSTRUCTIONS

NETZTEIL INSTALLIEREN

Verbinden Sie das Kabel vom Netzteil mit dem Power-Anschluss an dem Motorola® Gateway. Stecken Sie dann das Netzteil in eine Netzsteckdose.

☛ **Warnung:**

Das Netzteil muss an eine Steckdose, die mit einem Schutzleiter verbunden ist, angeschlossen werden. Die Schutzleiterverbindung darf in keinem Fall unterbrochen werden.

Achtung:
Abhängig von dem mit dem Produkt gelieferten Netzteil, entweder die direkten Steckernetzgeräte, Stecker vom Netzkabel oder der Gerätekoppler dienen als Hauptspannungsunterbrechung. Es ist wichtig, dass das Steckernetzgerät, Steckdose oder Gerätekoppler frei zugänglich sind.
(Sweden) Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk
(Norway) Apparatet må kun tilkoples jordet stikkontakt.

INSTALLATION DER TELEKOMMUNIKATION

Wenn Ihre Telefonausrüstung verwendet wird, sollten grundlegende Sicherheitsanweisungen immer befolgt werden, um die Gefahr eines Feuers, eines elektrischen Schlages und die Verletzung von Personen, zu verringern. Beachten Sie diese weiteren Hinweise:

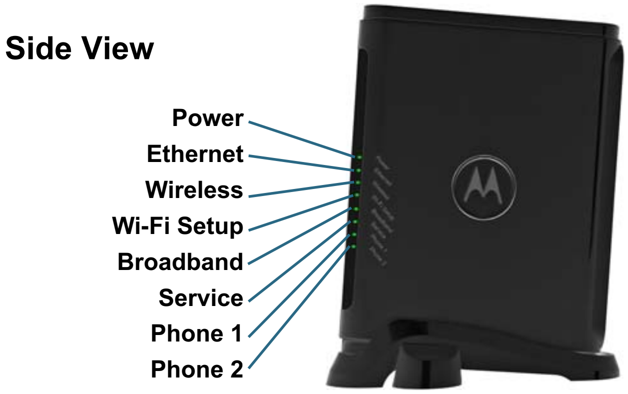
- Benutzen Sie dieses Produkt nicht in Wassernähe wie z.B. nahe einer Badewanne, Waschschüssel, Küchenspüle, in einem nassen Keller oder an einem Swimmingpool.
- Vermeiden Sie das Telefonieren (gilt nicht für schnurlose Telefone) während eines Gewitters. Es besteht die Gefahr eines elektrischen Schlages durch einen Blitz.
- Nicht das Telefon benutzen um eine Gasleckstelle zu Melden, wenn Sie sich in der Nähe der Leckstelle befinden.

Bewahren Sie diese Anweisungen auf

Motorola® Gateway Status Indicator Lights

Colored LEDs on your Motorola® Gateway indicate the status of various port activity.

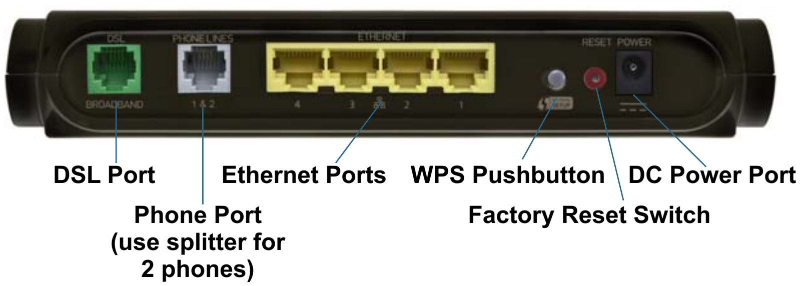
Motorola® Gateway NVG510 status indicator lights



LED	Action
Power	Solid Green = The device is powered. Flashing Green = A Power-On Self-Test (POST) is in progress Flashing Red = A POST failure (not bootable) or device malfunction occurred. * When the device encounters a POST failure, all indicator lights on the front of the device continuously flash. Off = The unit has no AC power.
Ethernet	Solid Green = Powered device connected to the associated port (includes devices with wake-on-LAN capability where a slight voltage is supplied to the Ethernet connection). Flickering Green = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic. Off = The device is not powered, no cable or no powered devices connected to the associated ports.
Wireless	Solid Green = WIFI is powered. Flickering Green = Activity seen from devices connected via WIFI. The flickering of the light is synchronized to actual data traffic. Off = The device is not powered or no powered devices connected to the associated ports.
Wi-Fi Setup	Flickering Green = Indicates when WPS is broadcasting. Off = not in use, not broadcasting.
Broadband	Solid Green = Good broadband connection (i.e., good DSL Sync). Flashing Green = Attempting broadband connection (i.e., DSL attempting sync). Flashing Green & Red = If the broadband connection fails to be established for more than three consecutive minutes the LED switches to Flashing Green when attempting or waiting to establish a broadband connection alternating with a five second steady Red. This pattern continues until the broadband connection is successfully established. Flashing Red = No DSL signal on the line. This is only used when there is no signal, not during times of temporary 'no tone' during the training sequence. Off = The device is not powered.

LED	Action
Service	Solid Green = IP connected (The device has a WAN IP address from DHCP or 802.1x authentication and the broadband connection is up). Flashing Green = Attempting PPP connection. Attempting IEEE 802.1X authentication or attempting to obtain DHCP information. Red = Device attempted to become IP connected and failed (no DHCP response, no PPPoE response, 802.1x authentication failed, no IP address from IPCP, etc.). The Red state times out after two minutes and the Service indicator light returns to the Off state. Off = The device is not powered or the broadband connection is not present.
Phone 1, 2	Solid Green = The associated VoIP line has been registered with a SIP proxy server. Flashing Green = Indicates a telephone is off-hook on the associated VoIP line. Off = VoIP not in use, line not registered or Gateway power off.

Motorola® Gateway NVG510 Rear View



Set up the Motorola Gateway

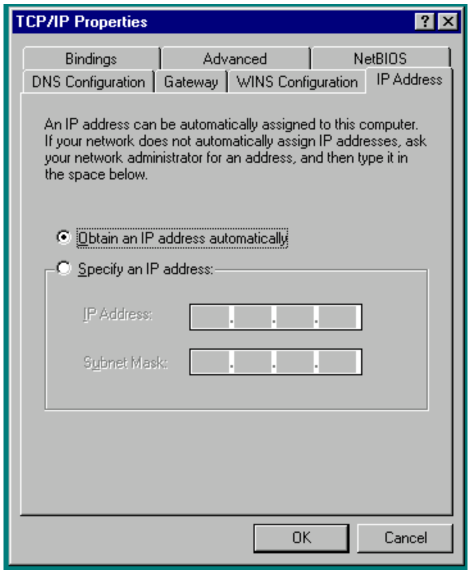
Refer to your Quickstart Guide for instructions on how to connect your Motorola® gateway to your power source, PC or local area network, and your Internet access point, whether it is a dedicated DSL outlet or a DSL or cable modem. Different Motorola® Gateway models are supplied for any of these connections. Be sure to enable Dynamic Addressing on your PC. Perform the following:

Microsoft Windows:

Step 1. Navigate to the TCP/IP Properties Control Panel.

a. Some Windows versions follow a path like this:

Start menu -> ***Settings*** -> **Control Panel** -> **Network** (or **Network and Dial-up Connections** -> **Local Area Connection** -> **Properties**) -> **TCP/IP [your_network_card]** or **Internet Protocol [TCP/IP]** -> **Properties**



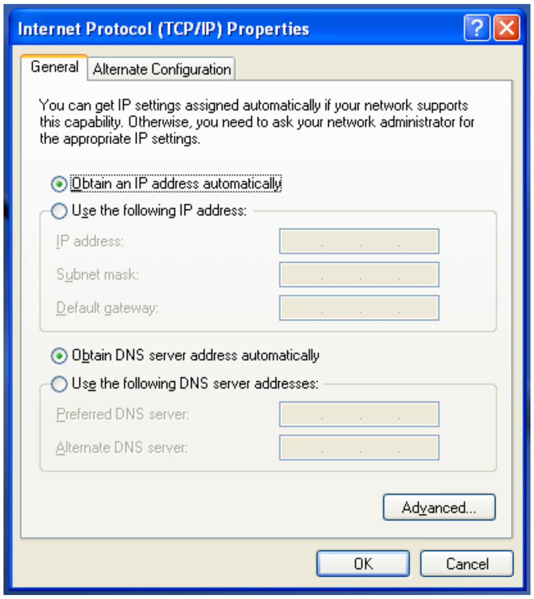
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.

● Obtain an IP address automatically

○ Specify an IP address:

b. Some Windows versions follow a path like this:

Start menu -> **Control Panel** -> **Network and Internet Connections** -> **Network Connections** -> **Local Area Connection** -> **Properties** -> **Internet Protocol [TCP/IP]** -> **Properties**



You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

Then go to Step 2.

Step 2. Select Obtain an IP address automatically.

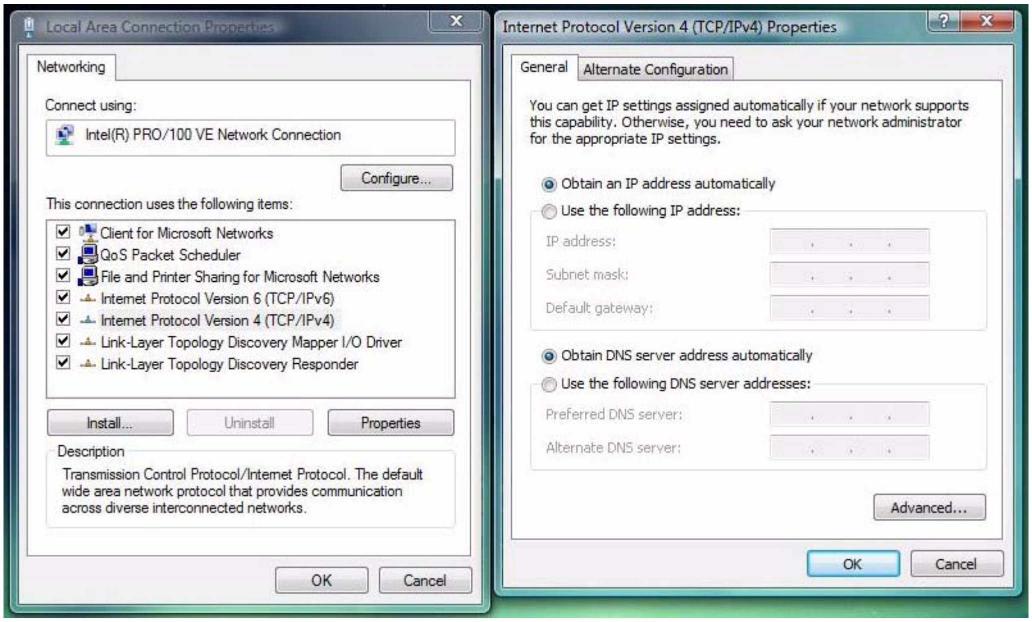
Step 3. Select Obtain DNS server address automatically, if available.

Step 4. Remove any previously configured Gateways, if available.

Step 5. OK the settings. Restart if prompted.

c. Windows Vista and Windows 7 obtain an IP address automatically by default. You may not need to configure it at all.

To check, open the **Networking** Control Panel and select **Internet Protocol Version 4 (TCP/IPv4)**. Click the **Properties** button.



Local Area Connection Properties

Networking

Connect using:

Intel(R) PRO/100 VE Network Connection

This connection uses the following items:

☑ Client for Microsoft Networks
☑ QoS Packet Scheduler
☑ File and Printer Sharing for Microsoft Networks
☑ Internet Protocol Version 6 (TCP/IPv6)
☑ Internet Protocol Version 4 (TCP/IPv4)
☑ Link-Layer Topology Discovery Mapper I/O Driver
☑ Link-Layer Topology Discovery Responder

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically
○ Use the following IP address:

IP address:
Subnet mask:
Default gateway:

● Obtain DNS server address automatically
○ Use the following DNS server addresses:

Preferred DNS server:
Alternate DNS server:

The **Internet Protocol Version 4 (TCP/IPv4) Properties** window should appear as shown.

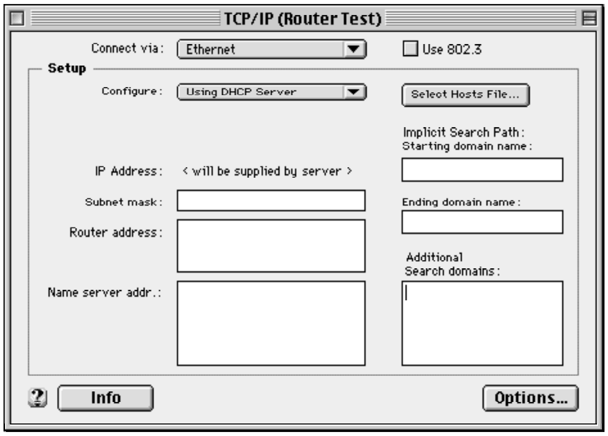
If not, select the radio buttons shown above, and click the **OK** button.

Macintosh MacOS 8 or higher or Mac OS X:

Step 1. Access the TCP/IP or Network control panel.

a. MacOS follows a path like this:

Apple Menu -> **Control Panels** -> **TCP/IP** Control Panel



TCP/IP (Router Test)

Connect via: Ethernet

□ Use 802.3

Setup

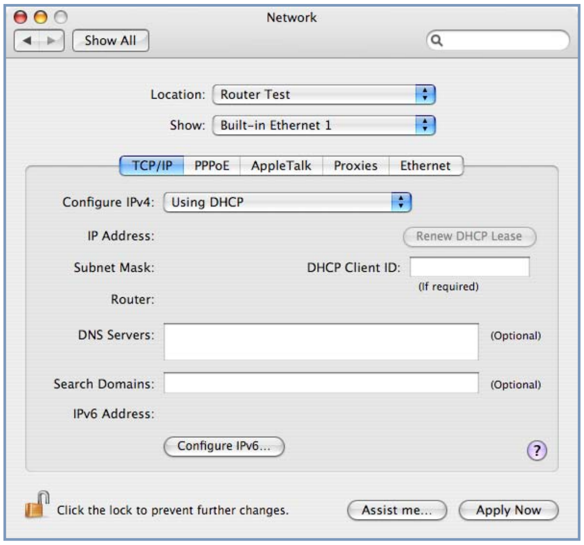
Configure: Using DHCP Server

IP Address: < will be supplied by server >

b. Mac OS X follows a path like this:

Apple Menu -> **System Preferences** -> **Network**

Then go to Step 2.



Network

Location: Router Test

Show: Built-in Ethernet 1

Configure IPv4: Using DHCP

Click the lock to prevent further changes.

Step 2. Select Built-in Ethernet

Step 3. Select Configure Using DHCP

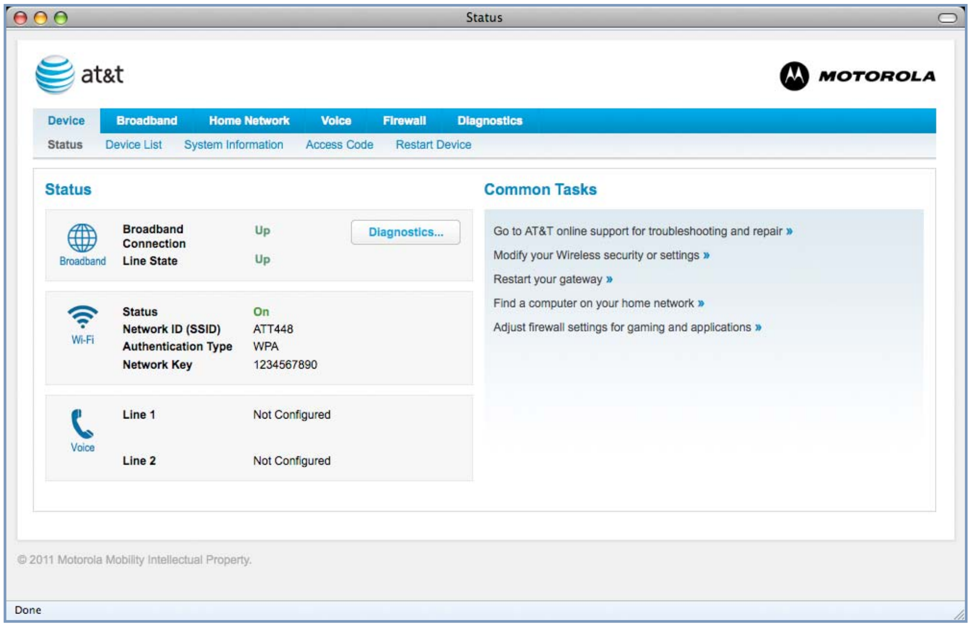
Step 4. Close and Save, if prompted.

Proceed to "Accessing the Web Management Interface" on page 19.

Accessing the Web Management Interface

1. **Run your Web browser application, such as Firefox or Microsoft Internet Explorer, from the computer connected to the Motorola® Gateway.**
2. **Enter http://192.168.1.254 in the Location text box.**

   The Device Status Page appears.



Status

Broadband	Broadband Connection	Up
	Line State	Up
Wi-Fi	Status	On
	Network ID (SSID)	ATT448
	Authentication Type	WPA
	Network Key	1234567890
Voice	Line 1	Not Configured
	Line 2	Not Configured

Common Tasks

Go to AT&T online support for troubleshooting and repair »

Modify your Wireless security or settings »

Restart your gateway »

Find a computer on your home network »

Adjust firewall settings for gaming and applications »

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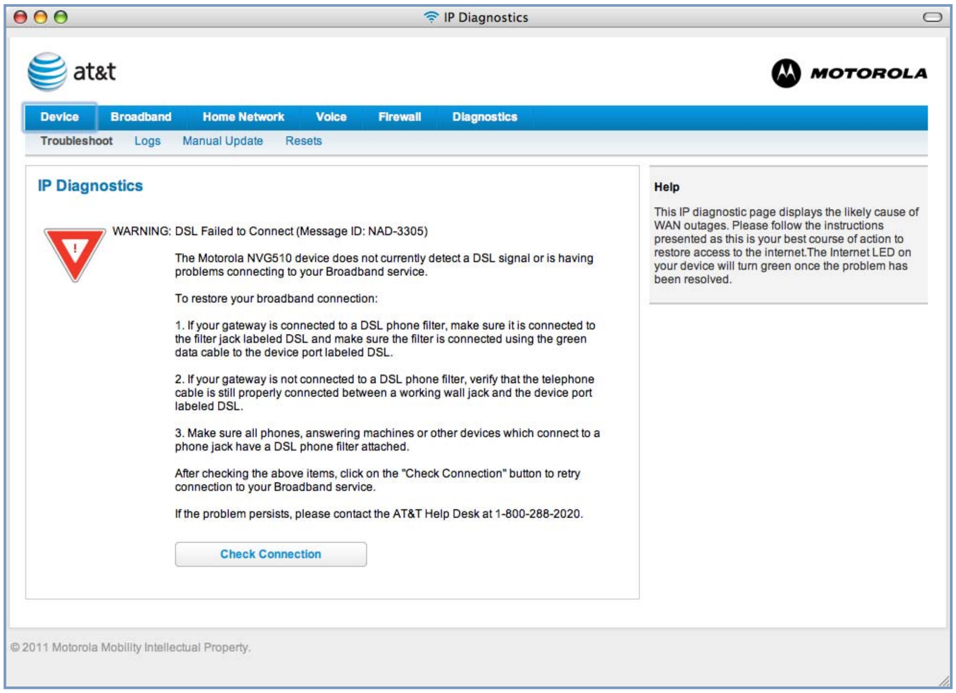
3. **Check to make sure the Broadband and Service LEDs are lit GREEN to verify that the connection to the Internet is active.**

Congratulations! Your installation is complete.

You can now surf to your favorite Web sites by typing an URL in your browser's location box or by selecting one of your favorite Internet bookmarks.

IP Diagnostics page

In the event that your connection to the Internet fails, the **IP Diagnostics** page displays.



IP Diagnostics

WARNING: DSL Failed to Connect (Message ID: NAD-3305)

The Motorola NVG510 device does not currently detect a DSL signal or is having problems connecting to your Broadband service.

To restore your broadband connection:

1. If your gateway is connected to a DSL phone filter, make sure it is connected to the filter jack labeled DSL and make sure the filter is connected using the green data cable to the device port labeled DSL.

2. If your gateway is not connected to a DSL phone filter, verify that the telephone cable is still properly connected between a working wall jack and the device port labeled DSL.

3. Make sure all phones, answering machines or other devices which connect to a phone jack have a DSL phone filter attached.

After checking the above items, click on the "Check Connection" button to retry connection to your Broadband service.

If the problem persists, please contact the AT&T Help Desk at 1-800-288-2020.

Check Connection

Help

This IP diagnostic page displays the likely cause of WAN outages. Please follow the instructions presented as this is your best course of action to restore access to the internet.The Internet LED on your device will turn green once the problem has been resolved.

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Follow the on-screen troubleshooting suggestions.

For additional troubleshooting information, see "Basic Troubleshooting" on page 69.

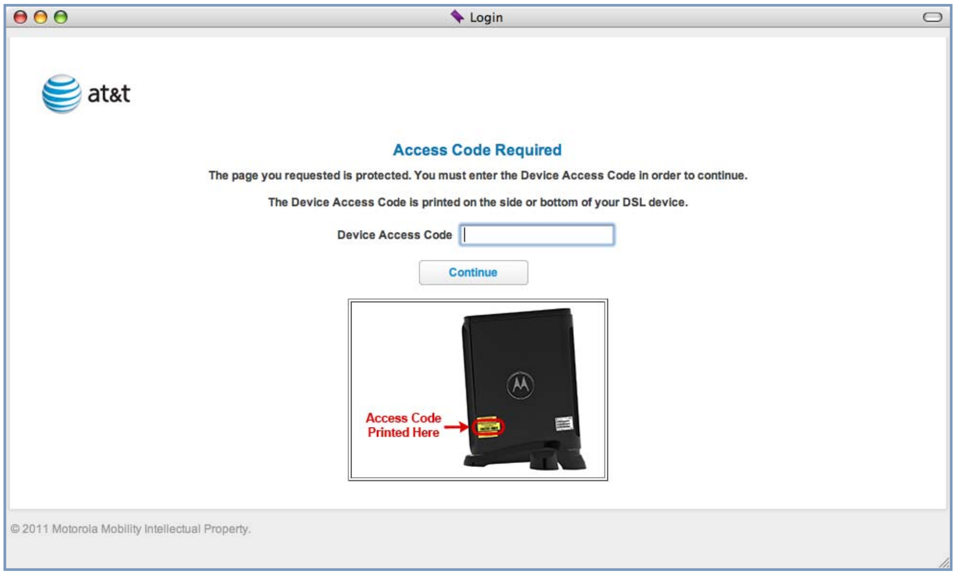
Device Status page

After you have performed the basic Easy Login configuration, any time you log in to your Motorola® Gateway you will access the Motorola® Gateway Home Page.

You access the Home Page by typing **http://192.168.1.254** in your Web browser's location box.

Device Access Code

You may be required to provide your Device Access Code in order to access the web management configuration pages. The **Device Access Code** is unique to your device. It is printed on a label on the side of the Gateway.



Access Code Required

The page you requested is protected. You must enter the Device Access Code in order to continue.

The Device Access Code is printed on the side or bottom of your DSL device.

Device Access Code

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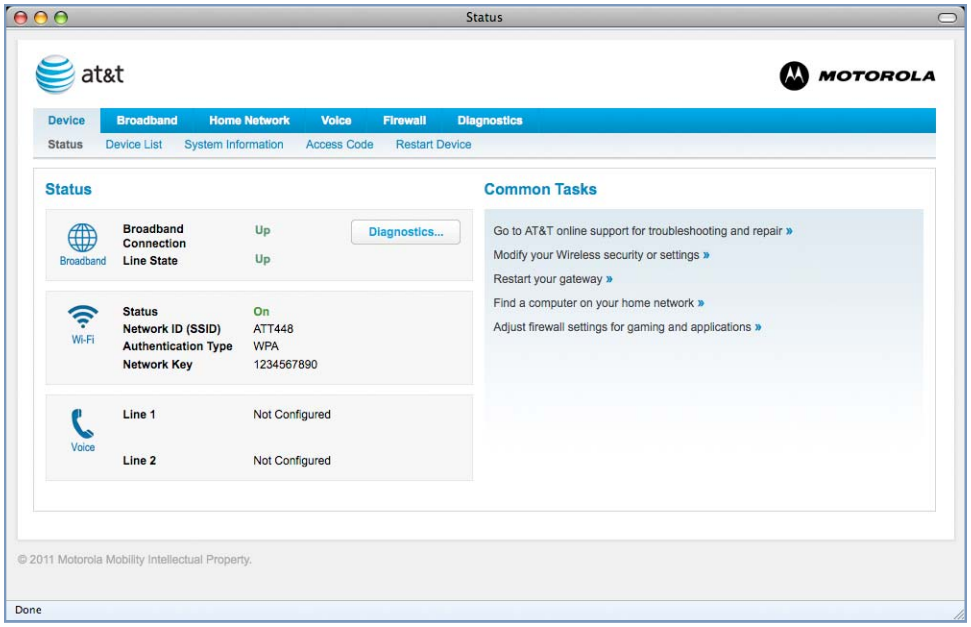
Enter your **Device Access Code** and click the **Continue** button.

The Device Status Page appears.



Status

Broadband Connection	Up
Line State	Up
Status	On
Network ID (SSID)	ATT448
Authentication Type	WPA
Network Key	1234567890
Line 1	Not Configured
Line 2	Not Configured

Common Tasks

Go to AT&T online support for troubleshooting and repair »

Modify your Wireless security or settings »

Restart your gateway »

Find a computer on your home network »

Adjust firewall settings for gaming and applications »

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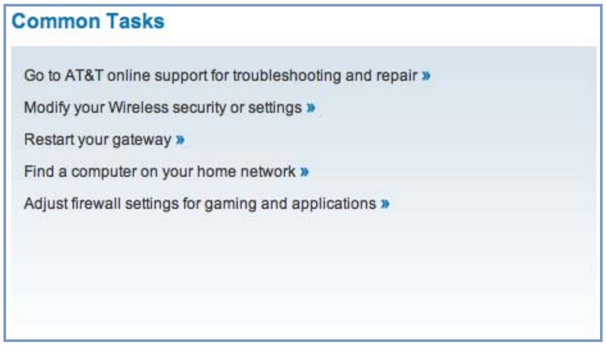
Done

The Device Status displays the following information in the center section:

Field	Description
Broadband	
Broadband Connection	'Waiting for DSL' is displayed while the Gateway is training. This should change to 'Up' within two minutes. 'Up' is displayed when the ADSL line is synched and the PPPoE session is established. 'Down' indicates inability to establish a connection; possible line failure.
Line State	Line State connection (Internet) is either Up or Down
Wi-Fi	
Status	Your wireless signal may be 'On' or 'Off'.
Network ID (SSID)	This is the name or ID that is displayed to a client scan. The default SSID for the Gateway is **attxxx** where **xxx** is the last 3 digits of the serial number located on the side of the Gateway.
Authentication Type	The type of wireless encryption security in use. May be **Disabled**, **WPA** or **WEP**, **Default Key** or **Manual**.
Network Key	Wireless network encryption key in use.
Voice	
Line 1	Indication of VoIP or other phone connection.
Line 2	Indication of VoIP or other phone connection.

Some fields may or may not display, depending on your particular setup.

The **Diagnostics** button will connect you to the **Troubleshoot** page. See "Diagnostics" on page 61.



Common Tasks

Go to AT&T online support for troubleshooting and repair »

Modify your Wireless security or settings »

Restart your gateway »

Find a computer on your home network »

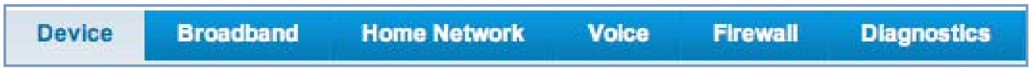
Adjust firewall settings for gaming and applications »

The right-hand frame displays some links to commonly performed tasks for easy access.

- **Go to AT&T online support for troubleshooting and repair »**
  This link will connect you to the **IP Diagnostics** page with help for troubleshooting and the AT&T Help Desk information. See "IP Diagnostics page" on page 20.
- **Modify your Wireless security or settings »**
  This link will connect you to the **Wireless** page. See "Wireless" on page 35.
- **Restart your gateway »**
  This link will connect you to the **Restart Device** page. See "Restart Device" on page 27.
- **Find a computer on your home network »**
  This link will connect you to the **Device List** page. See "Device List" on page 24.
- **Adjust firewall settings for gaming and applications »**
  This link will connect you to the **NAT/Gaming** page. See "NAT/Gaming" on page 53.

Tab Bar

The tab bar is located at the top of every page, allowing you to move freely about the site.

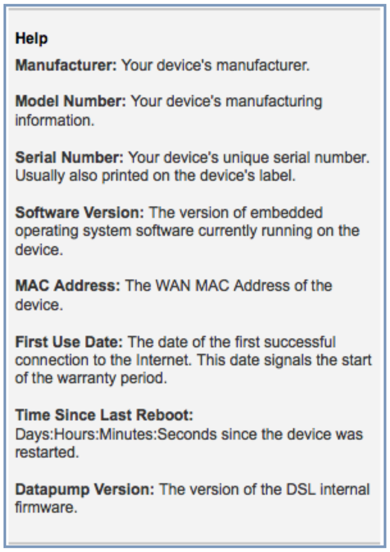


The tabs reveal a succession of pages that allow you to manage or configure several features of your Gateway. Each tab is described in its own section.

Help

Help is provided in your Gateway. Help is available in the right hand frame on every page in the Web interface.

Here is an example:



Help

Manufacturer: Your device's manufacturer.

Model Number: Your device's manufacturing information.

Serial Number: Your device's unique serial number. Usually also printed on the device's label.

Software Version: The version of embedded operating system software currently running on the device.

MAC Address: The WAN MAC Address of the device.

First Use Date: The date of the first successful connection to the Internet. This date signals the start of the warranty period.

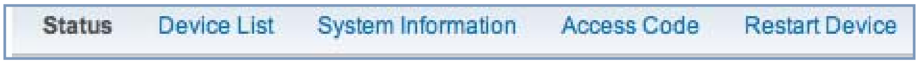
Time Since Last Reboot: Days:Hours:Minutes:Seconds since the device was restarted.

Datapump Version: The version of the DSL internal firmware.

The page shown here is displayed when you are on the **System Information** page.

Links Bar

The links bar at the top of each page allows you to configure different aspects of the features displayed on the page. For example, on the Home Summary page, the button bar is shown below:

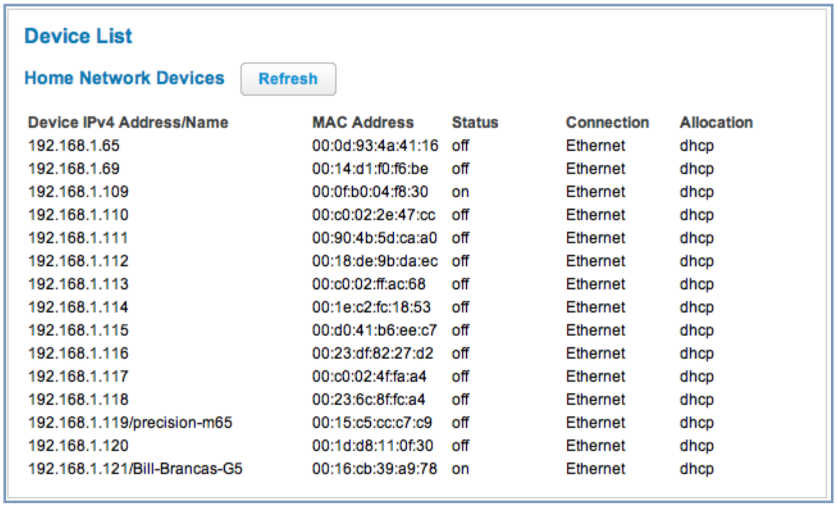


Click the links below to be taken to each section.

- “Device Status page” on page 21
- “Device List” on page 24
- “System Information” on page 25
- “Access Code” on page 26
- “Restart Device” on page 27

Link: Device List

When you click the **Device List** link, the **Device List** page appears.



Device List

Home Network Devices

Device IPv4 Address/Name	MAC Address	Status	Connection	Allocation
192.168.1.65	00:0d:93:4a:41:16	off	Ethernet	dhcp
192.168.1.69	00:14:d1:f0:f6:be	off	Ethernet	dhcp
192.168.1.109	00:0f:b0:04:f8:30	on	Ethernet	dhcp
192.168.1.110	00:c0:02:2e:47:cc	off	Ethernet	dhcp
192.168.1.111	00:90:4b:5d:ca:a0	off	Ethernet	dhcp
192.168.1.112	00:18:de:9b:da:ec	off	Ethernet	dhcp
192.168.1.113	00:c0:02:ff:ac:68	off	Ethernet	dhcp
192.168.1.114	00:1e:c2:fc:18:53	off	Ethernet	dhcp
192.168.1.115	00:d0:41:b6:ee:c7	off	Ethernet	dhcp
192.168.1.116	00:23:df:82:27:d2	off	Ethernet	dhcp
192.168.1.117	00:c0:02:4f:fa:a4	off	Ethernet	dhcp
192.168.1.118	00:23:6c:8f:fc:a4	off	Ethernet	dhcp
192.168.1.119/precision-m65	00:15:c5:cc:c7:c9	off	Ethernet	dhcp
192.168.1.120	00:1d:d8:11:0f:30	off	Ethernet	dhcp
192.168.1.121/Bill-Brancas-G5	00:16:cb:39:a9:78	on	Ethernet	dhcp

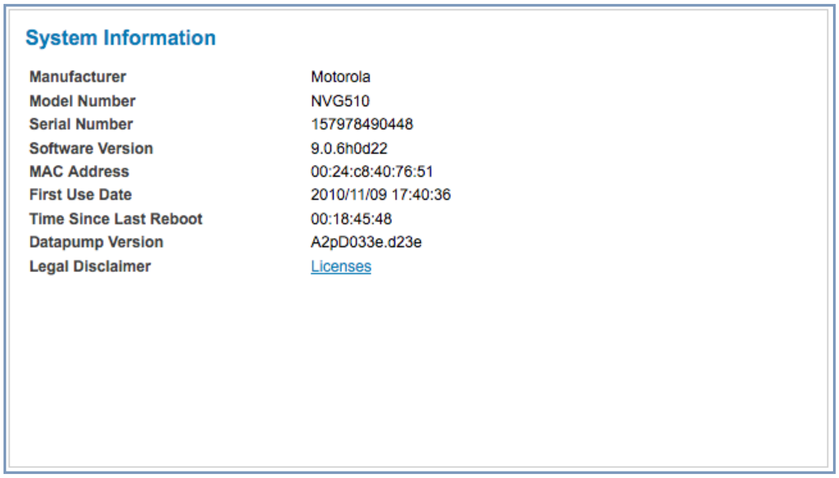
The page displays the following information:

Home Network Devices	
Home Network Devices	Displays the IP Address, Network Name, and MAC Address of devices connected to this Gateway on your local area network.
Device IPv4 Address	Client device’s IP address or device network name.
MAC Address	Client device’s unique hardware address.
Status	May be off or on.
Connection	Type of connection, for example, Ethernet.
Allocation	Type of IP address assignment, for example, Static or DHCP.

Click the **Refresh** button to update the Home Network summary.

Link: System Information

When you click the **System Information** link, the **System Information** page appears.



System Information

Manufacturer	Motorola
Model Number	NVG510
Serial Number	157978490448
Software Version	9.0.6h0d22
MAC Address	00:24:c8:40:76:51
First Use Date	2010/11/09 17:40:36
Time Since Last Reboot	00:18:45:48
Datapump Version	A2pD033e.d23e
Legal Disclaimer	Licenses

The page displays the following information:

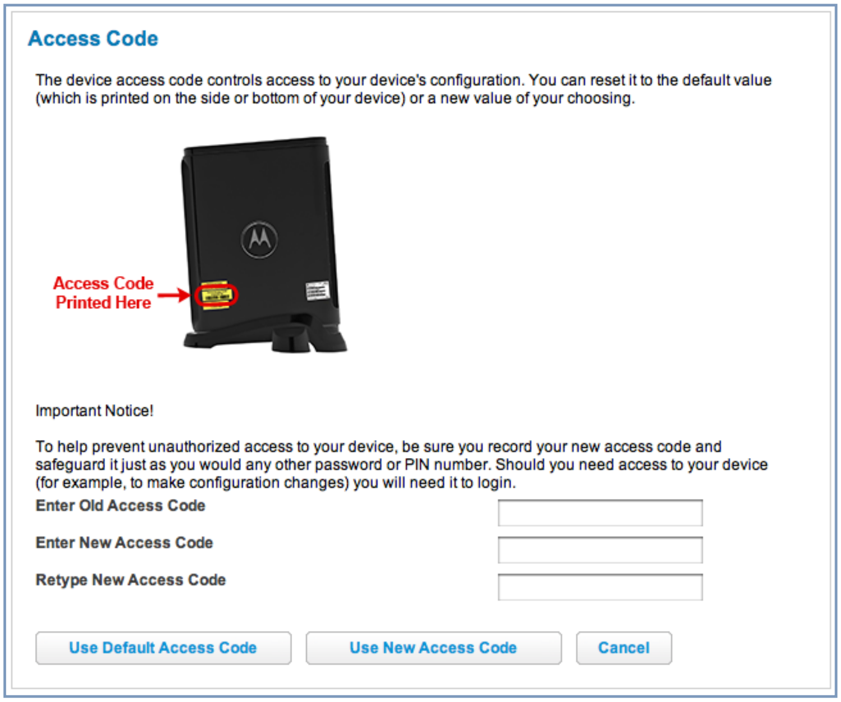
System Information	
Manufacturer	This is the manufacturer’s identifier name.
Model Number	This is the manufacturer’s model number.
Serial Number	This is the unique serial number of your Gateway.
Software Version	This is the version number of the current embedded software in your Gateway.
MAC Address	Unique hardware address of this Gateway unit.
First Use Date	Date and Time when the Gateway is first used. This field changes to the current date and time after a reset to factory defaults.
Time Since Last Reboot	Elapsed time since last reboot of the Gateway in days:hr:min:sec.
Datapump Version	Underlying operating system software datapump version
Legal Disclaimer	Clicking the **Licenses** link displays a listing of software copyright attributions.

Link: Access Code

Access to your Gateway is controlled through an account named **Admin**. The default Admin password for your Gateway is the unique Access Code printed on the label on the side of your Gateway.

As the Admin, you can change this password to a different one of your own choosing up to 32 characters long. The new password must also include two characters from any these categories: alpha, number, and special characters.

Example: "fru1tfl13s_likeabanana"



Access Code

The device access code controls access to your device's configuration. You can reset it to the default value (which is printed on the side or bottom of your device) or a new value of your choosing.

Important Notice!

To help prevent unauthorized access to your device, be sure you record your new access code and safeguard it just as you would any other password or PIN number. Should you need access to your device (for example, to make configuration changes) you will need it to login.

Enter Old Access Code

Enter New Access Code

Retype New Access Code

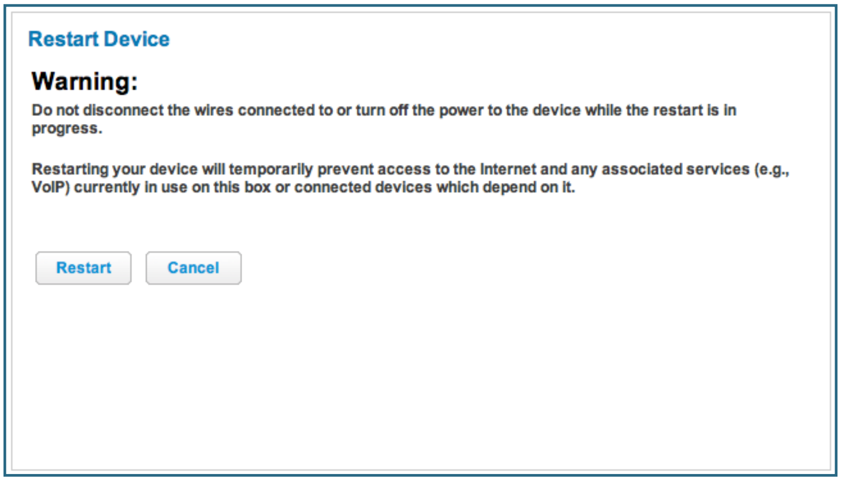
Enter your Old Access Code, your New Access Code, and click the **Use New Access Code** button. The new Access Code takes effect immediately.

You can always return to the original default password by clicking the **Use Default Access Code** button.

Link: Restart Device

When the Gateway is restarted, it will disconnect all users, initialize all its interfaces, and load the Operating System Software.

When you make configuration changes, you may be required restart for the changes to take effect.



Restart Device

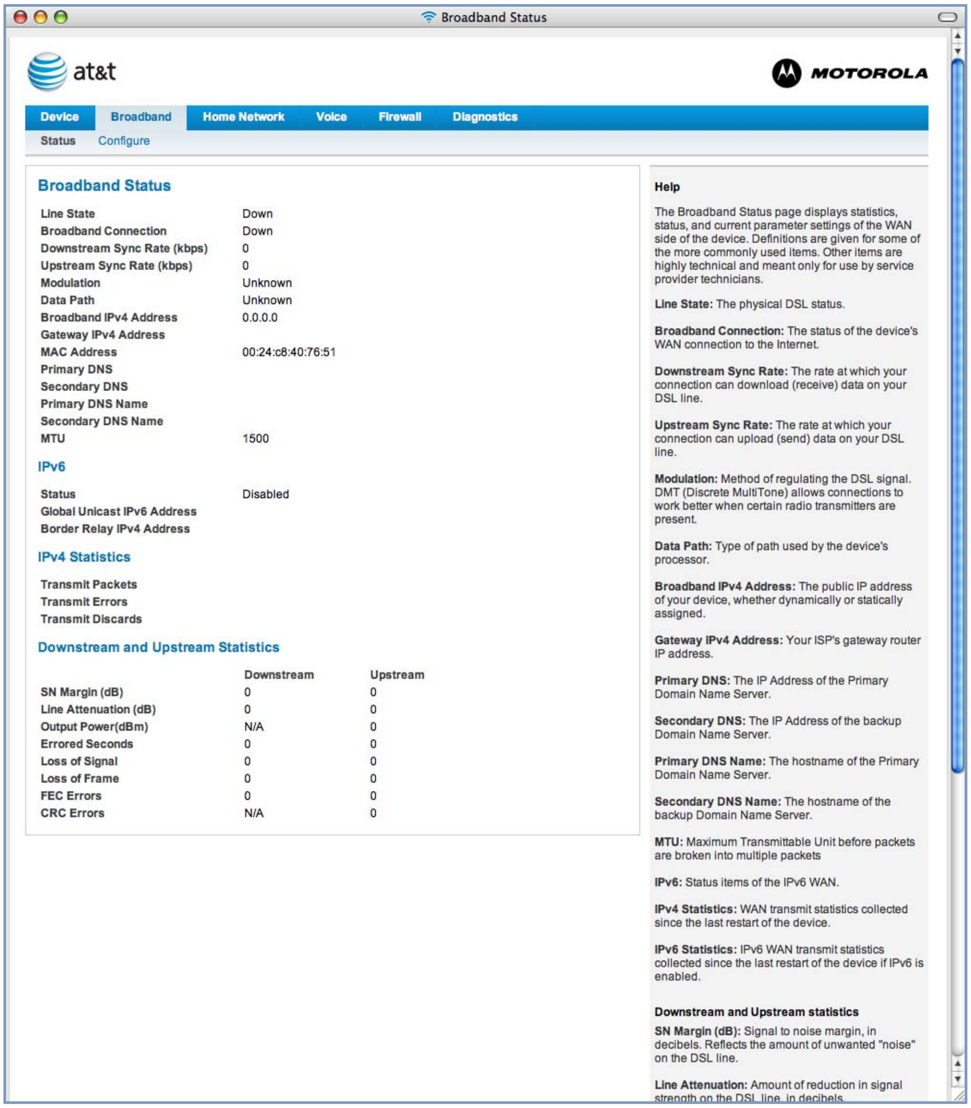
Warning:

Do not disconnect the wires connected to or turn off the power to the device while the restart is in progress.

Restarting your device will temporarily prevent access to the Internet and any associated services (e.g., VoIP) currently in use on this box or connected devices which depend on it.

Broadband

When you click the **Broadband** tab, the **Broadband Status** page appears.



Broadband Status

Line State	Down
Broadband Connection	Down
Downstream Sync Rate (kbps)	0
Upstream Sync Rate (kbps)	0
Modulation	Unknown
Data Path	Unknown
Broadband IPv4 Address	0.0.0.0
Gateway IPv4 Address	
MAC Address	00:24:c8:40:76:51
Primary DNS	
Secondary DNS	
Primary DNS Name	
Secondary DNS Name	
MTU	1500

IPv6

Status	Disabled
Global Unicast IPv6 Address	
Border Relay IPv4 Address	

IPv4 Statistics

Transmit Packets	
Transmit Errors	
Transmit Discards	

Downstream and Upstream Statistics

	Downstream	Upstream
SN Margin (dB)	0	0
Line Attenuation (dB)	0	0
Output Power(dBm)	N/A	0
Errored Seconds	0	0
Loss of Signal	0	0
Loss of Frame	0	0
FEC Errors	0	0
CRC Errors	N/A	0

Help

The Broadband Status page displays statistics, status, and current parameter settings of the WAN side of the device. Definitions are given for some of the more commonly used items. Other items are highly technical and meant only for use by service provider technicians.

Line State: The physical DSL status.

Broadband Connection: The status of the device's WAN connection to the Internet.

Downstream Sync Rate: The rate at which your connection can download (receive) data on your DSL line.

Upstream Sync Rate: The rate at which your connection can upload (send) data on your DSL line.

Modulation: Method of regulating the DSL signal. DMT (Discrete MultiTone) allows connections to work better when certain radio transmitters are present.

Data Path: Type of path used by the device's processor.

Broadband IPv4 Address: The public IP address of your device, whether dynamically or statically assigned.

Gateway IPv4 Address: Your ISP's gateway router IP address.

Primary DNS: The IP Address of the Primary Domain Name Server.

Secondary DNS: The IP Address of the backup Domain Name Server.

Primary DNS Name: The hostname of the Primary Domain Name Server.

Secondary DNS Name: The hostname of the backup Domain Name Server.

MTU: Maximum Transmittable Unit before packets are broken into multiple packets

IPv6: Status items of the IPv6 WAN.

IPv4 Statistics: WAN transmit statistics collected since the last restart of the device.

IPv6 Statistics: IPv6 WAN transmit statistics collected since the last restart of the device if IPv6 is enabled.

Downstream and Upstream statistics

SN Margin (dB): Signal to noise margin, in decibels. Reflects the amount of unwanted "noise" on the DSL line.

Line Attenuation: Amount of reduction in signal strength on the DSL line, in decibels.

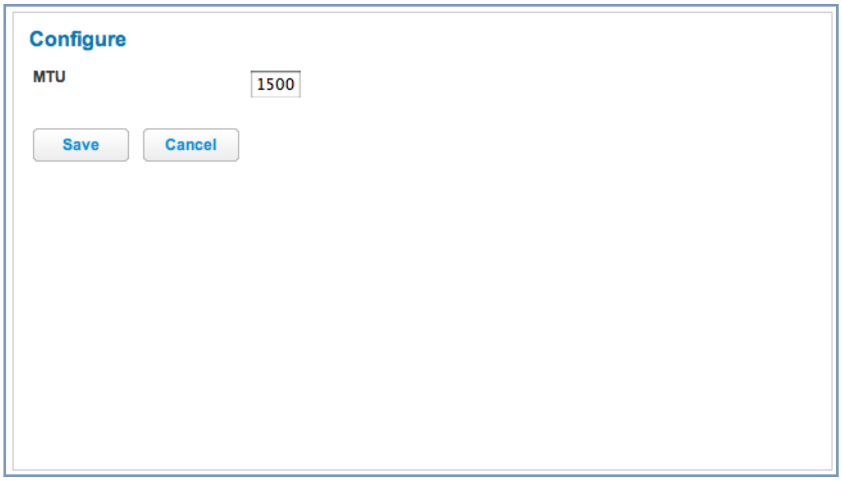
The **Broadband Status** page displays information about the Gateway's WAN connection to the Internet.

Broadband Status	
Line State	May be Up (connected) or Down (disconnected).
Broadband Connection	May be Up (connected) or Down (disconnected).
Downstream Sync Rate	This is the rate at which your connection can download (receive) data on your DSL line, in kilobits per second.
Upstream Sync Rate	This is the rate at which your connection can upload (send) data on your DSL line, in kilobits per second.
Modulation	Method of regulating the DSL signal. DMT (Discrete MultiTone) allows connections to work better when certain radio transmitters are present.
Data Path	Type of path used by the device's processor.
Broadband IPv4 Address	The public IP address of your device, whether dynamically or statically assigned.

Gateway IPv4 Address	Your ISP's gateway router IP address.
MAC Address	Your Gateway’s unique hardware address identifier.
Primary DNS	The IP Address of the Primary Domain Name Server.
Secondary DNS	The IP Address of the backup Domain Name Server, if available.
Primary DNS Name	The name of the Primary Domain Name Server.
Secondary DNS Name	The name of the backup Domain Name Server, if available.
MTU	Maximum Transmittable Unit before packets are broken into multiple packets.
IPv6	
Status	May be **Enabled** or **Disabled**.
Global Unicast IPv6 Address	The public IPv6 address of your device, whether dynamically or statically assigned.
Border Relay IPv4 Address	The public IPv4 address of your device.
IPv4 Statistics	
Transmit Packets	IPv4 packets transmitted.
Transmit Errors	Errors on IPv4 packets transmitted.
Transmit Discards	IPv4 packets dropped.
Downstream and Upstream Statistics	
SN Margin (db)	Signal to noise margin, in decibels. Reflects the amount of unwanted “noise” on the DSL line.
Line Attenuation	Amount of reduction in signal strength on the DSL line, in decibels.
Output Power (dBm)	Measure of power output in decibels (dB) referenced to one milliwatt (mW).
Errored Seconds	The number of uncorrected seconds after being down for seven consecutive seconds.
Loss of Signal	The absence of any signal for any reason, such as a disconnected cable or loss of power.
Loss of Frame	A signal is detected but cannot sync with signal caused by mismatched protocols, wrong ISP connection configuration, or faulty cable.
FEC Errors	(Forwarded Error Correction errors) Count of received errored packets that were fixed successfully with out a retry.
CRC Errors	Number of times data packets have had to be resent due to errors in transmission or reception.

Link: Configure

When you click the **Configure** link, the Broadband **Configure** screen appears.



Configure

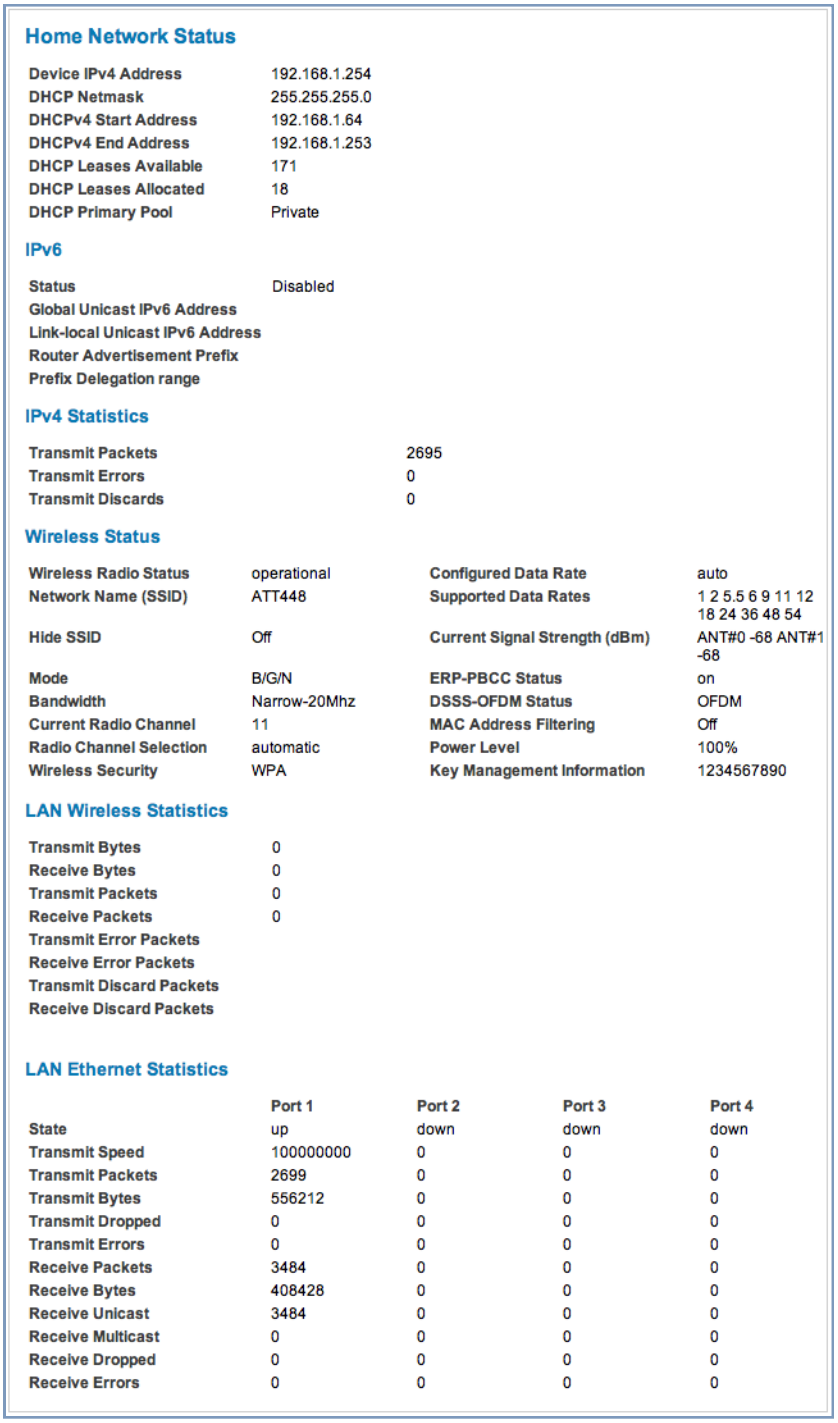
MTU 1500

The WAN connection is automatically configured. However, you can adjust the **MTU** (Maximum Transmittable Unit) value, if your service provider suggests it. The default 1500 is the maximum value, but some services require other values. 1492 is common.

If you make any change here, click the **Save** button.

Home Network

When you click the **Home Network** tab, the **Home Network Status** page appears.



Home Network Status

Device IPv4 Address	192.168.1.254
DHCP Netmask	255.255.255.0
DHCPv4 Start Address	192.168.1.64
DHCPv4 End Address	192.168.1.253
DHCP Leases Available	171
DHCP Leases Allocated	18
DHCP Primary Pool	Private

IPv6

Status	Disabled
Global Unicast IPv6 Address	
Link-local Unicast IPv6 Address	
Router Advertisement Prefix	
Prefix Delegation range	

IPv4 Statistics

Transmit Packets	2695
Transmit Errors	0
Transmit Discards	0

Wireless Status

Wireless Radio Status	operational	Configured Data Rate	auto
Network Name (SSID)	ATT448	Supported Data Rates	1 2 5.5 6 9 11 12 18 24 36 48 54
Hide SSID	Off	Current Signal Strength (dBm)	ANT#0 -68 ANT#1 -68
Mode	B/G/N	ERP-PBCC Status	on
Bandwidth	Narrow-20Mhz	DSSS-OFDM Status	OFDM
Current Radio Channel	11	MAC Address Filtering	Off
Radio Channel Selection	automatic	Power Level	100%
Wireless Security	WPA	Key Management Information	1234567890

LAN Wireless Statistics

Transmit Bytes	0
Receive Bytes	0
Transmit Packets	0
Receive Packets	0
Transmit Error Packets	
Receive Error Packets	
Transmit Discard Packets	
Receive Discard Packets	

LAN Ethernet Statistics

	Port 1	Port 2	Port 3	Port 4
State	up	down	down	down
Transmit Speed	100000000	0	0	0
Transmit Packets	2699	0	0	0
Transmit Bytes	556212	0	0	0
Transmit Dropped	0	0	0	0
Transmit Errors	0	0	0	0
Receive Packets	3484	0	0	0
Receive Bytes	408428	0	0	0
Receive Unicast	3484	0	0	0
Receive Multicast	0	0	0	0
Receive Dropped	0	0	0	0
Receive Errors	0	0	0	0

The **Home Network Status** page displays information about the Gateway’s local area network.

Home Network Status	
Device IPv4 Address	The Gateway's own IP address on the network.
DHCP Netmask	The Gateway's own netmask on the network.
DHCPv4 Start Address	The starting IP address of the DHCP range served by the Gateway.
DHCPv4 End Address	The ending IP address of the DHCP range served by the Gateway.
DHCP Leases Available	The number of IP addresses of the DHCP range available to be served by the Gateway.
DHCP Leases Allocated	The number of IP addresses of the DHCP range currently being served by the Gateway.
DHCP Primary Pool	Source pool of the IP addresses served by the Gateway, Public or Private.

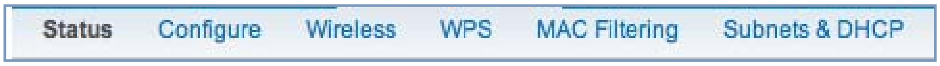
IPv6	
Status	May be **Enabled** or **Disabled**.
Global Unicast IPv6 Address	The public IPv6 address of your device, whether dynamically or statically assigned.
Link-local Unicast IPv6 Address	The private IPv6 address of your device, whether dynamically or statically assigned.
Router Advertisement Prefix	The IPv6 prefix to include in router advertisements.
Prefix Delegation range	The IPv6 prefix range from which prefixes can be delegated to clients by specifying an IPv6 prefix

IPv4 Statistics	
Transmit Packets	IPv4 packets transmitted.
Transmit Errors	Errors on IPv4 packets transmitted.
Transmit Discards	IPv4 packets dropped.

Wireless Status	
Wireless Radio Status	Indicates whether the Wi-Fi radio is operational or off.
Network Name (SSID)	This is the name or ID that is displayed to a client scan. The default SSID for the Gateway is **attxxx** where **xxx** is the last 3 digits of the serial number located on the side of the Gateway.
Hide SSID	May be either **On** or **Off**. If On, your SSID will not appear in a client scan.
Mode	May be 802.11**b** only, 802.11**g** only, 802.11**n**, or 802.11 **b+g+n**.
Bandwidth	The capacity of the wireless LAN to carry traffic. May be **wide** or **narrow**.
Current Radio Channel	The radio channel that your Wi-Fi network is broadcasting on.
Radio Channel Selection	May be set to **automatic** or manually selected.
Wireless Security	The type of wireless encryption security in use. May be **Disabled**, **WPA-PSK** or **WEP**, **Default Key** or **Manual**.
Configured Data Rate	This is the rate that you have configured the wireless driver to use.
Supported Data Rates	These are the rates the wireless driver is actually currently advertising and using. This is a combination of the Configured Rates, plus any run-time limitations that the environment is incurring (for instance, the presence of legacy clients in the area can limit the offering of higher rates).
Current Signal Strength (dBm)	This is an average measure of how strong the signals received from clients are.

ERP-PBCC Status	This tells whether or not the Gateway is honoring legacy 802.11b compatibility mode.
DSSS-OFDM Status	This is the wireless modulation in use. DSS if in **b-only** mode, OFDM otherwise.
MAC Address Filtering	May be either **On** or **Off**. If On, you can accept or block client devices from your WLAN based on their MAC address.
Power Level	May be adjusted up to 100%, lower if multiple wireless access points are in use, and might interfere with each other.
Key Management Information	Shows the information of the security encryption key in use.
LAN Wireless Statistics	
Bytes Transmitted	Number of bytes transmitted on the Wi-Fi network.
Bytes Received	Number of bytes received on the Wi-Fi network.
Packets Transmitted	Number of packets transmitted on the Wi-Fi network.
Packets Received	Number of packets received on the Wi-Fi network.
Error Packets Transmitted	This is the number of errors on packets transmitted on the Wi-Fi network.
Error Packets Received	This is the number of errors on packets received on the Wi-Fi network.
Discard Packets Transmitted	This is the number of packets transmitted on the Wi-Fi network that were dropped.
Discard Packets Received	This is the number of packets received on the Wi-Fi network that were dropped.
LAN Ethernet Statistics	
State	**up** or **down**
Transmit Speed	This is the maximum speed of which the port is capable.
Transmit Packets	This is the number of packets sent out from the port.
Transmit Bytes	This is the number of bytes sent out from the port.
Transmit Dropped	This is the number of packets sent out from the port that were dropped.
Transmit Errors	This is the number of errors on packets sent out from the port.
Receive Packets	This is the number of packets received on the port.
Receive Bytes	This is the number of bytes received on the port.
Receive Unicast	This is the number of unicast packets received on the port.
Receive Multicast	This is the number of multicast packets received on the port.
Receive Dropped	This is the number of packets received on the port that were dropped.
Receive Errors	This is the number of errors on packets received on the port.

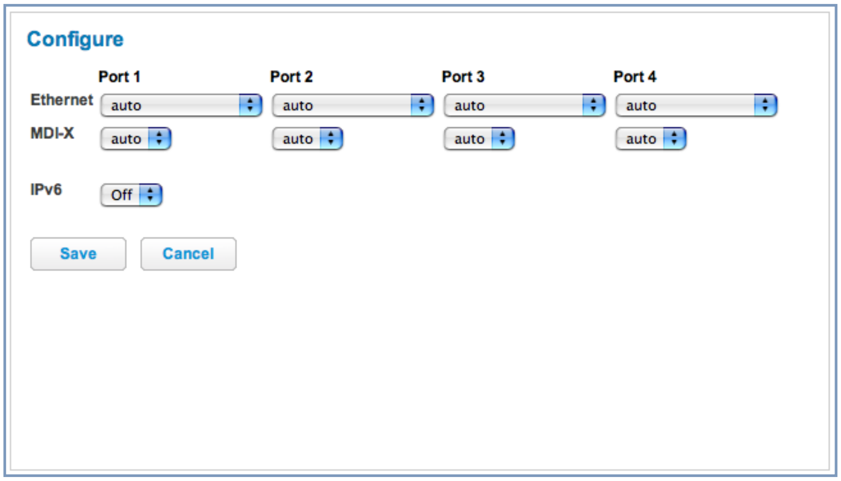
The links at the top of the Home Network page access a series of pages to allow you to configure and monitor features of your device. The following sections give brief descriptions of these pages.



- “Configure” on page 34
- “Wireless” on page 35
- “WPS” on page 39
- “MAC Filtering” on page 40
- “Subnets & DHCP” on page 41

Link: Configure

When you click the **Configure** link, the **Configure** page for the Ethernet LAN appears.



Configure

	Port 1	Port 2	Port 3	Port 4
Ethernet	auto	auto	auto	auto
MDI-X	auto	auto	auto	auto

IPv6: Off

For each **Ethernet** Port, 1 through 4, you can select:

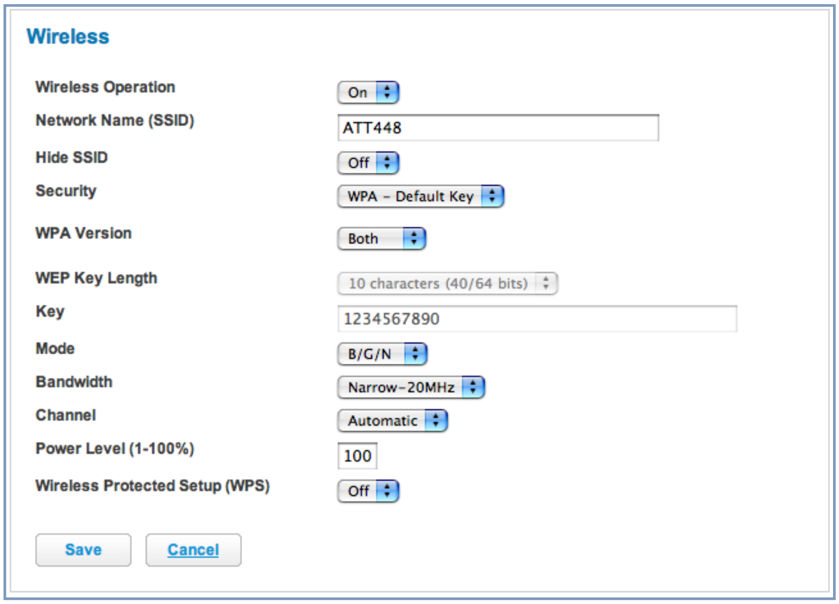
- **Ethernet** – auto (the default self-sensing rate), 10M full- or half-duplex, 100M full- or half-duplex, or 1G full- or half-duplex.
- **MDI-X** – auto (the default self-sensing crossover setting), **off**, or **on**.

You can also enable or disable **IPv6** if your LAN devices support or require it. Select **On** or **Off** from the pull-down menu.

Click the **Save** button.

Link: Wireless

When you click the **Wireless** link the Wireless page appears. The Wireless page displays the status of your Wireless LAN elements.



Wireless

Wireless Operation	On
Network Name (SSID)	ATT448
Hide SSID	Off
Security	WPA - Default Key
WPA Version	Both
WEP Key Length	10 characters (40/64 bits)
Key	1234567890
Mode	B/G/N
Bandwidth	Narrow-20MHz
Channel	Automatic
Power Level (1-100%)	100
Wireless Protected Setup (WPS)	Off

The Wireless page's center section contains a summary of the Wireless Access Point's configuration settings and operational status.

Summary Information	
Field	**Status and/or Description**
General Information	
Wireless Operation	May be either ***On*** or ***Off.***
Network Name (SSID)	This is the name or ID that is displayed to a client scan. The default SSID for the Gateway is ***attxxx*** where ***xxx*** is the last 3 digits of the serial number located on the side of the gateway.
Hide SSID	May be either ***Enabled*** or ***Disabled***. If Enabled, your SSID will not appear in a client scan.
Security	The type of wireless encryption security in use. May be ***OFF-No Privacy***, ***WPA-PSK*** or ***WEP***, ***Default Key*** or ***Manual***.
WPA Version	If WPA is selected, may be **Both**, **WPA-1**, or **WPA-2**,.
WEP Key Length	May be 10 characters for 40/64-bit, or 26 characters for 128-bit WP encryption.
Key	Here you can enter a manual encryption key.
Mode	May be 802.11**b** only, 802.11**g** only, 802.11**n**, or 802.11 **b+g+n**.
Bandwidth	The capacity of the wireless LAN to carry traffic. May be ***wide*** or ***narrow***.
Channel	The radio channel that your Wi-Fi network is broadcasting on.
Power Level	May be adjusted up to 100%, lower if multiple wireless access points are in use, and might interfere with each other.
Wireless Protected Setup (WPS)	May be either ***On*** or ***Off.***

- The **Wireless Operation** function is automatically enabled by default. If you uncheck the checkbox, the Wireless Options are disabled, and the Wireless Access Point will not provide or broadcast its wireless LAN services.

- **Network Name (SSID)** – preset to a number unique to your unit. You can either leave it as is, or change it by entering a freeform name of up to 32 characters, for example "Hercule's Wireless LAN". On client PCs' software, this might also be called the Network Name. The Wireless ID is used to identify this particular wireless LAN. Depending on their operating system or client wireless card, users must either:
  • select from a list of available wireless LANs that appear in a scanned list on their client
  • or enter this name on their clients in order to join this wireless LAN.
- **Hide SSID** – If enabled, this mode hides the wireless network from the scanning features of wireless client computers. Unless both the wireless clients and the Gateway share the same Network Name (SSID) in hidden mode, the Gateway's wireless LAN will not appear as an available network when scanned for by wireless-enabled computers. Members of the hidden WLAN must log onto the Gateway's wireless network with the identical SSID as that configured in the Gateway.

  Closed System mode is an ideal way to increase wireless security and to prevent casual detection by unwanted neighbors, office users, or malicious users such as hackers. If you do not enable Hide SSID, it is more convenient, but potentially less secure, for clients to access your WLAN by scanning available access points. You must decide based on your own network requirements.
- **Security, WPA Version**, **WEP Key Length**, **Key** – see "Wireless Security" on page 37.
- **Mode** – The pull-down menu allows you to select and lock the Gateway into the wireless transmission mode you want: **B/G/N**, **B-only**, **B/G**, **G-only**, or **N-only.**

  For compatibility with clients using 802.11b (up to 11 Mbps transmission), 802.11g (up to 20+ Mbps), 802.11a (up to 54 Mbit/s using the 5 GHz band), or 802.11n (from 54 Mbit/s to 600 Mbit/s with the use of four spatial streams at a channel width of 40 MHz), select **B/G/N**. To limit your wireless LAN to one mode or the other, select **G-only**, **N-only**, or **B-only**, or some combination that applies to your setup.

NOTE:

If you choose to limit the operating mode to 802.11b or 802.11g only, clients using the mode you excluded will not be able to connect.

- **Bandwidth** – May only be selected if mode is some combination of 802.11**n** (from 54 Mbit/s to 600 Mbit/s with the use of four spatial streams at a channel width of 40 MHz). Measure of the width of a range of frequencies, in megahertz.
- **Channel** (1 through 11, for North America) on which the network will broadcast. This is a frequency range within the 2.4Ghz band. Channel selection depends on government regulated radio frequencies that vary from region to region. Channel selection can have a significant impact on performance, depending on other wireless activity close to this Wireless Access Point. You need not select a channel at any of the computers on your wireless network. They will automatically scan available channels seeking a Gateway broadcasting on the SSID for which they are configured.

  The **Automatic** setting allows the Wireless Access Point to determine the best channel to broadcast automatically.
- **Wireless Power Level** – Sets the wireless transmit power, scaling down the Wireless Access Point's wireless transmit coverage by lowering its radio power output. Default is **100%** power. Transmit power settings are useful in large venues with multiple wireless routers where you want to reuse channels. Since there are only three non-overlapping channels in the 802.11 spectrum, it helps to size the Wireless Access Point's cell to match the location. This allows you to install a router to cover a small "hole" without conflicting with other routers nearby.
- **Wireless Protected Setup (WPS)** is a not a new security protocol. It is simply an easier way to use existing protocols to provide greater security for your wireless network connections.

  By default, Privacy is set to Wireless Protected Access (WPA-PSK). WPS allows you to automatically generate a new strong WPA key for your Gateway and any client devices on your wireless network.

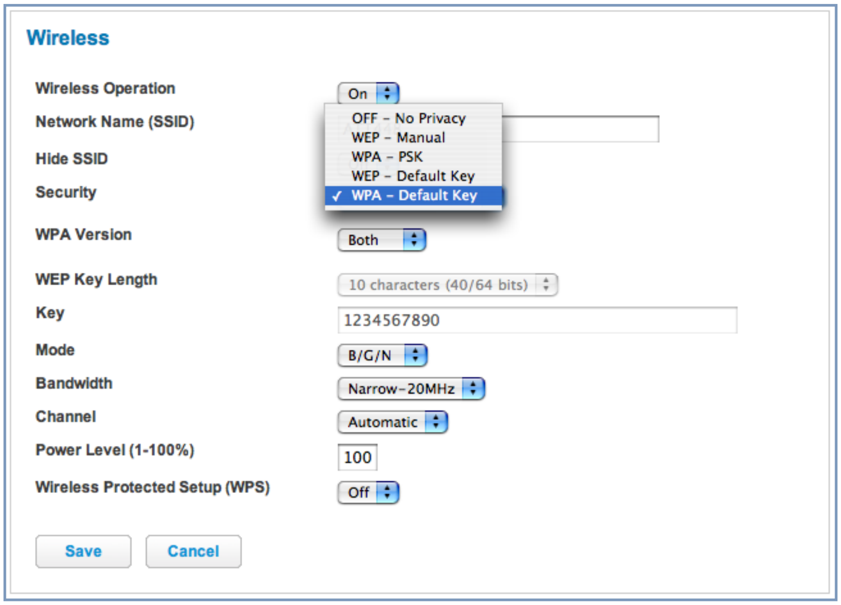
Note:

Not all client wireless devices support WPS. Refer to their documentation.

Wireless Security

By default, Wireless Security is set to ***WPA-PSK*** with a pre-defined **WPA-Default Key** (**W**ireless **P**rotected **A**ccess **P**re-**S**hared **K**ey).

Other options are available from the **Security** pull-down menu:



Wireless

Wireless Operation: On

Network Name (SSID):

Hide SSID

Security: WPA - Default Key

WPA Version: Both

WEP Key Length: 10 characters (40/64 bits)

Key: 1234567890

Mode: B/G/N

Bandwidth: Narrow-20MHz

Channel: Automatic

Power Level (1-100%): 100

Wireless Protected Setup (WPS): Off

- **WEP - Manual:** WEP Security is a Privacy option that is based on encryption between the Router and any PCs ("clients") you have with wireless cards. If you are not using WPA-PSK Privacy, you can use WEP encryption instead. For this encryption to work, both your Wireless Access Point and each client must share the same Wireless ID (SSID), and both must be using the same encryption keys. See "WEP-Manual" on page 37.
- **WPA-PSK:** allows you to enter your own key, the most secure option for your wireless network. The key can be between 8 and 63 characters, but for best security it should be at least 20 characters.

  If you select **WPA-PSK** as your privacy setting, the **WPA Version** pull-down menu allows you to select the WPA version(s) that will be required for client connections. Choices are:

  Both, for maximum interoperability,

  WPA-1, for backward compatibility,

  WPA-2, for maximum security.

  All clients must support the version(s) selected in order to successfully connect.

  Be sure that your Wi-Fi client adapter supports this option. Not all Wi-Fi clients support WPA-PSK.
- **OFF - No Privacy:** This mode disables privacy on your network, allowing any wireless users to connect to your wireless LAN. Use this option if you are using alternative security measures such as VPN tunnels, or if your network is for public use.

Click the **Save** button.

WEP-Manual

You can provide a level of data security by enabling WEP (Wired Equivalent Privacy) for encryption of network data. You can enable 40- or 128-bit WEP Encryption (depending on the capability of your client wireless card) for IP traffic on your LAN.

WEP - Manual allows you to enter your own encryption keys manually. This is a difficult process, but only needs to be done once. Avoid the temptation to enter all the same characters.

Key Length: The pull-down menu selects the length of each encryption key. The longer the key, the stronger the encryption and the more difficult it is to break the encryption.

Key: You enter a key using hexadecimal digits. For 40/64-bit encryption, you need ten digits; 26 digits for 128-bit WEP. Hexadecimal characters are 0 – 9, and a – f.

Examples:

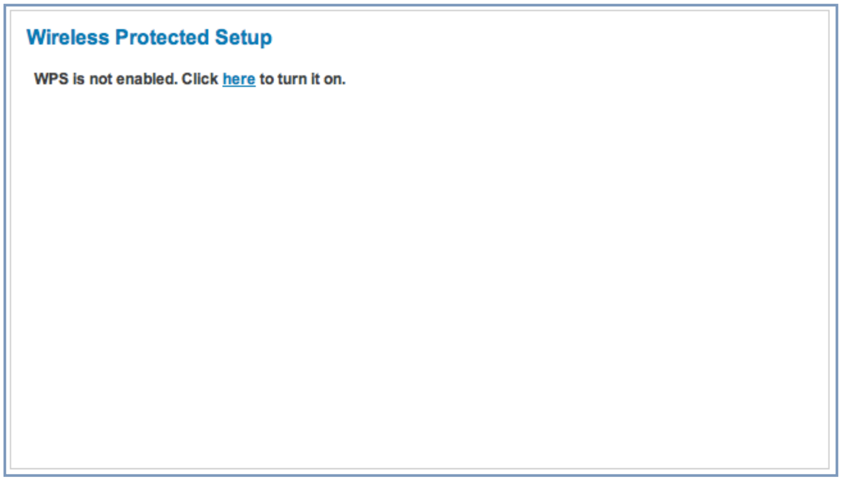
- 40 bits: 02468ACE02
- 128 bits: 0123456789ABCDEF0123456789

Any WEP-enabled client must have an identical key of the same length as the Router, in order to successfully receive and decrypt the traffic. Similarly, the client also has a 'default' key that it uses to encrypt its transmissions. In order for the Router to receive the client's data, it must likewise have the identical key of the same length.

Click the click **Save** button.

Link: WPS

Wireless Protected Setup (WPS) is a not a new security protocol. It is simply an easier way to use existing protocols to provide greater security for your wireless network connections.



Wireless Protected Setup

WPS is not enabled. Click here to turn it on.

By default, Privacy is set to Wireless Protected Access (WPA-PSK). WPS allows you to automatically generate a new strong WPA key for your Gateway and any client devices on your wireless network.

Note:

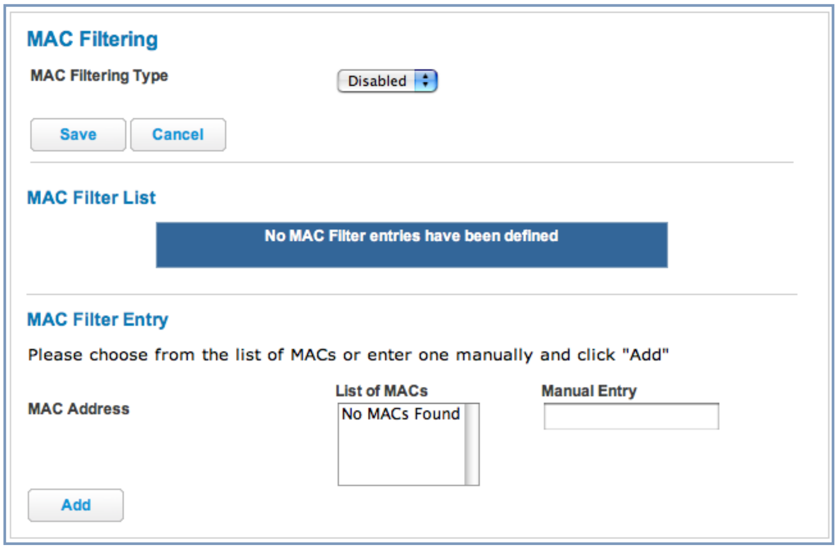
Not all client wireless devices support WPS. Refer to their documentation.

Adding wireless clients to your network is easier using Wireless Protected Setup (WPS). Before you begin, be sure WPS is enabled on your device. WPS clients will be "auto-configured" by pushbutton or PIN-entry. Older, non-WPS clients can still be added to the network by configuring them the standard way with WPA-PSK or WEP. The client machine(s) to be added should be powered on and their wireless cards operational. Follow any instructions that came with your wireless client devices.

Click the **here** link to proceed.

Link: MAC Filtering

When you click the **MAC Filtering** link the **MAC Filtering** page appears.



MAC Filtering

MAC Filtering Type: Disabled

MAC Filter List

No MAC Filter entries have been defined

MAC Filter Entry

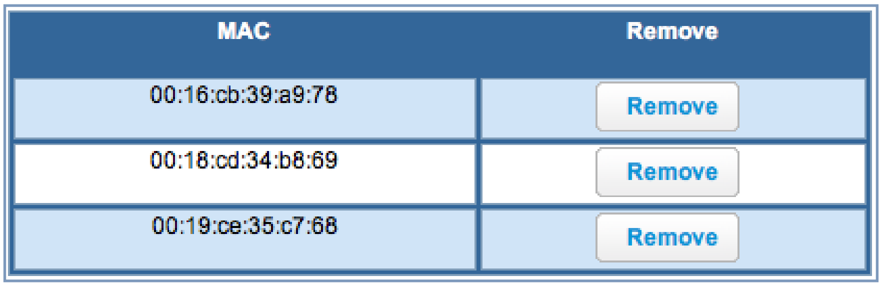
Please choose from the list of MACs or enter one manually and click "Add"

MAC Address — List of MACs: No MACs Found — Manual Entry:

MAC Filtering allows you to specify which client PCs are allowed to join the wireless LAN by unique hardware (MAC) address.

- To enable this feature, select **Blacklist** or **Whitelist** from the **MAC Filtering Type** menu. **Blacklist** means that only MAC addresses you specify will be denied access; **Whitelist** means that only MAC addresses you specify will be allowed access.
- You add wireless clients that you want to Whitelist or Blacklist for your wireless LAN by selecting them from the **List of MACs** or by entering the MAC addresses in the **Manual Entry** field provided.
- Click the **Add** button.

Your entries will be added to a list of clients that will be either authorized (Whitelisted) or disallowed (Blacklisted) depending on your selection.



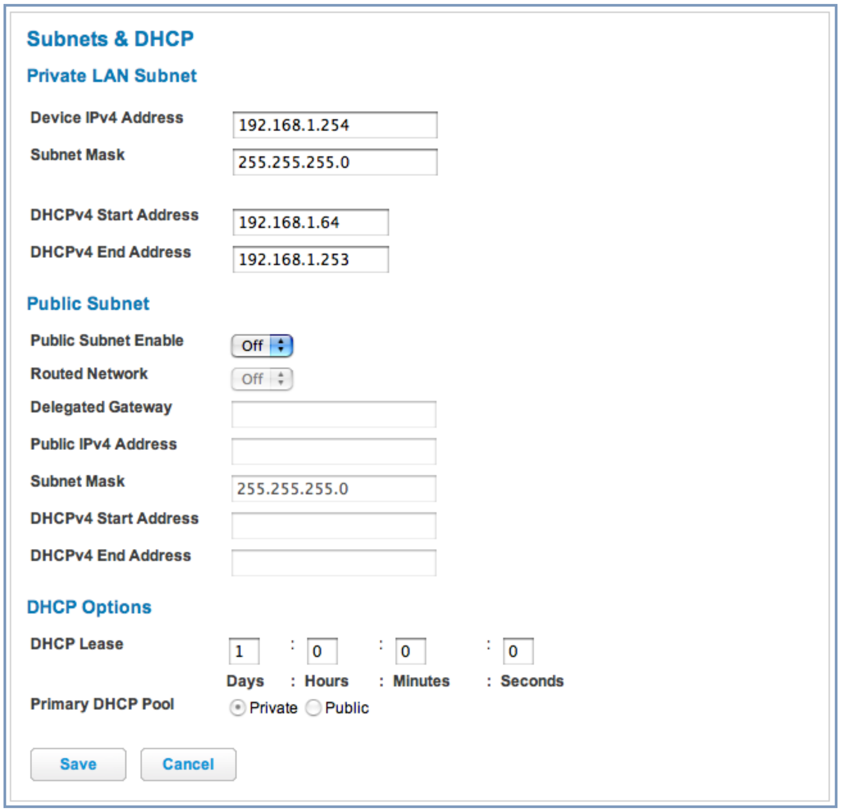
MAC	Remove
00:16:cb:39:a9:78	Remove
00:18:cd:34:b8:69	Remove
00:19:ce:35:c7:68	Remove

- Click the **Save** button.

You can **Add** or **Remove** any of your entries later by returning to this page.

Link: Subnets & DHCP

When you click the **Subnets & DHCP** link, the **Subnets & DHCP** page appears.



Subnets & DHCP

Private LAN Subnet

Device IPv4 Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Start Address	192.168.1.64
DHCPv4 End Address	192.168.1.253

Public Subnet

Public Subnet Enable	Off
Routed Network	Off
Delegated Gateway	
Public IPv4 Address	
Subnet Mask	255.255.255.0
DHCPv4 Start Address	
DHCPv4 End Address	

DHCP Options

DHCP Lease	1	:	0	:	0	:	0
	Days	:	Hours	:	Minutes	:	Seconds
Primary DHCP Pool	● Private ○ Public						

The Server configuration determines the functionality of your DHCP Settings. This functionality enables the Gateway to assign your LAN computer(s) a “private” IP address and other parameters that allow network communication. This feature simplifies network administration because the Gateway maintains a list of IP address assignments. Additional computers can be added to your LAN without the hassle of configuring an IP address. This is the default mode for your Gateway.

Private LAN Subnet

- **Device IP Address:** The IP address of your Gateway as seen from the LAN
- **Subnet Mask:** Subnet mask of your LAN
- **DHCP Start Address:** First IP address in the range being served to your LAN by the Gateway's DHCP server
- **DHCP End Address:** Last IP address in the range being served to your LAN by the Gateway's DHCP server

Public Subnet

- **Public Subnet Enable**: If you select On from the pull-down menu, you can enable a second subnet to distribute public addresses to DHCP clients.
- **Routed Network**: If **Public Subnet Enable** is checked, this selection permits you to specify **Gateway Selection** by the Gateway **Router IP Address** or its **Router Name**.
- **Delegated Gateway**: The IP address for a router set up behind this Gateway, if one is used.
- **Public IPv4 Address**: The IP address of your Gateway as seen from the WAN
- **Subnet Mask**: Public subnet mask
- **DHCPv4 Start Address**: First IP address in the range being served from a DHCP public pool.
- **DHCPv4 End Address**: Last IP address in the range being served from a DHCP public pool.

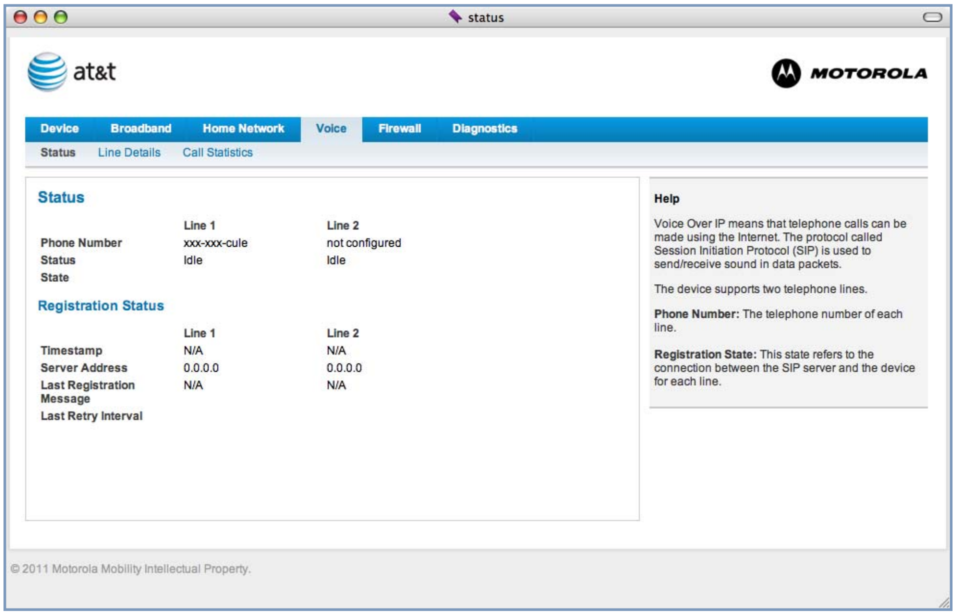
DHCP Options

- **DHCP Lease Time**: Specifies the default length for DHCP leases issued by the Router. Enter lease time in dd:hh:mm:ss (days/hours/minutes/seconds) format.
- **Primary DHCP Pool**: Choose the source of the DHCP pool IP address assignment by selecting either the **Private** (local to your LAN) or **Public** (assigned remotely) radio button.

If you make any changes here, click the **Save** button, and if prompted, restart the Gateway.

Voice

If you click the **Voice** ink, the **Voice** page appears.



Status

	Line 1	Line 2
Phone Number	xxx-xxx-cule	not configured
Status	Idle	Idle
State		

Registration Status

	Line 1	Line 2
Timestamp	N/A	N/A
Server Address	0.0.0.0	0.0.0.0
Last Registration Message	N/A	N/A
Last Retry Interval		

Help

Voice Over IP means that telephone calls can be made using the Internet. The protocol called Session Initiation Protocol (SIP) is used to send/receive sound in data packets.

The device supports two telephone lines.

Phone Number: The telephone number of each line.

Registration State: This state refers to the connection between the SIP server and the device for each line.

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Voice-over-IP (VoIP) refers to the ability to make voice telephone calls over the Internet. This differs from traditional phone calls that use the Public Switched Telephone Network (PSTN). VoIP calls use an Internet protocol, Session Initiation Protocol (SIP), to transmit sound over a network or the Internet in the form of data packets.

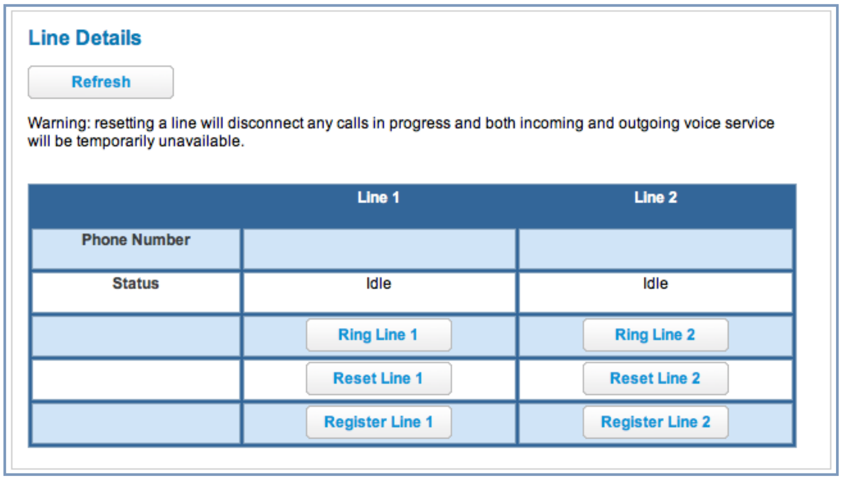
- The Voice page displays information about your VoIP phone lines, if configured. Your Gateway supports two phones, **Line 1** and **Line 2**.
- If either one or both are registered with a SIP server by your service provider or not registered, the Voice page will display their **Registration Status**.

The links at the top of the Voice page access a series of pages to allow you to configure and monitor features of your device. The following sections give brief descriptions of these pages.

- “Line Details” on page 44
- “Call Statistics” on page 45

Link: Line Details

When you click the **Line Details** link, the **Line Details** page appears.



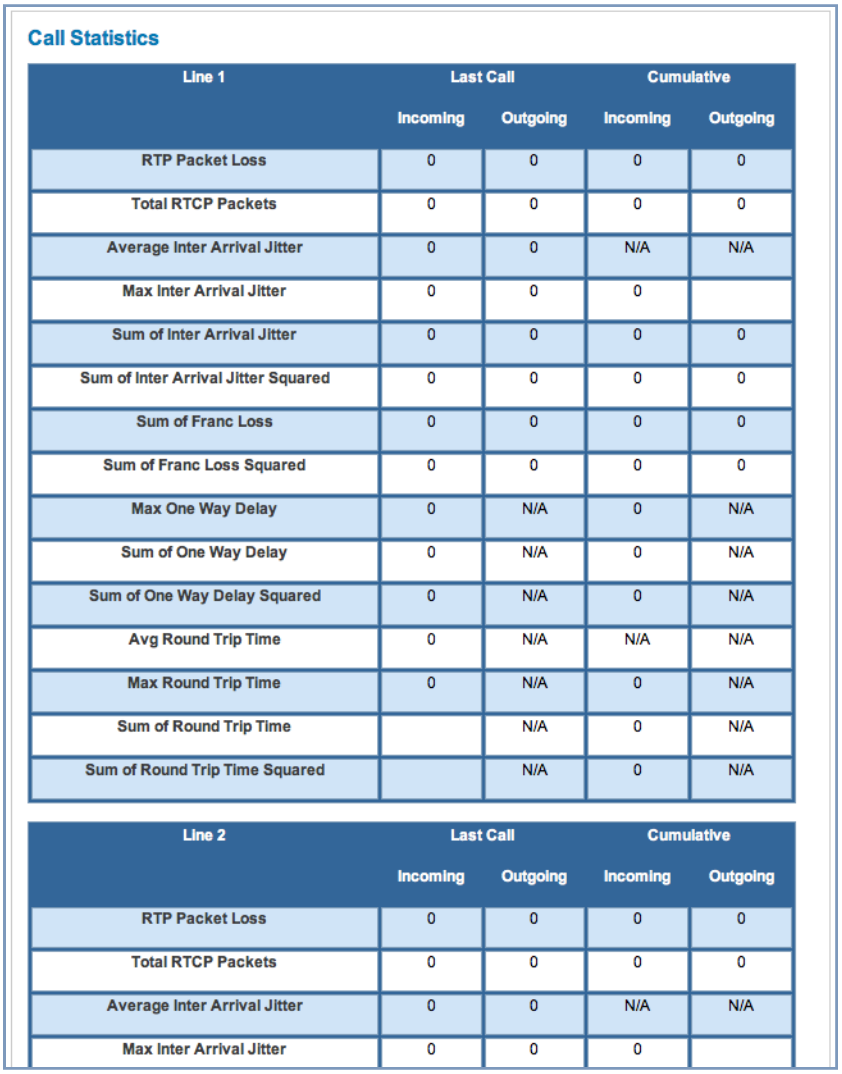
Warning: resetting a line will disconnect any calls in progress and both incoming and outgoing voice service will be temporarily unavailable.

	Line 1	Line 2
Phone Number		
Status	Idle	Idle
	Ring Line 1	Ring Line 2
	Reset Line 1	Reset Line 2
	Register Line 1	Register Line 2

- If your service provider has enabled your VoIP phone lines, you can register them by clicking the **Register Line 1** or **Register Line 2** button(s).
- To test if the lines are enabled, click the **Ring Line 1** or **Ring Line 2** button(s). If enabled and registered, the respective phone will ring until you click the **Stop Ring Line 1** or **Stop Ring Line 2** buttons.
- To update the display, click the **Refresh** button.

Link: Call Statistics

When you click **Call Statistics**, the **Call Statistics** page appears.



Call Statistics

Line 1	Last Call		Cumulative	
	Incoming	Outgoing	Incoming	Outgoing
RTP Packet Loss	0	0	0	0
Total RTCP Packets	0	0	0	0
Average Inter Arrival Jitter	0	0	N/A	N/A
Max Inter Arrival Jitter	0	0	0	
Sum of Inter Arrival Jitter	0	0	0	0
Sum of Inter Arrival Jitter Squared	0	0	0	0
Sum of Franc Loss	0	0	0	0
Sum of Franc Loss Squared	0	0	0	0
Max One Way Delay	0	N/A	0	N/A
Sum of One Way Delay	0	N/A	0	N/A
Sum of One Way Delay Squared	0	N/A	0	N/A
Avg Round Trip Time	0	N/A	N/A	N/A
Max Round Trip Time	0	N/A	0	N/A
Sum of Round Trip Time		N/A	0	N/A
Sum of Round Trip Time Squared		N/A	0	N/A

Line 2	Last Call		Cumulative	
	Incoming	Outgoing	Incoming	Outgoing
RTP Packet Loss	0	0	0	0
Total RTCP Packets	0	0	0	0
Average Inter Arrival Jitter	0	0	N/A	N/A
Max Inter Arrival Jitter	0	0	0	

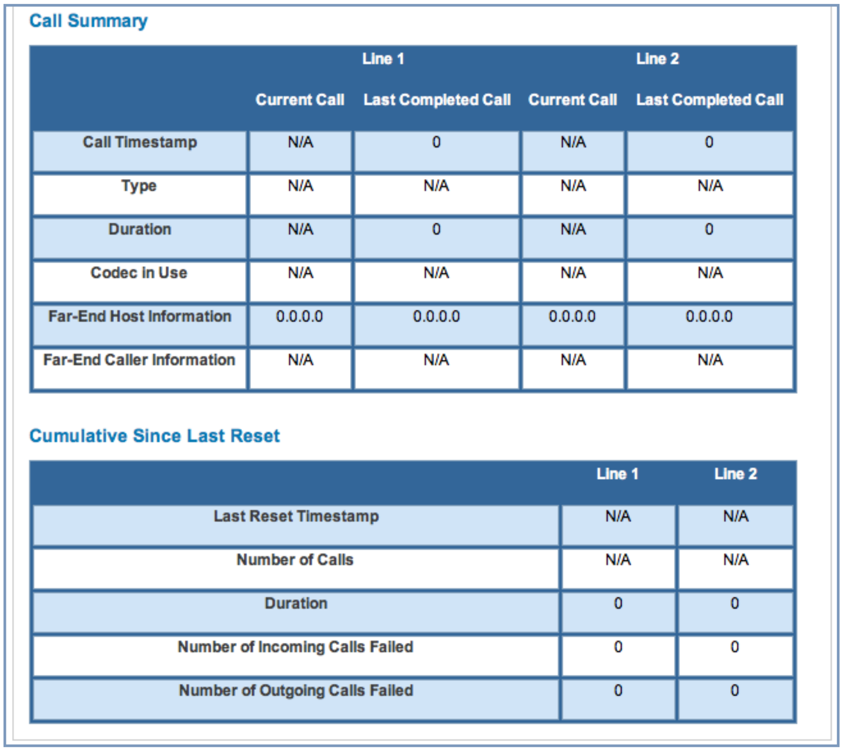
For **Line 1** and **Line 2**:, the two available phone lines, the Call Statistics page displays the following information:

Call Statistics - Line 1 and Line 2

Last Call/Cumulative – Incomin/Outgoing

RTP Packet Loss	Real-time Transport Protocol packets dropped
Total RTCP Packets	Total Real-time Transport Control Protocol packets
Average Inter Arrival Jitter	This is calculated continuously as each data packet is received and averaged.
Max Inter Arrival Jitter	This is the maximum value recorded as each data packet is received.
Sum of Inter Arrival Jitter	This is calculated continuously as each data packet is received and totalled.
Sum of Inter Arrival Jitter Squared	This is calculated continuously as each data packet is received and the total is squared.

Sum of Franc Loss	Fraction Lost: The fraction of RTP data packets lost since the previous SR or RR packet was sent. This fraction is defined to be the number of packets lost divided by the number of packets expected. This will be calculated on every RTCP SR packet. Sum of the fraction lost is calculated with all the RTCP packets.
Sum of Franc Loss Squared	Fraction lost is squared with every RTCP SR or RR packet. Sum of all this will give the Sum of Franc Loss Squared.
Max One Way Delay	One Way Delay will be calculated on every RTCP SR or RR packet. This value is (systime - lsr - dslr) / 2 lsr means last SR timestamp dslr means delay since last SR.
Sum of One Way Delay	The sum of all the one way delays calculated on every RTCP packet is displayed as Sum of One Way Delay.
Sum of One Way Delay Squared	One Way Delay is squared with every RTCP SR or RR packet. Sum of all this will give the Sum of One Way Delay Squared.
Avg Round Trip Time	Average time from this local source to destination address and back again for all logged calls
Max Round Trip Time	Maximum amount of time from this local source to destination address and back again for all logged calls
Sum of Round Trip Time	Sum of time from this local source to destination address and back again for all logged calls
Sum of Round Trip Time Squared	Sum squared of time from this local source to destination address and back again for all logged calls



Call Summary

	Line 1		Line 2	
	Current Call	Last Completed Call	Current Call	Last Completed Call
Call Timestamp	N/A	0	N/A	0
Type	N/A	N/A	N/A	N/A
Duration	N/A	0	N/A	0
Codec in Use	N/A	N/A	N/A	N/A
Far-End Host Information	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
Far-End Caller Information	N/A	N/A	N/A	N/A

Cumulative Since Last Reset

	Line 1	Line 2
Last Reset Timestamp	N/A	N/A
Number of Calls	N/A	N/A
Duration	0	0
Number of Incoming Calls Failed	0	0
Number of Outgoing Calls Failed	0	0

For **Line 1** and **Line 2**:, the two available phone lines, the Call Summary section displays the following information:

Call Summary - Line 1 and Line 2

Current Call/Last Completed Call

Call Timestamp	Date and Time of the current call
Type	May be Incoming or Outgoing
Duration	Length of time of call connection
Codec in Use	Audio codec used for decoding the call packet traffic.
Far-End Host Information	SIP server IP information: IP address and port number
Far-End Caller Information	Caller ID information, if available

Cumulative Since Last Reset

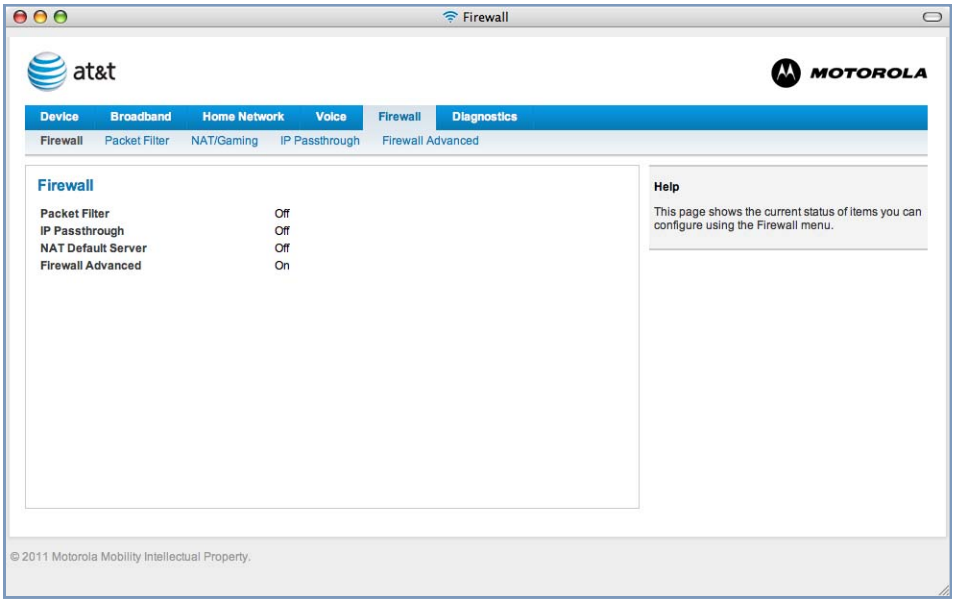
Last Reset Timestamp	Date and Time of the last call
Number of Calls	Total number of calls for each VoIP line
Duration	Time since the last call
Number of Incoming Calls Failed	Number of Incoming calls that fail to connect
Number of Outgoing Calls Failed	Number of Outgoing calls that fail to connect

Firewall

When you click the **Firewall** tab, the **Firewall** Status page appears. The Firewall page displays the status of your system firewall elements.

All computer operating systems are vulnerable to attack from outside sources, typically at the operating system or Internet Protocol (IP) layers. Stateful Inspection firewalls intercept and analyze incoming data packets to determine whether they should be admitted to your private LAN, based on multiple criteria, or blocked. Stateful inspection improves security by tracking data packets over a period of time, examining incoming and outgoing packets. Outgoing packets that request specific types of incoming packets are tracked; only those incoming packets constituting a proper response are allowed through the firewall.

Stateful inspection is a security feature that prevents unsolicited inbound access when NAT is disabled. You can configure UDP and TCP "no-activity" periods that will also apply to NAT time-outs if stateful inspection is enabled on the interface. Stateful Inspection parameters are active on a WAN interface only if enabled on your system. Stateful inspection can be enabled on a WAN interface whether NAT is enabled or not.



Firewall

Packet Filter	Off
IP Passthrough	Off
NAT Default Server	Off
Firewall Advanced	On

Help

This page shows the current status of items you can configure using the Firewall menu.

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The center section displays the following:

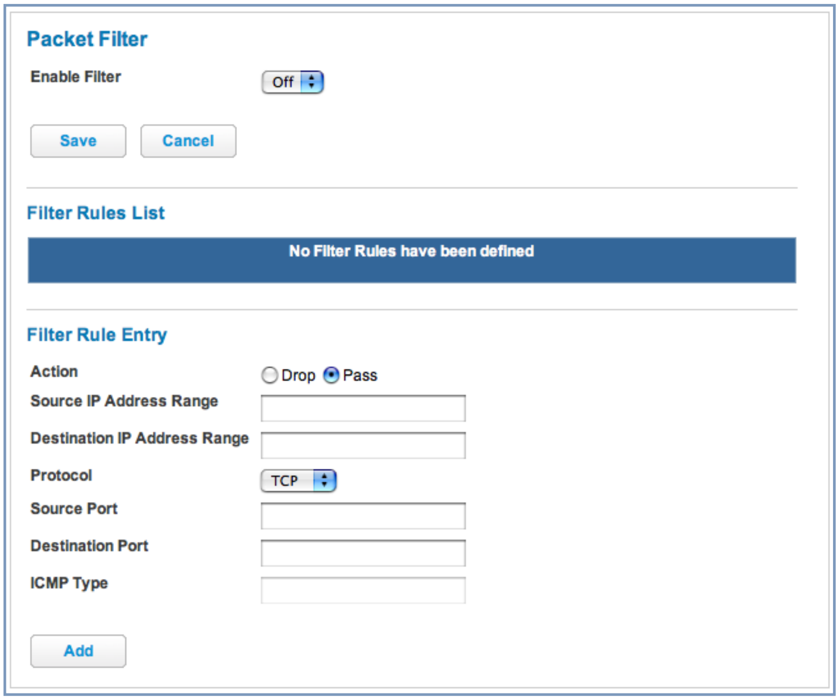
Packet Filter	May be On or Off
IP Passthrough	May be On or Off
NAT Default Server	May be On or Off
Firewall Advanced	May be On or Off

The links at the top of the Firewall page access a series of pages to allow you to configure security features of your device. The following sections give brief descriptions of these pages.

- "Packet Filter" on page 49
- "NAT/Gaming" on page 53
- "IP Passthrough" on page 58
- "Firewall Advanced" on page 60

Link: Packet Filter

When you click the **Packet Filter** link the **Packet Filter** screen appears.



Packet Filter

Enable Filter: Off

Filter Rules List

No Filter Rules have been defined

Filter Rule Entry

Action: ○ Drop ● Pass

Source IP Address Range

Destination IP Address Range

Protocol: TCP

Source Port

Destination Port

ICMP Type

Security should be a high priority for anyone administering a network connected to the Internet. Using packet filters to control network communications can greatly improve your network's security. The Packet Filter engine allows creation of a maximum of eight Filtersets. Each Filterset can have up to eight rules configured.

WARNING:

Before attempting to configure filters and filtersets, please read and understand this entire section thoroughly. The Motorola Gateway incorporating NAT has advanced security features built in. Improperly adding filters and filtersets increases the possibility of loss of communication with the Gateway and the Internet. Never attempt to configure filters unless you are local to the Gateway. Although using filtersets can enhance network security, there are disadvantages:

- Filters are complex. Combining them in filtersets introduces subtle interactions, increasing the likelihood of implementation errors.
- Enabling a large number of filters can have a negative impact on performance. Processing of packets will take longer if they have to go through many checkpoints in addition to NAT.
- Too much reliance on packet filters can cause too little reliance on other security methods. Filtersets are not a substitute for password protection, effective safeguarding of passwords, and general awareness of how your network may be vulnerable.

Motorola's packet filters are designed to provide security for the Internet connections made to and from your network. You can customize the Gateway's filtersets for a variety of packet filtering applications. Typically, you use filters to selectively admit or refuse TCP/IP connections from certain remote networks and specific hosts. You will also use filters to screen particular types of connections. This is commonly called firewalling your network.

Before creating filtersets, you should read the next few sections to learn more about how these powerful security tools work.

Parts of a filter

A filter consists of criteria based on packet attributes. A typical filter can match a packet on any one of the following attributes:

- The source IP address (where the packet was sent from)
- The destination IP address (where the packet is going)
- The type of higher-layer Internet protocol the packet is carrying, such as TCP or UDP

Other filter attributes

There are three other attributes to each filter:

- The filter's order (i.e., priority) in the filterset
- Whether the filter is currently active
- Whether the filter is set to forward packets or to block (discard) packets

Design guidelines

Careful thought must go into designing a new filterset. You should consider the following guidelines:

- Be sure the filterset's overall purpose is clear from the beginning. A vague purpose can lead to a faulty set, and that can actually make your network less secure.
- Be sure each individual filter's purpose is clear.
- Determine how filter priority will affect the set's actions. Test the set (on paper) by determining how the filters would respond to a number of different hypothetical packets.
- Consider the combined effect of the filters. If every filter in a set fails to match on a particular packet, the packet is:
  - Forwarded if all the filters are configured to discard (not forward)
  - Discarded if all the filters are configured to forward
  - Discarded if the set contains a combination of forward and discard filters

An approach to using filters

The ultimate goal of network security is to prevent unauthorized access to the network without compromising authorized access. Using filtersets is part of reaching that goal.

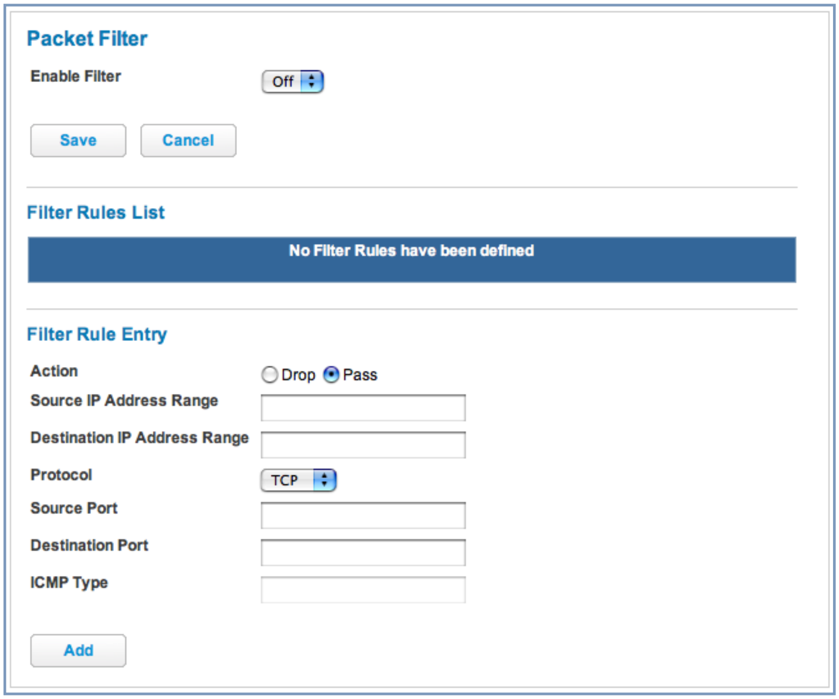
Each filterset you design will be based on one of the following approaches:

- That which is not expressly prohibited is permitted.
- That which is not expressly permitted is prohibited.

It is strongly recommended that you take the latter, and safer, approach to all of your filterset designs.

Working with Packet Filters

To work with filters, begin by accessing the **Packet Filter** pages.



Packet Filter

Enable Filter	Off

Save Cancel

Filter Rules List

No Filter Rules have been defined

Filter Rule Entry

Action	○ Drop ● Pass
Source IP Address Range	
Destination IP Address Range	
Protocol	TCP
Source Port	
Destination Port	
ICMP Type	

Add

Packet Filter

- **Enable Filter** – Select **On** from the pull-down menu to enable this filter rule.

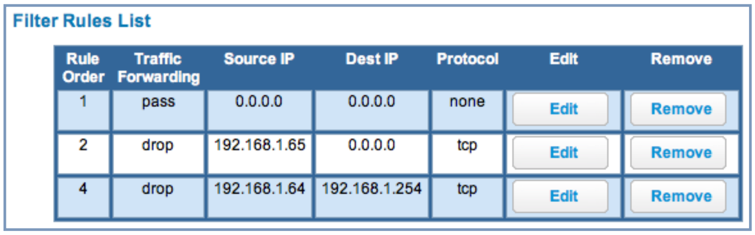
Filter Rule Entry

- **Action** – Select either the **drop** or **pass** radio buttons:
  • **drop**: If you select **drop**, the specified packets will be blocked.
  • **pass**: If you select **pass**, the specified packets will be forwarded.
- Enter the **Source IP Address** this filter will match on.
- Enter the **Destination IP Address** this filter will match on.
- Select **Protocol** from the pull-down menu: **ICMP**, **TCP**, **UDP**, or **None** to specify any another IP transport protocol.
- Enter the **Source Port** this filter will match on.
- Enter the **Destination Port** this filter will match on.
- If you selected **ICMP**, enter the **ICMP Type** here.

When you are finished configuring the filter, click the **Add** button, then the **Save** button to save the filter.

Filter Rules List

Your entries are displayed as a table.



Filter Rules List

Rule Order	Traffic Forwarding	Source IP	Dest IP	Protocol	Edit	Remove
1	pass	0.0.0.0	0.0.0.0	none	Edit	Remove
2	drop	192.168.1.65	0.0.0.0	tcp	Edit	Remove
4	drop	192.168.1.64	192.168.1.254	tcp	Edit	Remove

NOTE:

Default Forwarding Filter
If you create one or more filters that have a matching action of forward, then action on a packet matching none of the filters is to block any traffic.

Therefore, if the behavior you want is to force the routing of a certain type of packet and pass all others through the normal routing mechanism, you must configure one filter to match the first type of packet and apply Force Routing. A subsequent filter is required to match and forward all other packets.

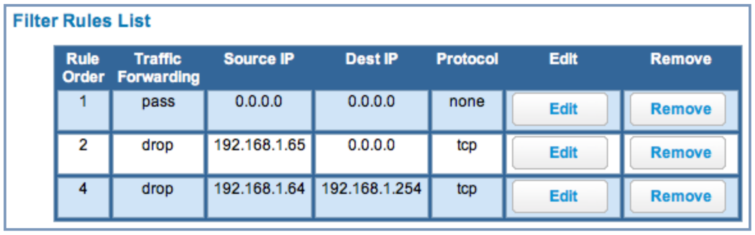
Management IP traffic
If the Force Routing filter is applied to source IP addresses, it may inadvertently block communication with the router itself. You can avoid this by preceding the Force Routing filter with a filter that matches the destination IP address of the Gateway itself.

Example:

To create a Packet Filter that will block telnet from one LAN client, block access to the Gateway's web interface from one LAN client and then allow all other traffic to pass from the LAN to the Gateway, you enable LAN Packet Filter and create filters and then apply them as an inbound filter.

Input Rules:

Pass	Source IP Address	Destination IP Address	Protocol
No	192.168.1.65	0.0.0.0	TCP
No	192.168.1.64	192.168.1.254	TCP
Yes	0.0.0.0	0.0.0.0	Any

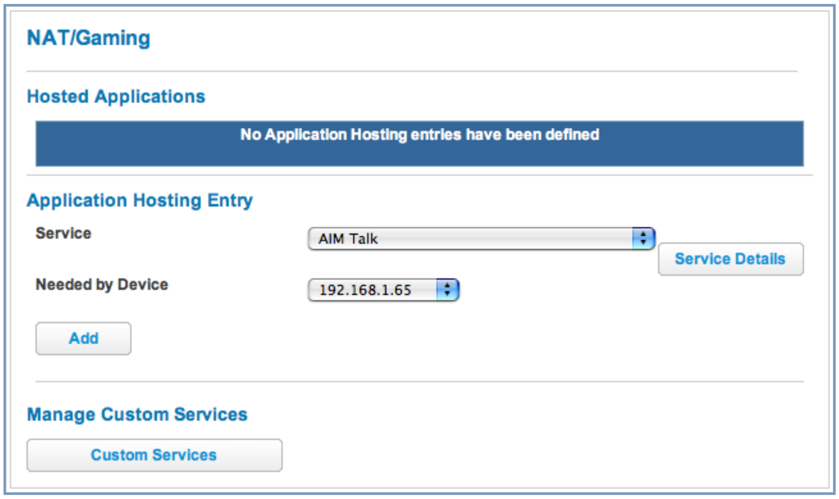


Filter Rules List

Rule Order	Traffic Forwarding	Source IP	Dest IP	Protocol	Edit	Remove
1	pass	0.0.0.0	0.0.0.0	none	Edit	Remove
2	drop	192.168.1.65	0.0.0.0	tcp	Edit	Remove
4	drop	192.168.1.64	192.168.1.254	tcp	Edit	Remove

Link: NAT/Gaming

When you click the **NAT/Gaming** button, the **NAT/Gaming** page appears.



NAT/Gaming

Hosted Applications

No Application Hosting entries have been defined

Application Hosting Entry

Service: AIM Talk

Needed by Device: 192.168.1.65

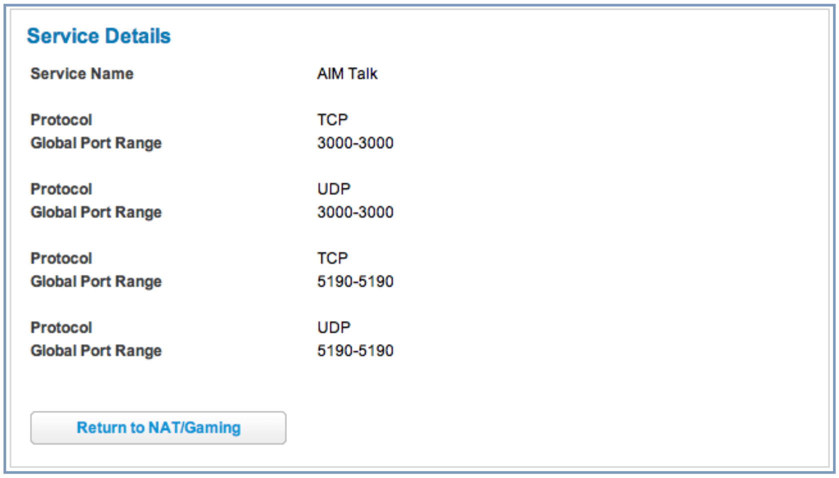
Manage Custom Services

NAT/Gaming allows you to host internet applications when NAT is enabled. You can host different games and software on different PCs.

From the **Service** pull-down menu, you can select any of a large number of predefined games and software. (See "List of Supported Games and Software" on page 56.)

In addition to choosing from these predefined services you can also select a user defined custom service. (See "Custom Services" on page 55.)

For each supported game or service, you can view the protocols and port ranges used by the game or service by clicking the **Service Details** button. For example:

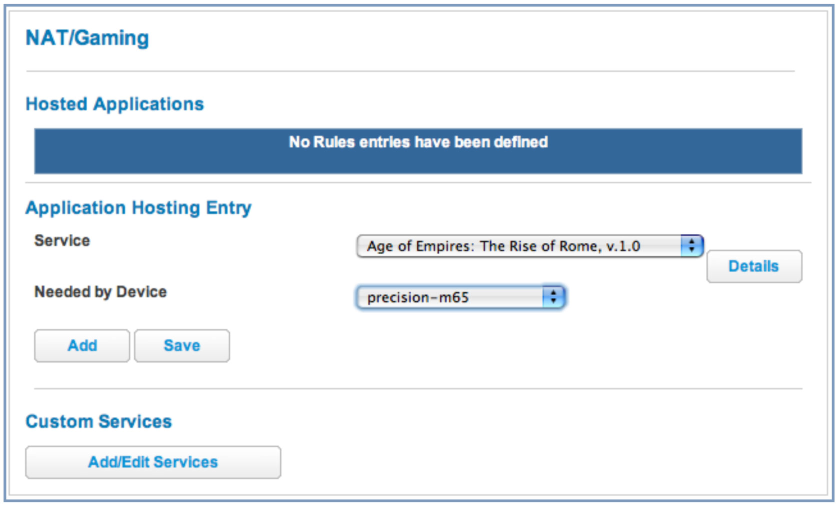


Service Details

Service Name	AIM Talk
Protocol	TCP
Global Port Range	3000-3000
Protocol	UDP
Global Port Range	3000-3000
Protocol	TCP
Global Port Range	5190-5190
Protocol	UDP
Global Port Range	5190-5190

Select a hosting device from the **Needed by Device** pull-down menu.

1. **Once you choose a software service or game, click Add.**
2. **Select a PC to host the software from the Select Host Device pull-down menu and click Save.**



NAT/Gaming

Hosted Applications

No Rules entries have been defined

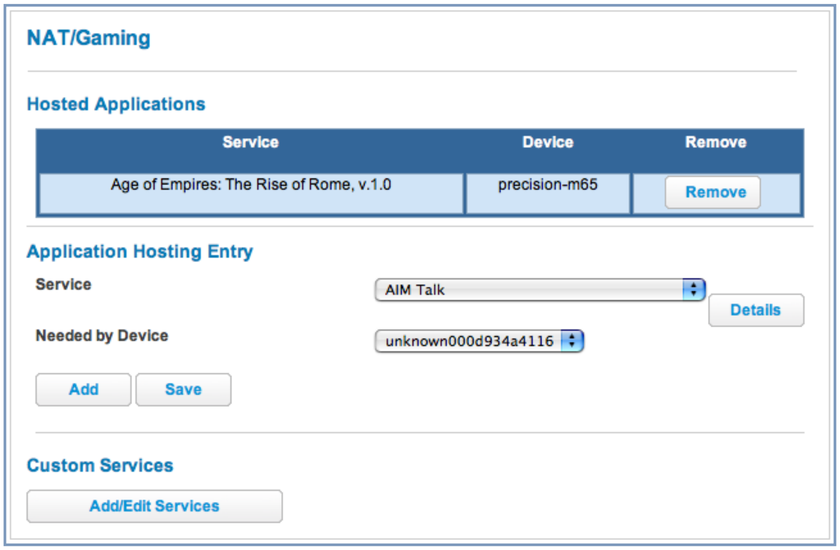
Application Hosting Entry

Service: Age of Empires: The Rise of Rome, v.1.0

Needed by Device: precision-m65

Custom Services

Each time you enable a software service or game your entry will be added to the list of **Service** names displayed on the NAT Configuration page.



NAT/Gaming

Hosted Applications

Service	Device	Remove
Age of Empires: The Rise of Rome, v.1.0	precision-m65	Remove

Application Hosting Entry

Service: AIM Talk

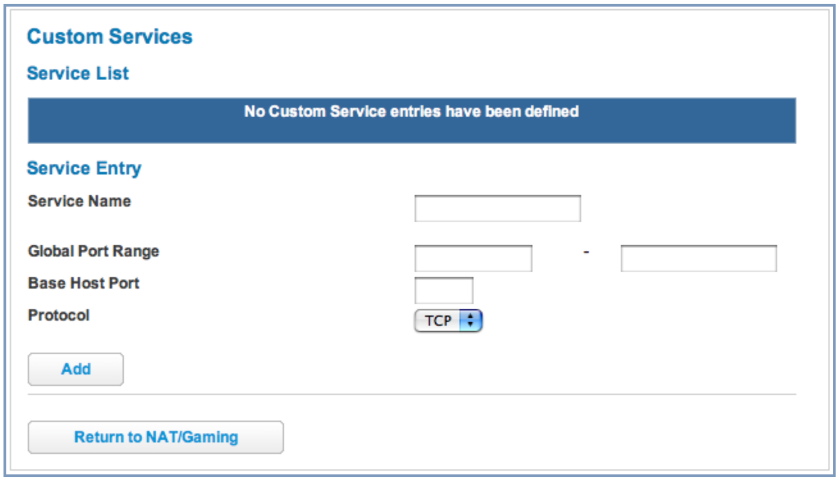
Needed by Device: unknown000d934a4116

Custom Services

To remove a game or software from the hosted list, choose the game or software you want to remove and click the **Remove** button.

Custom Services

To configure a Custom Service, click the **Add/Edit Services** button. The **Custom Services** page appears.



Custom Services

Service List

No Custom Service entries have been defined

Service Entry

Service Name	
Global Port Range	-
Base Host Port	
Protocol	TCP

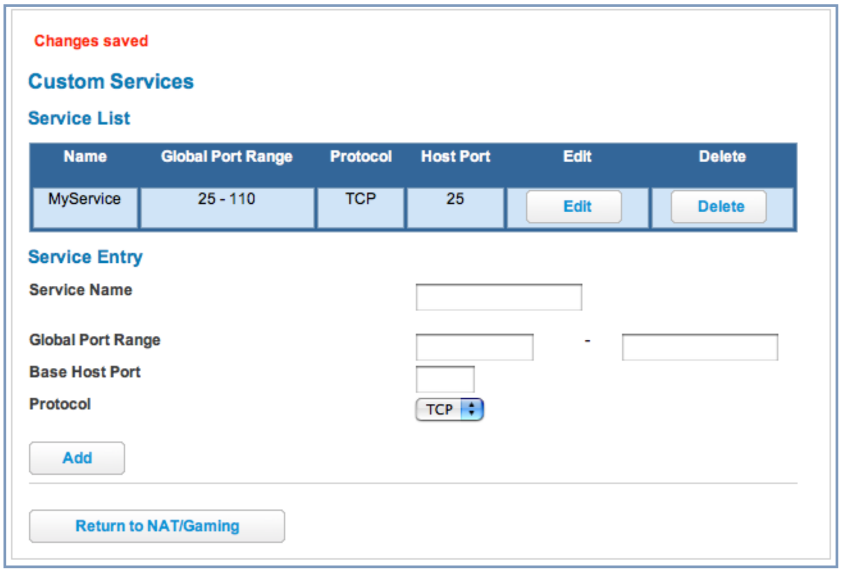
Enter the following information:

- **Service Name:** A unique identifier for the Custom Service.
- **Global Port Range:** Range of ports on which incoming traffic will be received.
- **Base Host Port:** The port number at the start of the port range your Gateway should use when forwarding traffic of the specified type(s) to the internal IP address.
- **Protocol:** Protocol type of Internet traffic, TCP or UDP.

Once you define a Custom Service it becomes available in the **Application Hosting Entry Service** menu as one of the services to select.

Click the **Add** button.

Each time you enable a custom service your entry will be added to the list of **Service** names displayed on the Custom Services page.



Changes saved

Custom Services

Service List

Name	Global Port Range	Protocol	Host Port	Edit	Delete
MyService	25 - 110	TCP	25	Edit	Delete

Service Entry

Service Name	
Global Port Range	-
Base Host Port	
Protocol	TCP

Changes are saved immediately.

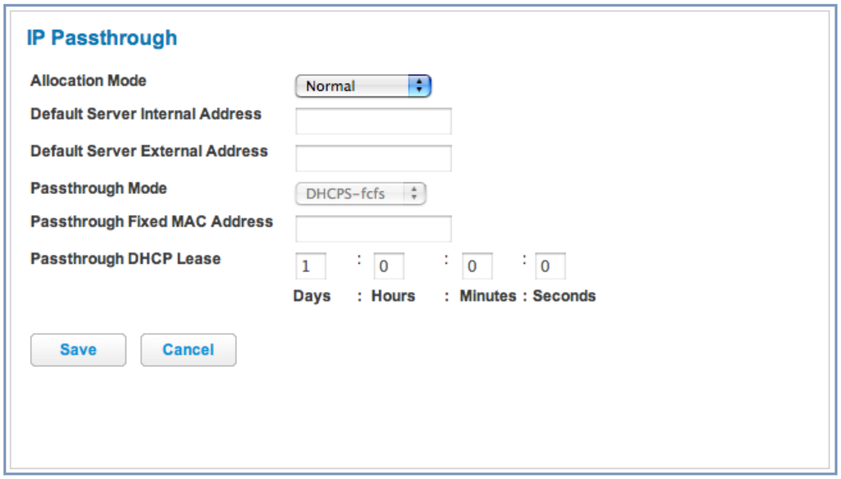
List of Supported Games and Software

AIM Talk	Act of War - Direct Action	Age of Empires II
Age of Empires, v.1.0	Age of Empires: The Rise of Rome, v.1.0	Age of Mythology
Age of Wonders	America's Army	Apache
Asheron's Call	Azureus	Baldur's Gate I and II
Battlefield 1942	Battlefield Communicator	Battlefield Vietnam
BitTornado	BitTorrent	Black and White
Blazing Angels Online	Brothers in Arms - Earned in Blood	Brothers in Arms Online
Buddy Phone	CART Precision Racing, v 1.0	Calista IP Phone
Call of Duty	Citrix Metaframe/ICA Client	Close Combat III: The Russian Front, v 1.0
Close Combat for Windows 1.0	Close Combat: A Bridge Too Far, v 2.0	Combat Flight Sim 2: WWII Pacific Thr, v 1.0
Combat Flight Sim: WWII Europe Series, v 1.0	Counter Strike	DNS Server
Dark Reign	Delta Force (Client and Server)	Delta Force 2
Delta Force Black Hawk Down	Diablo II Server	Dialpad
DirecTV STB 1	DirecTV STB 2	DirecTV STB 3
Doom 3	Dues Ex	Dune 2000
Empire Earth	Empire Earth 2	F-16, Mig 29
F-22, Lightning 3	FTP	Far Cry
Fighter Ace II	GNUtella	Grand Theft Auto 2 Multiplayer
H.323 compliant (Netmeeting, CUSeeME)	HTTP	HTTPS
Half Life	Half Life 2 Steam	Half Life 2 Steam Server
Half Life Steam	Half Life Steam Server	Halo
Hellbender for Windows, v 1.0	Heretic II	Hexen II
Hotline Server	ICQ 2001b	ICQ Old
IMAP Client	IMAP Client v.3	IPSec IKE
Internet Phone	Jedi Knight II: Jedi Outcast	Kali
KazaA	Lime Wire	Links LS 2000
Lord of the Rings Online	MSN Game Zone	MSN Game Zone DX
MSN Messenger	Mech Warrior 3	MechWarrior 4: Vengeance
Medal of Honor Allied Assault	Microsoft Flight Simulator 2000	Microsoft Flight Simulator 98

Microsoft Golf 1998 Edition, v 1.0	Microsoft Golf 1999 Edition	Microsoft Golf 2001 Edition
Midtown Madness, v 1.0	Monster Truck Madness 2, v 2.0	Monster Truck Madness, v 1.0
Motocross Madness 2, v 2.0	Motocross Madness, v 1.0	NNTP
Need for Speed 3, Hot Pursuit	Need for Speed, Porsche	Net2Phone
Operation FlashPoint	Outlaws	POP-3
PPTP	PlayStation Network	Quake 2
Quake 3	Quake 4	Rainbow Six
RealAudio	Return to Castle Wolfenstein	Roger Wilco
Rogue Spear	SMTP	SNMP
SSH server	ShoutCast Server	SlingBox
Soldier of Fortune	StarCraft	StarLancer, v 1.0
Starfleet Command	TFTP	TeamSpeak
Telnet	Tiberian Sun: Command and Conquer	Timbuktu
Total Annihilation	Ultima Online	Unreal Tournament Server
Urban Assault, v 1.0	VNC, Virtual Network Computing	Warlords Battlecry
Warrock	Westwood Online, Command and Conquer	Win2000 Terminal Server
Wolfenstein Enemy Territory	World of Warcraft	X-Lite
XBox 360 Media Center	XBox Live 360	Yahoo Messenger Chat
Yahoo Messenger Phone	ZNES	eDonkey
eMule	eMule Plus	iTunes
mIRC Auth-IdentD	mIRC Chat	mIRC DCC - IRC DCC
pcAnywhere (incoming)		

Link: IP Passthrough

When you click the **IP Passthrough** button, the **IP Passthrough** page appears.



IP Passthrough

Allocation Mode: Normal

Default Server Internal Address:

Default Server External Address:

Passthrough Mode: DHCPS-fcfs

Passthrough Fixed MAC Address:

Passthrough DHCP Lease: 1 : 0 : 0 : 0

Days : Hours : Minutes : Seconds

IP Passthrough

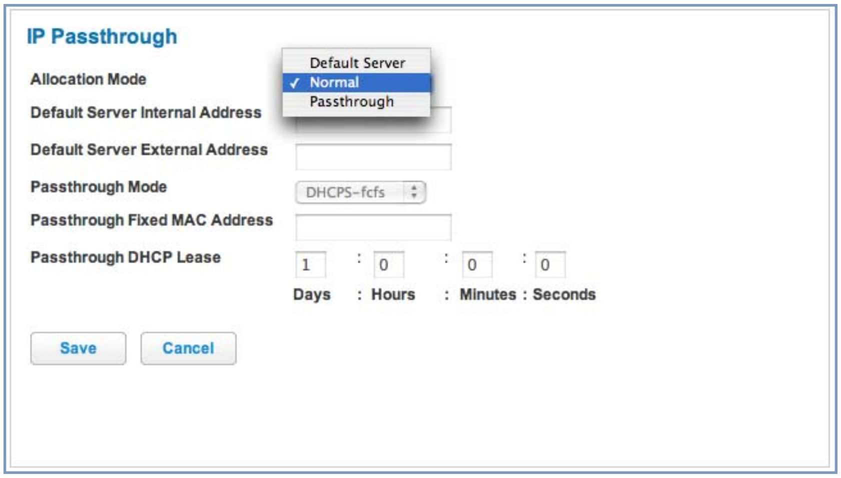
The IP Passthrough feature allows a single PC on the LAN to have the Router's public address assigned to it. It also provides PAT (NAPT) via the same public IP address for all other hosts on the private LAN subnet. Using IP Passthrough:

- The public WAN IP is used to provide IP address translation for private LAN computers.
- The public WAN IP is assigned and reused on a LAN computer.
- DHCP address serving can automatically serve the WAN IP address to a LAN computer.

  When DHCP is used for addressing the designated passthrough PC, the acquired or configured WAN address is passed to DHCP, which will dynamically configure a single-servable-address subnet, and reserve the address for the configured PC's MAC address. This dynamic subnet configuration is based on the local and remote WAN address and subnet mask. If the WAN interface does not have a suitable subnet mask that is usable, for example when using PPP or PPPoE, the DHCP subnet configuration will default to a class C subnet mask.
- The Passthrough DHCP Lease – By default, the passthrough host's DHCP leases will be shortened to two minutes. This allows for timely updates of the host's IP address, which will be a private IP address before the WAN connection is established. After the WAN connection is established and has an address, the passthrough host can renew its DHCP address binding to acquire the WAN IP address. You may alter this setting.
- Click **Save**. Changes take effect immediately.

A restriction

Since both the Router and the passthrough host will use the same IP address, new sessions that conflict with existing sessions will be rejected by the Router. For example, suppose you are a teleworker using an IPSec tunnel from the Router and from the passthrough host. Both tunnels go to the same remote endpoint, such as the VPN access concentrator at your employer's office. In this case, the first one to start the IPSec traffic will be allowed; the second one – since, from the WAN, it's indistinguishable – will fail.



IP Passthrough

Allocation Mode: Default Server / ✓ Normal / Passthrough

Default Server Internal Address

Default Server External Address

Passthrough Mode: DHCPS-fcfs

Passthrough Fixed MAC Address

Passthrough DHCP Lease: 1 : 0 : 0 : 0 (Days : Hours : Minutes : Seconds)

NAT Default Server

This feature allows you to:

- Direct your Gateway to forward all externally initiated IP traffic (TCP and UDP protocols only) to a default host on the LAN, specified by your entry in the **Internal Address** field.
- Enable it for certain situations:
  – Where you cannot anticipate what port number or packet protocol an in-bound application might use. For example, some network games select arbitrary port numbers when a connection is opened.
  – When you want all unsolicited traffic to go to a specific LAN host.

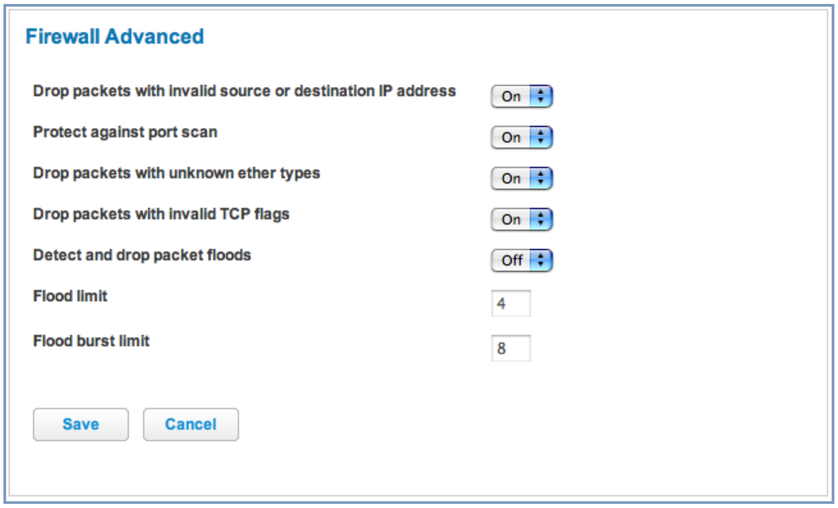
This feature allows you to direct unsolicited or non-specific traffic to a designated LAN station. With NAT “On” in the Gateway, these packets normally would be discarded.

For instance, this could be application traffic where you don’t know (in advance) the port or protocol that will be used. Some game applications fit this profile.

- Click Save. Changes take effect immediately.

Link: Firewall Advanced

When you click the **Firewall Advanced** button the **Firewall Advanced** screen appears.



Firewall Advanced

Drop packets with invalid source or destination IP address	On
Protect against port scan	On
Drop packets with unknown ether types	On
Drop packets with invalid TCP flags	On
Detect and drop packet floods	Off
Flood limit	4
Flood burst limit	8

All computer operating systems are vulnerable to attack from outside sources, typically at the operating system or Internet Protocol (IP) layers. Stateful Inspection firewalls intercept and analyze incoming data packets to determine whether they should be admitted to your private LAN, based on multiple criteria, or blocked. Stateful inspection improves security by tracking data packets over a period of time, examining incoming and outgoing packets. Outgoing packets that request specific types of incoming packets are tracked; only those incoming packets constituting a proper response are allowed through the firewall.

Stateful inspection is a security feature that prevents unsolicited inbound access when NAT is disabled. You can configure UDP and TCP “no-activity” periods that will also apply to NAT time-outs if stateful inspection is enabled on the interface. Stateful Inspection parameters are active on a WAN interface only if enabled on your Gateway. Stateful inspection can be enabled on a WAN interface whether NAT is enabled or not.

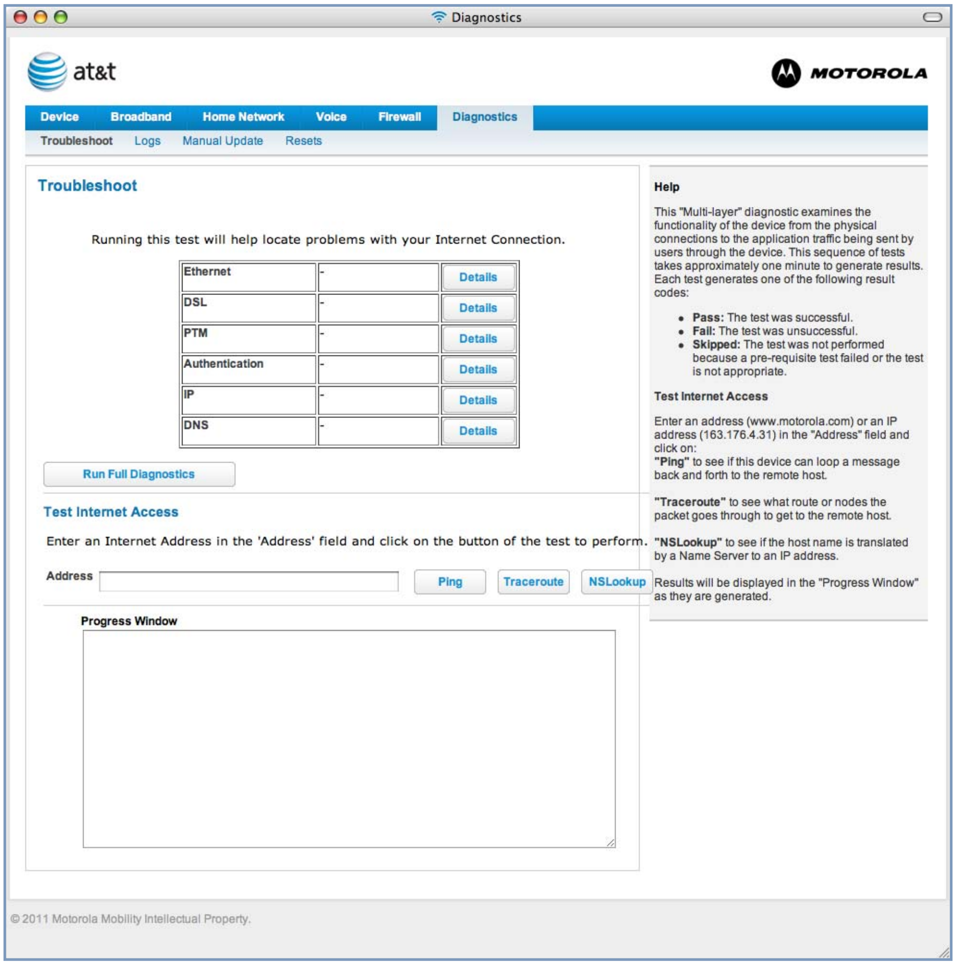
DoS Protection – Denial-**0**f-**S**ervice attacks are common on the Internet, and can render an individual PC or a whole network practically unusable by consuming all its resources. Your Gateway includes default settings to block the most common types of DoS attacks. For special requirements or circumstances, a variety of additional blocking characteristics is offered. See the following table.

Menu item	Function
Drop packets with invalid source or destination IP address	Whether packets with invalid source or destination IP address(es) are to be dropped
Protect against port scan	Whether to detect and drop port scans.
Drop packets with unknown ether types	Whether packets with unknown ether types are to be dropped
Drop packets with invalid TCP flags	Whether packets with invalid TCP flag settings (NULL, FIN, Xmas, etc.) should be dropped
Detect and drop packet floods	Whether packet flooding should be detected and offending packets be dropped
Flood limit (packets per second)	Specifies the number limit of packets per second before dropping the remainder.
Flood burst limit (maximum number of packets in a burst)	Specifies the number limit of packets in a single burst before dropping the remainder.

If you make any changes here, click the **Save** button.

Diagnostics

When you click the **Diagnostics** tab, the **Troubleshoot** page appears.



Troubleshoot

Running this test will help locate problems with your Internet Connection.

Ethernet	-	Details
DSL	-	Details
PTM	-	Details
Authentication	-	Details
IP	-	Details
DNS	-	Details

Test Internet Access

Enter an Internet Address in the 'Address' field and click on the button of the test to perform.

Help

This "Multi-layer" diagnostic examines the functionality of the device from the physical connections to the application traffic being sent by users through the device. This sequence of tests takes approximately one minute to generate results. Each test generates one of the following result codes:

- **Pass:** The test was successful.
- **Fail:** The test was unsuccessful.
- **Skipped:** The test was not performed because a pre-requisite test failed or the test is not appropriate.

Test Internet Access

Enter an address (www.motorola.com) or an IP address (163.176.4.31) in the "Address" field and click on:
"Ping" to see if this device can loop a message back and forth to the remote host.

"Traceroute" to see what route or nodes the packet goes through to get to the remote host.

"NSLookup" to see if the host name is translated by a Name Server to an IP address.

Results will be displayed in the "Progress Window" as they are generated.

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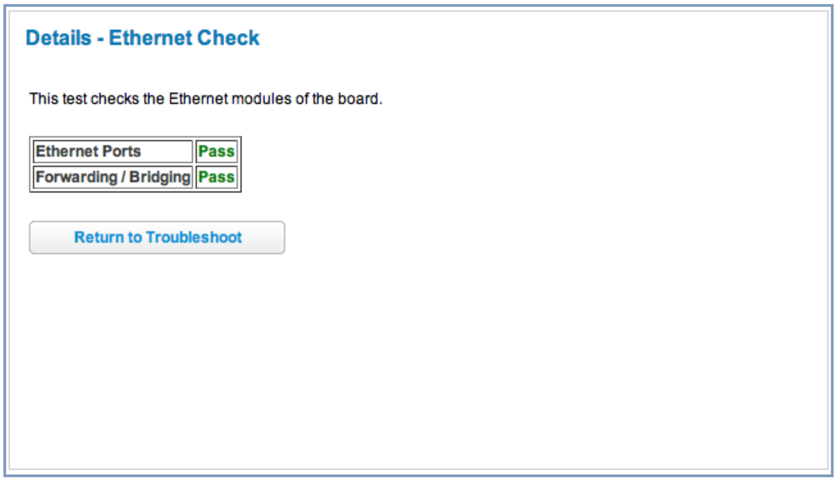
This automated multi-layer test examines the functionality of the Router from the physical connections to the data traffic being sent by users through the Router.

You can run all the tests in order by clicking the **Run Full Diagnostics** button.

The modem will automatically test a number of components to determine any problems. You can see detailed results of the tests by clicking the **Details** buttons for each item.

Here is an example of the Ethernet Details screen.



Details - Ethernet Check

This test checks the Ethernet modules of the board.

Ethernet Ports	Pass
Forwarding / Bridging	Pass

Test Internet Access

These tests send a PING from the modem to either the LAN or WAN to verify connectivity. A PING could be either an IP address (163.176.4.32) or Domain Name (www.motorola.com). You enter a web address URL or an IP address in the respective field and Select your **Preferred protocol** radio button, **IPv4** or **IPv6**.

Click the **Ping**, **Trace**, or **Lookup** button.

Results will be displayed in the **Progress Window** as they are generated.

- **Ping** - tests the "reachability" of a particular network destination by sending an ICMP echo request and waiting for a reply.
- **Traceroute** - displays the path to a destination by showing the number of hops and the router addresses of these hops.
- **NSLookup** - converts a domain name to its IP address and vice versa.

To use the Ping capability, type a destination address (domain name or IP address) in the text box and click the **Ping**, **Trace**, or **Lookup** button. The results are displayed in the **Progress Window**.

This sequence of tests takes approximately one minute to generate results. Please wait for the test to run to completion.

Each test generates one of the following result codes:

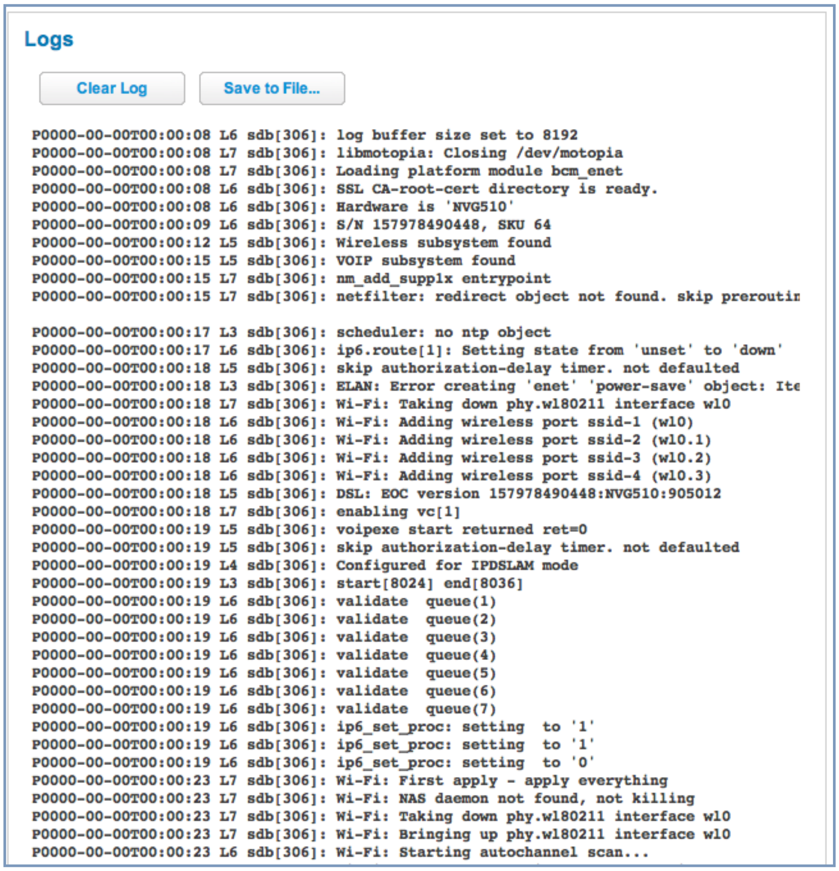
Result	Meaning
* PASS:	The test was successful.
* FAIL:	The test was unsuccessful.
* SKIPPED:	The test was skipped because a test on which it depended failed.
* PENDING:	The test timed out without producing a result. Try running the test again.
* WARNING:	The test was unsuccessful. The Service Provider equipment your Modem connects to may not support this test.

Below are some specific tests:

Action	If PING fails, possible causes are:
From the Check Connection page:	
Ping the internet default gateway IP address	DSL is down, DSL or ATM settings are incorrect; Gateway’s IP address or subnet mask are wrong; gateway router is down.
Ping an internet site by IP address	Site is down.
Ping an internet site by name	Servers are down; site is down.
From a LAN PC:	
Ping the Modem’s LAN IP address	IP address and subnet mask of PC are not on the same scheme as the Modem; cabling or other connectivity issue.
Ping an internet site by IP address	PC's subnet mask may be incorrect, site is down.
Ping an internet site by name	DNS is not properly configured on the PC, site is down.

Link: Logs

When you click **Logs**, the Logs page appears.



```
P0000-00-00T00:00:08 L6 sdb[306]: log buffer size set to 8192
P0000-00-00T00:00:08 L7 sdb[306]: libmotopia: Closing /dev/motopia
P0000-00-00T00:00:08 L7 sdb[306]: Loading platform module bcm_enet
P0000-00-00T00:00:08 L6 sdb[306]: SSL CA-root-cert directory is ready.
P0000-00-00T00:00:08 L6 sdb[306]: Hardware is 'NVG510'
P0000-00-00T00:00:09 L6 sdb[306]: S/N 157978490448, SKU 64
P0000-00-00T00:00:12 L5 sdb[306]: Wireless subsystem found
P0000-00-00T00:00:15 L5 sdb[306]: VOIP subsystem found
P0000-00-00T00:00:15 L7 sdb[306]: nm_add_supplx entrypoint
P0000-00-00T00:00:15 L7 sdb[306]: netfilter: redirect object not found. skip preroutin

P0000-00-00T00:00:17 L3 sdb[306]: scheduler: no ntp object
P0000-00-00T00:00:17 L6 sdb[306]: ip6.route[1]: Setting state from 'unset' to 'down'
P0000-00-00T00:00:18 L5 sdb[306]: skip authorization-delay timer. not defaulted
P0000-00-00T00:00:18 L3 sdb[306]: ELAN: Error creating 'enet' 'power-save' object: Ite
P0000-00-00T00:00:18 L7 sdb[306]: Wi-Fi: Taking down phy.wl80211 interface wl0
P0000-00-00T00:00:18 L6 sdb[306]: Wi-Fi: Adding wireless port ssid-1 (wl0)
P0000-00-00T00:00:18 L6 sdb[306]: Wi-Fi: Adding wireless port ssid-2 (wl0.1)
P0000-00-00T00:00:18 L6 sdb[306]: Wi-Fi: Adding wireless port ssid-3 (wl0.2)
P0000-00-00T00:00:18 L6 sdb[306]: Wi-Fi: Adding wireless port ssid-4 (wl0.3)
P0000-00-00T00:00:18 L5 sdb[306]: DSL: EOC version 157978490448:NVG510:905012
P0000-00-00T00:00:18 L7 sdb[306]: enabling vc[1]
P0000-00-00T00:00:19 L5 sdb[306]: voipexe start returned ret=0
P0000-00-00T00:00:19 L5 sdb[306]: skip authorization-delay timer. not defaulted
P0000-00-00T00:00:19 L4 sdb[306]: Configured for IPDSLAM mode
P0000-00-00T00:00:19 L3 sdb[306]: start[8024] end[8036]
P0000-00-00T00:00:19 L6 sdb[306]: validate  queue(1)
P0000-00-00T00:00:19 L6 sdb[306]: validate  queue(2)
P0000-00-00T00:00:19 L6 sdb[306]: validate  queue(3)
P0000-00-00T00:00:19 L6 sdb[306]: validate  queue(4)
P0000-00-00T00:00:19 L6 sdb[306]: validate  queue(5)
P0000-00-00T00:00:19 L6 sdb[306]: validate  queue(6)
P0000-00-00T00:00:19 L6 sdb[306]: validate  queue(7)
P0000-00-00T00:00:19 L6 sdb[306]: ip6_set_proc: setting  to '1'
P0000-00-00T00:00:19 L6 sdb[306]: ip6_set_proc: setting  to '1'
P0000-00-00T00:00:19 L6 sdb[306]: ip6_set_proc: setting  to '0'
P0000-00-00T00:00:23 L7 sdb[306]: Wi-Fi: First apply - apply everything
P0000-00-00T00:00:23 L7 sdb[306]: Wi-Fi: NAS daemon not found, not killing
P0000-00-00T00:00:23 L7 sdb[306]: Wi-Fi: Taking down phy.wl80211 interface wl0
P0000-00-00T00:00:23 L7 sdb[306]: Wi-Fi: Bringing up phy.wl80211 interface wl0
P0000-00-00T00:00:23 L6 sdb[306]: Wi-Fi: Starting autochannel scan...
```

The current status of the Router is displayed for all logs.

- You can clear all log entries by clicking the **Clear Log** button.
- You can save logs to a text (.TXT) file by clicking the **Save to File** button. This will download the file to your browser's default download location on your hard drive. The file can be opened with your favorite text editor.

Note:

Some browsers, such as Internet Explorer for Windows XP, require that you specify the Motorola® Gateway's URL as a "Trusted site" in "Internet Options: Security". This is necessary to allow the "download" of the log text file to the PC.

The following is an example log portion saved as a .TXT file:

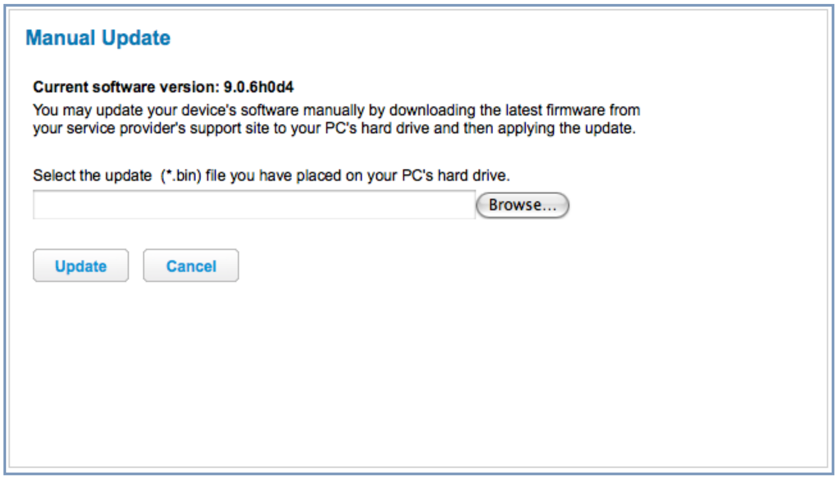
```
P0000-00-00T00:00:08 L6 sdb[306]: log buffer size set to 8192
P0000-00-00T00:00:08 L7 sdb[306]: libmotopia: Closing /dev/motopia
P0000-00-00T00:00:08 L7 sdb[306]: Loading platform module bcm_enet
P0000-00-00T00:00:08 L6 sdb[306]: SSL CA-root-cert directory is ready.
P0000-00-00T00:00:08 L6 sdb[306]: Hardware is 'NVG510'
P0000-00-00T00:00:09 L6 sdb[306]: S/N 157978490448, SKU 64
P0000-00-00T00:00:12 L5 sdb[306]: Wireless subsystem found
P0000-00-00T00:00:15 L5 sdb[306]: VOIP subsystem found
P0000-00-00T00:00:15 L7 sdb[306]: nm_add_supp1x entrypoint
P0000-00-00T00:00:15 L7 sdb[306]: netfilter: redirect object not found. skip prerouting rules

P0000-00-00T00:00:17 L3 sdb[306]: scheduler: no ntp object
P0000-00-00T00:00:17 L6 sdb[306]: ip6.route[1]: Setting state from 'unset' to 'down'
P0000-00-00T00:00:18 L5 sdb[306]: skip authorization-delay timer. not defaulted
P0000-00-00T00:00:18 L3 sdb[306]: ELAN: Error creating 'enet' 'power-save' object: Item not
found
P0000-00-00T00:00:18 L7 sdb[306]: Wi-Fi: Taking down phy.wl80211 interface wl0
P0000-00-00T00:00:18 L6 sdb[306]: Wi-Fi: Adding wireless port ssid-1 (wl0)
P0000-00-00T00:00:18 L6 sdb[306]: Wi-Fi: Adding wireless port ssid-2 (wl0.1)
P0000-00-00T00:00:18 L6 sdb[306]: Wi-Fi: Adding wireless port ssid-3 (wl0.2)
P0000-00-00T00:00:18 L6 sdb[306]: Wi-Fi: Adding wireless port ssid-4 (wl0.3)
P0000-00-00T00:00:18 L5 sdb[306]: DSL: EOC version 157978490448:NVG510:905012
P0000-00-00T00:00:18 L7 sdb[306]: enabling vc[1]
P0000-00-00T00:00:19 L5 sdb[306]: voipexe start returned ret=0
P0000-00-00T00:00:19 L5 sdb[306]: skip authorization-delay timer. not defaulted
P0000-00-00T00:00:19 L4 sdb[306]: Configured for IPDSLAM mode
P0000-00-00T00:00:19 L3 sdb[306]: start[8024] end[8036]
P0000-00-00T00:00:19 L6 sdb[306]: validate <basic> queue(1)
P0000-00-00T00:00:19 L6 sdb[306]: validate <basic> queue(2)
P0000-00-00T00:00:19 L6 sdb[306]: validate <basic> queue(3)
P0000-00-00T00:00:19 L6 sdb[306]: validate <basic> queue(4)
P0000-00-00T00:00:19 L6 sdb[306]: validate <basic> queue(5)
P0000-00-00T00:00:19 L6 sdb[306]: validate <basic> queue(6)
P0000-00-00T00:00:19 L6 sdb[306]: validate <priority> queue(7)
P0000-00-00T00:00:19 L6 sdb[306]: ip6_set_proc: setting </proc/sys/net/ipv6/conf/all/
disable_ipv6> to '1'
P0000-00-00T00:00:19 L6 sdb[306]: ip6_set_proc: setting </proc/sys/net/ipv6/conf/default/
disable_ipv6> to '1'
P0000-00-00T00:00:19 L6 sdb[306]: ip6_set_proc: setting </proc/sys/net/ipv6/conf/all/
forwarding> to '0'
P0000-00-00T00:00:23 L7 sdb[306]: Wi-Fi: First apply - apply everything
P0000-00-00T00:00:23 L7 sdb[306]: Wi-Fi: NAS daemon not found, not killing
P0000-00-00T00:00:23 L7 sdb[306]: Wi-Fi: Taking down phy.wl80211 interface wl0
P0000-00-00T00:00:23 L7 sdb[306]: Wi-Fi: Bringing up phy.wl80211 interface wl0
P0000-00-00T00:00:23 L6 sdb[306]: Wi-Fi: Starting autochannel scan...
P0000-00-00T00:00:24 L7 sdb[306]: Wi-Fi: SIOCDEVPRIVATE ioctl cmd=215 failed: Bad Argument
P0000-00-00T00:00:26 L6 sdb[306]: Wi-Fi: Autochannel found channel 11019
P0000-00-00T00:00:26 L7 sdb[306]: Wi-Fi: Taking down phy.wl80211 interface wl0
P0000-00-00T00:00:26 L7 sdb[306]: Wi-Fi: Bringing up phy.wl80211 interface wl0
P0000-00-00T00:00:26 L7 sdb[306]: Wi-Fi: Setting kernel ip link wl0 to up
P0000-00-00T00:00:26 L7 sdb[306]: Wi-Fi: Setting kernel ip link wl0.1 to down
P0000-00-00T00:00:26 L7 sdb[306]: Wi-Fi: Setting kernel ip link wl0.2 to down
P0000-00-00T00:00:26 L7 sdb[306]: Wi-Fi: Setting kernel ip link wl0.3 to down
P0000-00-00T00:00:26 L6 sdb[306]: Wi-Fi: EAPD daemon started (pid: 1030)
P0000-00-00T00:00:26 L6 sdb[306]: Wi-Fi: NAS daemon started, bringing up phy.wl80211.ssid[1]
P0000-00-00T00:00:26 L7 sdb[306]: Port ssid-1 sending UP event
P0000-00-00T00:00:26 L6 sdb[306]: DSL: Vectoring function is not supported.
P0000-00-00T00:00:26 L6 sdb[306]: DSL: Warning: PTM only.
P0000-00-00T00:00:27 L6 sdb[306]: DSL: set the NLNM Threshold value
...
```

Link: Manual Update

When you click **Manual Update**, the Manual Update page appears.

Operating System Software is what makes your Gateway run and occasionally it needs to be updated. Your **Current version** is displayed at the top of the page.



Manual Update

Current software version: 9.0.6h0d4

You may update your device's software manually by downloading the latest firmware from your service provider's support site to your PC's hard drive and then applying the update.

Select the update (*.bin) file you have placed on your PC's hard drive.

To update your software from a file on your PC, you must first download the software from your Service Provider's Support Site to your PC's hard drive.

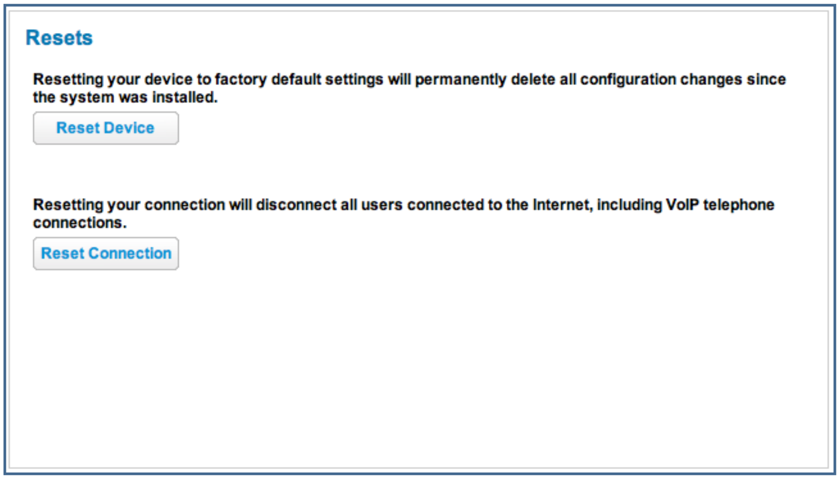
- **Browse** your computer for the operating system file you downloaded.
- Click the **Update** button.
- The installation may take a few minutes; wait for it to complete. You will be prompted to restart the Gateway.
- Restart your Gateway. A counter will countdown 3 times before returning you to home. Your new operating system will then be running.

Link: Resets

In some cases, you may need to clear all the configuration settings and start over again to program the Motorola® Gateway. You can perform a factory reset to do this.

It might also be useful to reset your connection to the Internet without deleting all of your configuration settings.

- Click the **Reset Device** button to reset the Gateway back to its original factory default settings. You will be prompted to make sure you want to do this.
- Click the **Reset Connection** button to disconnect and reconnect all of your connections, including your VoIP phones.



Resets

Resetting your device to factory default settings will permanently delete all configuration changes since the system was installed.

Resetting your connection will disconnect all users connected to the Internet, including VoIP telephone connections.

NOTE:

Exercise caution before performing a Factory Reset. This will erase any configuration changes that you may have made and allow you to reprogram your Gateway.

CHAPTER 3 Basic Troubleshooting

This section gives some simple suggestions for troubleshooting problems with your Gateway's initial configuration.

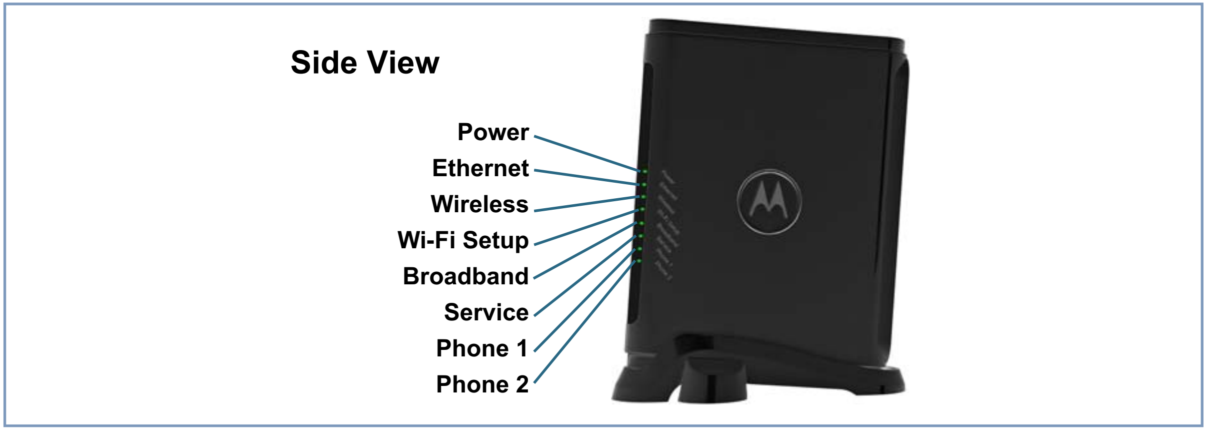
Before troubleshooting, make sure you have

- read the User Manual;
- plugged in all the necessary cables; and
- set your PC's TCP/IP controls to obtain an IP address automatically.

Status Indicator Lights

The first step in troubleshooting is to check the status indicator lights (LEDs) in the order outlined below.

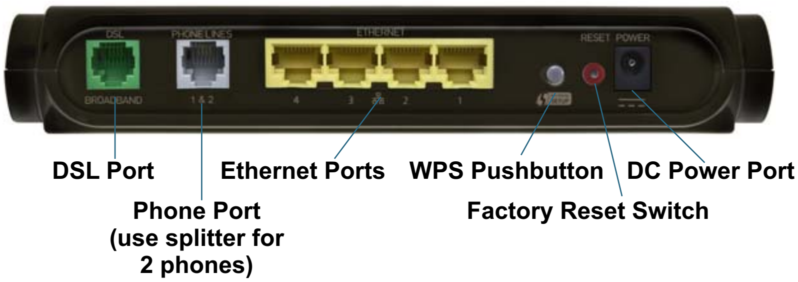
Motorola® Gateway NVG510 status indicator lights



LED	Action
Power	Solid Green = The device is powered. Flashing Green = A Power-On Self-Test (POST) is in progress Flashing Red = A POST failure (not bootable) or device malfunction occurred. * When the device encounters a POST failure, all indicator lights on the front of the device continuously flash. Off = The unit has no AC power.
Ethernet	Solid Green = Powered device connected to the associated port (includes devices with wake-on-LAN capability where a slight voltage is supplied to the Ethernet connection). Flickering Green = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic. Off = The device is not powered, no cable or no powered devices connected to the associated ports.
Wireless	Solid Green = WIFI is powered. Flickering Green = Activity seen from devices connected via WIFI. The flickering of the light is synchronized to actual data traffic. Off = The device is not powered or no powered devices connected to the associated ports.
Wi-Fi Setup	Flickering Green = Indicates when WPS is broadcasting. Off = not in use, not broadcasting.
Broadband	Solid Green = Good broadband connection (i.e., good DSL Sync). Flashing Green = Attempting broadband connection (i.e., DSL attempting sync). Flashing Green & Red = If the broadband connection fails to be established for more than three consecutive minutes the LED switches to Flashing Green when attempting or waiting to establish a broadband connection alternating with a five second steady Red. This pattern continues until the broadband connection is successfully established. Flashing Red = No DSL signal on the line. This is only used when there is no signal, not during times of temporary 'no tone' during the training sequence. Off = The device is not powered.

LED	Action
Service	Solid Green = IP connected (The device has a WAN IP address from DHCP or 802.1x authentication and the broadband connection is up). Flashing Green = Attempting PPP connection. Attempting IEEE 802.1X authentication or attempting to obtain DHCP information. Red = Device attempted to become IP connected and failed (no DHCP response, no PPPoE response, 802.1x authentication failed, no IP address from IPCP, etc.). The Red state times out after two minutes and the Service indicator light returns to the Off state. Off = The device is not powered or the broadband connection is not present.
Phone 1, 2	Solid Green = The associated VoIP line has been registered with a SIP proxy server. Flashing Green = Indicates a telephone is off-hook on the associated VoIP line. Off = VoIP not in use, line not registered or Gateway power off.

Motorola® Gateway NVG510 Rear View



LED Function Summary Matrix

Power	**Solid Green** = The device is powered.	**Flashing Green** = A Power-On Self-Test (POST) is in progress		**Flashing Red** = A POST failure (not bootable) or device malfunction occurred. * When the device encounters a POST failure, all indicator lights on the front of the device continuously flash.	**Off** = The unit has no AC power.
Ethernet	**Solid Green** = Powered device connected to the associated port (includes devices with wake-on-LAN capability where a slight voltage is supplied to the Ethernet connection).	**Flashing Green** = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic.			**Off** = The device is not powered, no cable or no powered devices connected to the associated ports.
Wireless	**Solid Green** = WIFI is powered.	**Flashing Green** = Activity seen from devices connected via WIFI. The flickering of the light is synchronized to actual data traffic.			**Off** = The device is not powered or no powered devices connected to the associated ports.
Phone 1, 2	**Solid Green** = The associated VoIP line has been registered with a SIP proxy server.	**Flashing Green** = Indicates a telephone is off-hook on the associated VoIP line.			**Off** = VoIP not in use, line not registered or Gateway power off.
WPS		**Flashing Green** = Indicates when WPS is broadcasting.			**Off** = not in use, not broadcasting.

Broadband	**Solid Green** = Good broadband connection (i.e., good DSL Sync).	**Flashing Green** = Attempting broadband connection (i.e., DSL attempting sync).	**Flashing Green** & **Red** = If the broadband connection fails to be established for more than three consecutive minutes the LED switches to **Flashing Green** when attempting or waiting to establish a broadband connection alternating with a five second steady **Red**. This pattern continues until the broadband connection is successfully established.	**Flashing Red** = No DSL signal on the line. This is only used when there is no signal, not during times of temporary 'no tone' during the training sequence.	**Off** = The device is not powered.
Service	**Solid Green** = IP connected (The device has a WAN IP address from DHCP or 802.1x authentication and the broadband connection is up).	**Flashing Green** = Attempting PPP connection. Attempting IEEE 802.1X authentication or attempting to obtain DHCP information.		**Red** = Device attempted to become IP connected and failed (no DHCP response, no PPPoE response, 802.1x authentication failed, no IP address from IPCP, etc.). The Red state times out after two minutes and the Service indicator light returns to the Off state.	**Off** = The device is not powered or the broadband connection is not present.

If a status indicator light does not look correct, look for these possible problems:

If LED is not Lit	Possible problems
Power	◆ Make sure the power adapter is plugged into the DSL Modem properly. ◆ Try a known good wall outlet. ◆ If a power strip is used, make sure it is switched on.
Broadband	◆ Make sure that any telephone has a microfilter installed. ◆ Make sure that you are using the correct cable. The DSL cable is the thinner standard telephone cable and labeled "Data Cable." ◆ Make sure the DSL cable is plugged into the correct wall jack. ◆ Make sure the DSL cable is plugged into the DSL port on the DSL Modem. ◆ Make sure the DSL line has been activated at the central office DSLAM. ◆ Make sure the DSL Modem is not plugged into a micro filter.
Ethernet	◆ Make sure the you are using the yellow Ethernet cable, not the DSL cable. The Ethernet cable is thicker than the standard telephone cable. ◆ Make sure the Ethernet cable is securely plugged into the Ethernet jack on the PC. ◆ Make sure the Ethernet cable is securely plugged into the Ethernet port on the DSL Modem. ◆ Make sure you have Ethernet drivers installed on the PC. ◆ Make sure the PC's TCP/IP Properties for the Ethernet Network Control Panel is set to obtain an IP address via DHCP. ◆ Make sure the PC has obtained an address in the 192.168.1.x range. (You may have changed the subnet addressing.) ◆ Make sure the PC is configured to access the Internet over a LAN. ◆ Disable any installed network devices (Ethernet, HomePNA, wireless) that are not being used to connect to the DSL Modem.

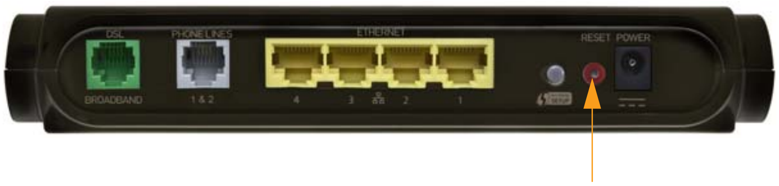
Factory Reset Switch

Lose your Access Code? This section shows how to reset the Motorola® Gateway so that you can access the configuration screens once again.

NOTE: Keep in mind that all of your settings will need to be reconfigured.

If you don't have an Access Code, the only way to access the Motorola® Gateway is the following:

1. **Referring to the diagram below, find the round Reset Switch opening.**



Factory Reset Switch: Push to clear all settings

2. **Carefully insert the point of a pen or an unwound paperclip into the opening.**

- If you press the factory reset button for **less than ten (10) seconds**, the device will be rebooted.

  The indicator lights on the device will respond immediately and start blinking red within one (1) second of the reset button being pressed.

  This will occur independent of the fact that the button is still being pressed or has been released. The indicator lights will flash for a minimum of five seconds, even if the reset button is released prior to five seconds after it has been depressed. If the reset button is held for more than 5 seconds, then it will continue to flash until released or until 10 seconds (see below).
- If you press the factory reset button for a **longer period of time**, the device will be reset to the factory default shipped settings.

  If the button is held for ten seconds, the Power indicator continues to flash, for an additional 5 seconds and then the indicator lights will return to their normal operating mode, independent of whether or not the reset button is still depressed.

CHAPTER 4 Command Line Interface

The Motorola Gateway operating software includes a command line interface (CLI) that lets you access your Motorola Gateway over a telnet connection. You can use the command line interface to enter and update the unit's configuration settings, monitor its performance, and restart it.

This chapter covers the following topics:

CONFIG Commands
"Connection commands" on page 95
"Filterset commands" on page 96
"Queue commands" on page 100
"IP Gateway commands" on page 101
"IPv6 Commands" on page 101
"IP DNS commands" on page 106
"IP IGMP commands" on page 107
"NTP commands" on page 109
"Application Layer Gateway (ALG) commands" on page 110
"Dynamic DNS Commands" on page 110
"Link commands" on page 111
"Management commands" on page 113
"Remote access commands" on page 115
"Physical interfaces commands" on page 117
"PPPoE relay commands" on page 120
"NAT Pinhole commands" on page 121
"Security Stateful Packet Inspection (SPI) commands" on page 121

CONFIG Commands
“VoIP commands” on page 122
“System commands” on page 130

Overview

The CLI has two major command modes: **SHELL** and **CONFIG**. **Summary tables** that list the commands are provided below. Details of the entire command set follow in this section.

SHELL Commands

Command	Status and/or Description
arp	to send ARP request
atmping	to send ATM OAM loopback
clear	to erase all stored configuration information
clear_certificate	to remove an SSL certificate that has been installed
clear_log	to erase all stored log info in flash memory
configure	to configure unit's options
diagnose	to run self-test
download	to download config file
exit	to quit this shell
help	to get more: “help all” or “help help”
install	to download and program an image into flash
log	to add a message to the diagnostic log
loglevel	to report or change diagnostic log level
netstat	to show IP information
nslookup	to send DNS query for host
ping	to send ICMP Echo request
quit	to quit this shell
reset	to reset subsystems
restart	to restart unit
show	to show system information
start	to start subsystem
status	to show basic status of unit
telnet	to telnet to a remote host
traceroute	to send traceroute probes
upload	to upload config file
view	to show configuration information
who	to show who is using the shell

CONFIG Commands	
Command Verbs	**Status and/or Description**
delete	Delete configuration list data
help	Help command option
save	Save configuration data
script	Print configuration data
set	Set configuration data
validate	Validate configuration settings
view	View configuration data
Keywords	
conn	Connection options
ip	TCP/IP protocol options
dns	Domain Name System options
igmp	IGMP configuration options
ntp	Network Time Protocol options
gateway	Gateway options
link	WAN link options
mgmt	System management options
phy	Physical interface options
dsl	DSL configuration options
enet	Ethernet options
pinhole	Pinhole options
system	Gateway's system options
log	System activity logging options
Command Utilities	
top	Go to top level of configuration mode
quit	Exit from configuration mode; return to shell mode
exit	Exit from configuration mode; return to shell mode

Starting and Ending a CLI Session

Open a telnet connection from a workstation on your network.

You initiate a telnet connection by issuing the following command from an IP host that supports telnet, for example, a personal computer running a telnet application such as NCSA Telnet.

```
telnet <ip_address>
```

You must know the IP address of the Motorola Gateway before you can make a telnet connection to it. By default, your Motorola Gateway uses 192.168.1.254 as the IP address for its LAN interface. You can use a Web browser to configure the Motorola Gateway IP address.

Logging In

The command line interface log-in process emulates the log-in process for a UNIX host. To logon, enter the username and your password.

Entering the administrator password lets you display and update all Motorola Gateway settings.

When you have logged in successfully, the command line interface lists the username and the security level associated with the password you entered in the diagnostic log.

Ending a CLI Session

You end a command line interface session by typing **`quit`** from the SHELL node of the command line interface hierarchy.

Using the CLI Help Facility

The **help** command lets you display on-line help for SHELL and CONFIG commands. To display a list of the commands available to you from your current location within the command line interface hierarchy, enter **`help`** or type a question mark (**`?`**).

To obtain help for a specific CLI command, type **`help <command>`**. You can truncate the ***help*** command to ***h*** or a question mark when you request help for a CLI command.

About SHELL Commands

You begin in SHELL mode when you start a CLI session. SHELL mode lets you perform the following tasks with your Motorola Gateway:

- Monitor its performance
- Display and reset Gateway statistics
- Issue administrative commands to restart Motorola Gateway functions

SHELL Prompt

When you are in SHELL mode, the CLI prompt is the name of the Motorola Gateway followed by a right angle bracket (>). For example, if you open a CLI connection to the Motorola Gateway named "Motorola-3000/9437188," you would see ***Motorola-3000/9437188>*** as your CLI prompt.

SHELL Command Shortcuts

You can **truncate** most commands in the CLI to their shortest unique string. For example, you can use the truncated command ***q*** in place of the full ***quit*** command to exit the CLI. However, you would need to enter ***rese*** for the ***reset*** command, since the first characters of ***reset*** are common to the ***restart*** command.

The only commands you cannot truncate are ***restart*** and ***clear***. To prevent accidental interruption of communications, you must enter the ***restart*** and ***clear*** commands in their entirety.

You can use the Up and Down arrow keys to scroll backward and forward through recent commands you have entered. Alternatively, you can use the ***!!*** command to repeat the last command you entered.

SHELL Commands

Common Commands

arp *nnn.nnn.nnn.nnn*

Sends an Address Resolution Protocol (ARP) request to match the `nnn.nnn.nnn.nnn` IP address to an Ethernet hardware address.

clear [yes]

Clears the configuration settings in a Motorola Gateway. You are prompted to confirm the clear command by entering **yes**.

clear_certificate

Removes an SSL certificate that has been installed.

configure

Puts the command line interface into Configure mode, which lets you configure your Motorola Gateway with Config commands. Config commands are described starting on page 95.

download [*server_address*] [*filename*] [confirm]

This command installs a file of configuration parameters into the Motorola Gateway from a TFTP (Trivial File Transfer Protocol) server. The TFTP server must be accessible on your Ethernet network.

You can include one or more of the following arguments with the download command. If you omit arguments, the console prompts you for this information.

- The *server_address* argument identifies the IP address of the TFTP server from which you want to copy the Motorola Gateway configuration file.
- The *filename* argument identifies the path and name of the configuration file on the TFTP server.
- If you include the optional **confirm** keyword, the download begins as soon as all information is entered.

You can also download an SSL certificate file from a trusted Certification Authority (CA), on platforms that support SSL, as follows:

download [-cert] [server_address] [filename] [confirm]

install [*server_address*] [*filename*] [confirm]

Downloads a new version of the Motorola Gateway operating software from a TFTP (Trivial File Transfer Protocol) server, validates the software image, and programs the image into the Motorola Gateway memory. After you install new operating software, you must restart the Motorola Gateway.

The *server_address* argument identifies the IP address of the TFTP server on which your Motorola Gateway operating software is stored. The *filename* argument identifies the path and name of the operating software file on the TFTP server.

If you include the optional keyword *confirm*, you will not be prompted to confirm whether or not you want to perform the operation.

log *message_string*

Adds the message in the `message_string` argument to the Motorola Gateway diagnostic log.

loglevel [*level*]

Displays or modifies the types of log messages you want the Motorola Gateway to record. If you enter the **`loglevel`** command without the optional `level` argument, the command line interface displays the current log level setting.

You can enter the **`loglevel`** command with the `level` argument to specify the types of diagnostic messages you want to record. All messages with a level number equal to or greater than the level you specify are recorded. For example, if you specify loglevel 3, the diagnostic log will retain high-level informational messages (level 3), warnings (level 4), and failure messages (level 5).

Use the following values for the `level` argument:

- **`1`** or **`low`** – Low-level informational messages or greater; includes trivial status messages.
- **`2`** or **`medium`** – Medium-level informational messages or greater; includes status messages that can help monitor network traffic.
- **`3`** or **`high`** – High-level informational messages or greater; includes status messages that may be significant but do not constitute errors.
- **`4`** or **`warning`** – Warnings or greater; includes recoverable error conditions and useful operator information.
- **`5`** or **`failure`** — Failures; includes messages describing error conditions that may not be recoverable.

netstat -i

Displays the IP interfaces for your Motorola Gateway.

netstat -r

Displays the IP routes stored in your Motorola Gateway.

nslookup [*hostname* | *ip_address*]

Performs a domain name system lookup for a specified host.

- The `hostname` argument is the name of the host for which you want DNS information; for example, ***nslookup klaatu***.
- The `ip_address` argument is the IP address, in dotted decimal notation, of the device for which you want DNS information.

ping [-s *size*] [-c *count*] [*hostname* | *ip_address*]

Causes the Motorola Gateway to issue a series of ICMP Echo requests for the device with the specified name or IP address.

- The `hostname` argument is the name of the device you want to ping; for example, ***ping ftp.motorola.com***.
- The `ip_address` argument is the IP address, in dotted decimal notation, of the device you want to locate. If a host using the specified name or IP address is active, it returns one or more ICMP Echo replies, confirming that it is accessible from your network.
- The ***`-s`*** `size` argument lets you specify the size of the ICMP packet.
- The ***`-c`*** `count` argument lets you specify the number of ICMP packets generated for the ping request. Values greater than 250 are truncated to 250.

You can use the **ping** command to determine whether a hostname or IP address is already in use on your network. You cannot use the **ping** command to ping the Motorola Gateway's own IP address.

quit

Exits the Motorola Gateway command line interface.

reset arp

Clears the Address Resolution Protocol (ARP) cache on your unit.

reset crash

Clears crash-dump information, which identifies the contents of the Motorola Gateway registers at the point of system malfunction.

reset dhcp server

Clears the DHCP lease table in the Motorola Gateway.

reset enet [all]

Resets Ethernet statistics to zero. Resets individual LAN switch port statistics as well as wireless and WAN Ethernet statistics (where applicable).

reset firewall-log

Rewinds the firewall log to the first entry.

reset ipmap

Clears the IPMap table (NAT).

reset log

Rewinds the diagnostic log display to the top of the existing Motorola Gateway diagnostic log. The **reset** log command does not clear the diagnostic log. The next **show log** command will display information from the beginning of the log file.

reset wan

This function resets WAN interface statistics.

reset wepkeys

This function allows you to force your wireless WEP key settings back to the default values, if there are default values. For example, on some models, the WEP keys are based on the serial number. This allows you to get back those default settings if you have changed them without the need to reset the entire configuration of the unit.

restart [*seconds*]

Restarts your Motorola Gateway. If you include the optional *seconds* argument, your Motorola Gateway will restart when the specified number of seconds have elapsed. You must enter the complete **restart** command to initiate a restart.

show all-info

Displays all settings currently configured in the Motorola Gateway.

show bridge interfaces

Displays bridge interfaces maintained by the Motorola Gateway.

show bridge table

Displays the bridging table maintained by the Motorola Gateway.

show config

Dumps the Motorola Gateway’s configuration script just as the **`script`** command does in config mode.

show crash

Displays the most recent crash information, if any, for your Motorola Gateway.

show daylight-savings

Displays the auto-daylight savings time settings information.

show dhcp agent

Displays DHCP relay-agent leases.

show dhcp server leases

Displays the DHCP leases stored in RAM by your Motorola Gateway.

show diffserv

Displays the Differentiated Services and QoS values configured in the Motorola Gateway.

show dslf device-association

Displays LAN devices that conform with the TR111 Gateway requirement. It displays - IP Address, Manufacture OUI and Serial number.

show enet [all]

Displays Ethernet interface statistics maintained by the Motorola Gateway. Supports display of individual LAN switch port statistics as well as WAN Ethernet statistics (where applicable).

Example:

```
Ethernet driver full statistics - 10/100 Ethernet

Port Status:  Link up
Type: 100BASET  Duplex: Full

General:
 Transmit OK           : 434
 Receive OK            : 267
 Tx Errors             : 0
 Rx Errors             : 0

Receiver:
 Incompl Packet Errors : 0
 No RBD's For Packet   : 0
 Carrier Sense Lost    : 0
 Deferred Replen       : 0

Transmitter:
 TX Retries            : 0
 Single Collisions     : 0
 No Buf For Packet     : 0

Upper Layers:
 Rx No Handler         : 0
 Rx No Message         : 0
 Rx Octets             : 30773
 Rx Unicast Pkts       : 267
 Rx Multicast Pkts     : 0
 Tx Discards           : 0
 Tx Octets             : 31692

10/100 Ethernet phy.enet.port

Port Status:  Link up
Duplex:  Full-duplex active
Speed:  100BASE-T
 Transmit OK           : 434
 Transmit unicastpkts  : NA
 Receive  OK           : 267
 Receive unicastpkts   : 267
```

show group-mgmt

Displays the IGMP Snooping Table. See “IP IGMP commands” on page 107 for detailed explanation.

show ip arp

Displays the Ethernet address resolution table stored in your Motorola Gateway.

show ip igmp

Displays the contents of the IGMP Group Address table and the IGMP Report table maintained by your Motorola Gateway.

show ip interfaces

Displays the IP interfaces for your Motorola Gateway.

show ip firewall

Displays firewall statistics.

show ip lan-discovery

Displays the LAN Host Discovery Table of hosts on the wired or wireless LAN, and whether or not they are currently online.

show ip routes

Displays the IP routes stored in your Motorola Gateway.

show ipmap

Displays IPMap table (NAT).

6rd-check *6rd_ip_v6_conn_name*

Sends out 6rd loopback packets to the 6rd BG. Verifies 6rd connectivity to the 6rd BG

show ipv6 interfaces

Display IPv6 interfaces.

show ipv6 routes

Display IPv6 route table.

show ipv6 neighbors

Display IPv6 neighbor table.

show ipv6 dhcp server leases

Display DHCPv6 server lease table.

show ipv6 statistics

Display IPv6 statistics information.

show log

Displays blocks of information from the Motorola Gateway diagnostic log. To see the entire log, you can repeat the **`show log`** command or you can enter **`show log all.`**

show memory [all]

Displays memory usage information for your Motorola Gateway. If you include the optional ***all*** argument, your Motorola Gateway will display a more detailed set of memory statistics.

show pppoe

Displays status information for each PPPoE socket, such as the socket state, service names, and host ID values.

show rootcert [all | supplicant | openssl]

Dumps the Subject line for the list of all the trusted root certificates for the supplicant, which is currently a superset of the OpenSSL trusted root certificates.

This syntax is for the 802.1x-supplicant-supported builds only. The openssl trust list is used in all TLS/SSL situations *except* the 802.1X supplicant.

The default, if you don't append a qualifier, is **all**. **all** will show both 802.1x **supplicant** and **openssl** trust list root certs; **supplicant** will show the supplicant trust list root certs; **openssl** will show **openssl** trust list root certs

show rtsp

Displays RTSP ALG session activity data.

show status

Displays the current status of a Motorola Gateway, the device's hardware and software revision levels, a summary of errors encountered, and the length of time the Motorola Gateway has been running since it was last restarted. Identical to the **status** command.

show summary

Displays a summary of WAN, LAN, and Gateway information.

show vlan

Displays detail of VLAN status and statistics.

show wireless [all]

Shows wireless status and statistics.

show wireless clients [*MAC_address*]

Displays details on connected clients, or more details on a particular client if the MAC address is added as an argument.

telnet [*hostname* | *ip_address*] [*port*]

Lets you open a telnet connection to the specified host through your Motorola Gateway.

- The *hostname* argument is the name of the device to which you want to connect; for example, ***telnet ftp.Motorola.com***.
- The *ip_address* argument is the IP address, in dotted decimal notation, of the device to which you want to connect.
- The *port* argument is the number of t he port over which you want to open a telnet session.

traceroute (*ip_address* | *hostname*)

Traces the routing path to an IP destination.

upload [*server_address*] [*filename*] [confirm]

Copies the current configuration settings of the Gateway to a TFTP (Trivial File Transfer Protocol) server. The TFTP server must be accessible on your Ethernet network. The *server_address* argument identifies the IP address of the TFTP server on which you want to store the Motorola Gateway settings. The *filename* argument identifies the path and name of the configuration file on the TFTP server. If you include the optional **confirm** keyword, you will not be prompted to confirm whether or not you want to perform the operation.

view config

Dumps the Motorola Gateway's configuration just as the **`view`** command does in config mode.

who

Displays the names of the current shell and PPP users.

WAN Commands

atmping vccn [*segment* | *end-to-end*]

Lets you check the ATM connection reachability and network connectivity. This command sends five Operations, Administration, and Maintenance (OAM) loopback calls to the specified vpi/vci destination. There is a five second total timeout interval.

Use the **`segment`** argument to ping a neighbor switch.
Use the **`end-to-end`** argument to ping a remote end node.

reset dhcp client release [*vcc-id*]

Releases the DHCP lease the Motorola Gateway is currently using to acquire the IP settings for the specified DSL port. The ***`vcc-id`*** identifier is an "index" letter in the range B-I, and does not directly map to the VCC in use. Enter the **`reset dhcp client release`** command without the variable to see the letter assigned to each virtual circuit.

reset dhcp client renew [*vcc-id*]

Renews the DHCP lease the Motorola Gateway is currently using to acquire the IP settings for the specified DSL port. The ***`vcc-id`*** identifier is an "index" letter in the range B-I, and does not directly map to the VCC in use. Enter the **`reset dhcp client release`** without the variable to see the letter assigned to each virtual circuit.

reset dsl

Resets any open DSL connection.

reset ppp *vccn*

Resets the point-to-point connection over the specified virtual circuit. This command only applies to virtual circuits that use PPP framing.

show atm [all]

Displays ATM statistics for the Motorola Gateway. The optional **`all`** argument displays a more detailed set of ATM statistics.

show dsl [all]

Displays DSL port statistics, such as upstream and downstream connection rates and noise levels.

show ppp [{ stats | lcp | ipcp }]

Displays information about open PPP links. You can display a subset of the PPP statistics by including an optional **`stats, lcp`**, or **`ipcp`** argument for the **`show ppp`** command.

start ppp vccn

Opens a PPP link on the specified virtual circuit.

About CONFIG Commands

You reach the configuration mode of the command line interface by typing ***configure*** (or any truncation of ***configure***, such as ***con*** or ***config***) at the CLI SHELL prompt.

CONFIG Mode Prompt

When you are in CONFIG mode, the CLI prompt consists of the name of the Motorola Gateway followed by your current **node** in the hierarchy and two right angle brackets (>>). For example, when you enter CONFIG mode (by typing ***config*** at the SHELL prompt), the **`Motorola-3000/9437188 (top)>>`** prompt reminds you that you are at the top of the CONFIG hierarchy. If you move to the **`ip`** node in the CONFIG hierarchy (by typing **`ip`** at the CONFIG prompt), the prompt changes to **`Motorola-3000/9437188 (ip)>>`** to identify your current location.

Some CLI commands are not available until certain conditions are met. For example, you must enable IP for an interface before you can enter IP settings for that interface.

Navigating the CONFIG Hierarchy

- **Moving from CONFIG to SHELL** — You can navigate from anywhere in the CONFIG hierarchy back to the SHELL level by entering quit at the CONFIG prompt and pressing Return.

```
Motorola-3000/9437188 (top)>> quit
Motorola-3000/9437188 >
```

- **Moving from *top* to a subnode** — You can navigate from the top node to a subnode by entering the node name (or the significant letters of the node name) at the CONFIG prompt and pressing RETURN. For example, you move to the IP subnode by entering **`ip`** and pressing RETURN.

```
Motorola-3000/9437188 (top)>> ip
Motorola-3000/9437188 (ip)>>
```

As a shortcut, you can enter the significant letters of the node name in place of the full node name at the CONFIG prompt. The significant characters of a node name are the letters that uniquely identify the node. For example, since no other CONFIG node starts with b, you could enter one letter ("**`b`**") to move to the bridge node.

- **Jumping down several nodes at once** — You can jump down several levels in the CONFIG hierarchy by entering the complete path to a node.
- **Moving up one node** — You can move up through the CONFIG hierarchy one node at a time by entering the **`up`** command.
- **Jumping to the top node** — You can jump to the top level from anywhere in the CONFIG hierarchy by entering the **`top`** command.
- **Moving from one subnode to another** — You can move from one subnode to another by entering a partial path that identifies how far back to climb.
- **Moving from any subnode to any other subnode** — You can move from any subnode to any other subnode by entering a partial path that starts with a top-level CONFIG command.
- **Scrolling backward and forward through recent commands** — You can use the Up and Down arrow keys to scroll backward and forward through recent commands you have entered. When the command you want appears, press Enter to execute it.

Entering Commands in CONFIG Mode

CONFIG commands consist of keywords and arguments. Keywords in a CONFIG command specify the action you want to take or the entity on which you want to act. Arguments in a CONFIG command specify the values appropriate to your site. For example, the CONFIG command

set ip ethernet A *ip_address*

consists of two keywords (***ip*,** and ***ethernet A***) and one argument (*ip_address*). When you use the command to configure your Gateway, you would replace the argument with a value appropriate to your site.

For example:

```
set ip ethernet A 192.31.222.57
```

Guidelines: CONFIG Commands

The following table provides guidelines for entering and formatting CONFIG commands.

Command component	Rules for entering CONFIG commands
Command verbs	CONFIG commands must start with a command verb (set, view, delete).
	You can truncate CONFIG verbs to three characters (set, vie, del).
	CONFIG verbs are case-insensitive. You can enter “SET,” “Set,” or “set.”
Keywords	Keywords are case-insensitive. You can enter “Ethernet,” “ETHERNET,” or “ethernet” as a keyword without changing its meaning.
	Keywords can be abbreviated to the length that they are differentiated from other keywords.
Argument Text	Text strings can be as many as 64 characters long, unless otherwise specified. In some cases they may be as long as 255 bytes.
	Special characters are represented using backslash notation.
	Text strings may be enclosed in double (“) or single (‘) quote marks. If the text string includes an embedded space, it must be enclosed in quotes.
	Special characters are represented using backslash notation.
Numbers	Enter numbers as integers, or in hexadecimal, where so noted.
IP addresses	Enter IP addresses in dotted decimal notation (0 to 255).

If a command is ambiguous or miskeyed, the CLI prompts you to enter additional information. For example, you must specify which virtual circuit you are configuring when you are setting up a Motorola Gateway.

Displaying Current Gateway Settings

You can use the ***view*** command to display the current CONFIG settings for your Motorola Gateway. If you enter the ***view*** command at the top level of the CONFIG hierarchy, the CLI displays the settings for all enabled functions. If you enter the ***view*** command at an intermediate node, you see settings for that node and its subnodes.

Step Mode: A CLI Configuration Technique

The Motorola Gateway command line interface includes a step mode to automate the process of entering configuration settings. When you use the CONFIG step mode, the command line interface prompts you for all required and optional information. You can then enter the configuration values appropriate for your site without having to enter complete CLI commands.

When you are in step mode, the command line interface prompts you to enter required and optional settings. If a setting has a default value or a current setting, the command line interface displays the default value for the command in parentheses. If a command has a limited number of acceptable values, those values are presented in brackets, with each value separated by a vertical line. For example, the following CLI step command indicates that the default value is **`off`** and that valid entries are limited to **`on`** and **`off`**.

```
option (off) [on | off]: on
```

You can accept the default value for a field by pressing the Return key. To use a different value, enter it and press Return.

You can enter the CONFIG step mode by entering ***set*** from the top node of the CONFIG hierarchy. You can enter step mode for a particular service by entering ***set*** *service_name***.** In stepping set mode (press Control-X <Return/Enter> to exit. For example:

```
Motorola-3000/9437188 (top)>> set system
...
system
   name ("Motorola-3000/9437188"): Mycroft
   Diagnostic Level (High): medium
Stepping mode ended.
```

Validating Your Configuration

You can use the **`validate`** CONFIG command to make sure that your configuration settings have been entered correctly. If you use the **`validate`** command, the Motorola Gateway verifies that all required settings for all services are present and that settings are consistent.

```
Motorola-3000/9437188 (top)>> validate
Error: Subnet mask is incorrect
Global Validation did not pass inspection!
```

You can use the **`validate`** command to verify your configuration settings at any time. Your Motorola Gateway automatically validates your configuration any time you save a modified configuration.

CONFIG Commands

This section describes the keywords and arguments for the various CONFIG commands.

Connection commands

conns are used to create connections, for example, a WAN or LAN **conn.** There may be more than one of each depending on your model. **name**s correspond to the system object IDs (OIDs) but you can name them yourself.

set conn name *name* link-oid *value*

Sets the connection named *name* to point to an associated link specified by the **link-oid** value.

set conn name *name* type [static | dhcpc]

Specifies whether the **type** of the connection named *name* is static or dhcpc.

set conn name *name* side [lan | wan]

Specifies whether this conn is LAN- or WAN-side. A **conn** can be either **lan** or **wan**.

set conn name *name* dhcp-server-enable [on | off]

Turns the DHCP server for this connection **on** or **off**. The DHCP server can be enabled per connection. The default is **on**.

set conn name *name* mcast-forwarding [off | on]

Turns IP IGMP multicast forwarding for this connection **off** or **on**. The default is **off**.

set conn name *name* static ipaddr *ipaddr*

Specifies a **static** IP address when the connection **type** has been set to **static**. The default is 192.168.1.254

set conn name *name* static netmask *netmask*

Specifies a **static** netmask when the connection **type** has been set to **static**. The default is 255.255.255.0.

set conn name *name* dhcp-server start-addr *ipaddr*

If **dhcp-server-enable** is set to **on**, specifies the first address in the DHCP address range. The Motorola Gateway can reserve a sequence of up to 253 IP addresses within a subnet, beginning with the specified address for dynamic assignment. The default is 192.168.1.64

set conn name *name* dhcp-server end-addr *ipaddr*

If **dhcp-server-enable** is set to **on**, specifies the last address in the DHCP address range. The default is 192.168.1.253

set conn name *name* dhcp-server lease-time *seconds*

If **dhcp-server-enable** is set to **on**, specifies the default length for DHCP leases issued by the Motorola Gateway. Lease time is in seconds. Default is **3600**.

set conn name *name* nat-enable [on | off]

Specifies whether you want the Motorola Gateway to use network address translation (NAT) when communicating with remote Gateways. NAT lets you conceal details of your network from remote Gateways. It also permits all LAN devices to share a single IP address. By default, address NAT is turned **on**.

set conn name *name* dhcp-client discover-time *seconds*

The DHCP client parameters appear when the connection **type** has been set to **dhcpc**. **discover-time** is in seconds; the default is **30**.

set conn name *name* dhcp-client dns-enable [on | off]

This allows you to enable or disable the default behavior of acting as a DNS proxy. The default is **on**.

set conn name *name* dhcp-client dns-override [off | on]

This allows you to enable or disable overriding default DNS behavior. The default is **off**.

set conn name *name* dhcp-client vendor-class *string*

The **vendor-class** default information varies by model and components. This is information that identifies the unit.

set conn name *name* fs-egress *filterset_name*

Attaches a user filterset to a conn which is applied to transmitted packets. See "Filterset commands" on page 96.

set conn name *name* fs-ingress *filterset_name*

Attaches a user filterset to a conn which is applied to received packets. See "Filterset commands" on page 96.

Filterset commands

Filtersets provide packet filtering and QoS configuration. Packets are identified by characteristics that allow QoS and forwarding decisions to be made. These characteristics can be at the MAC layer, IP layer, TCP | UDP | ICMP layer(s), or (in applicable circumstances) 802.1q/p (VLAN-tagging) layer.

A maximum of 8 filtersets are supported. Each filterset can have up to 8 rules configured. A maximum 8 egress queues are supported. Each queue can have up to 8 entries.

A filterset rule identifies packet attributes to match with its **match** parameters. It acts on these packets using its **default action** parameters.

set filterset name *filterset_name* rule *number* order *number*

Determines order of execution of filterset rules (1 before 2, etc).

set filterset name *filterset_name* rule *number* match-eth-proto *number*

Matches ethernet protocol field to the supplied value.

set filterset name *filterset_name* rule *number* match-eth-length *number*

Matches ethernet length field to the supplied value.

set filterset name *filterset_name* rule *number* match-eth-p-bits *number*

Matches VLAN priority bits.

set filterset name *filterset_name* rule *number* match-eth-vid *number*

Matches VLAN id number.

set filterset name *filterset_name* rule *number* match-eth-src-mac-addr *mac_address*

Matches supplied source MAC address field.

set filterset name *filterset_name* rule *number* match-eth-dst-mac-addr *mac_address*

Matches supplied destination MAC address field.

set filterset name *filterset_name* rule *number* match-src-ip-addr *ip_address_range*

Matches supplied value with packet's source ip address field.

set filterset name *filterset_name* rule *number* match-dst-ip-addr *ip_address_range*

Matches supplied value with packet's destination ip address field.

set filterset name *filterset_name* rule *number* match-protocol *protocol_string*

Matches supplied value with packet's protocol field.

set filterset name *filterset_name* rule *number* match-tos [*number* | *descriptive_value*]

Matches tos field from numeric value 0-255; or one of the following descriptive values:

```
Minimize-Delay (0x10)
Maximize-Throughput (0x08)
Maximize-Reliability (0x04)
Minimize-Cost (0x02)
Normal-Service (0x00)
```

set filterset name *filterset_name* rule *number* match-dscp [*number* | *diffserv_class_string*]

Matches diffserv class with supplied numerical value, which can be in decimal(ex: 32) or in Hex(ex: 0x20);

Or match the supplied diffserv class. This value may be any of the BE, EF, AFxx or CSx classes. A full list is:

```
{ "CS0", 0x00 }
{ "CS1", 0x08 }
{ "CS2", 0x10 }
{ "CS3", 0x18 }
{ "CS4", 0x20 }
{ "CS5", 0x28 }
{ "CS6", 0x30 }
{ "CS7", 0x38 }
{ "BE", 0x00 }
{ "AF11", 0x0a }
{ "AF12", 0x0c }
{ "AF13", 0x0e }
{ "AF21", 0x12 }
{ "AF22", 0x14 }
{ "AF23", 0x16 }
{ "AF31", 0x1a }
{ "AF32", 0x1c }
{ "AF33", 0x1e }
{ "AF41", 0x22 }
{ "AF42", 0x24 }
{ "AF43", 0x26 }
{ "EF", 0x2e }
```

set filterset name *filterset_name* rule *number* match-src-port *number* [*number*]

Matches TCP|UDP source port field or port range.

set filterset name *filterset_name* rule *number* match-dst-port *number* [*number*]

Matches TCP|UDP destination port field or port range.

set filterset name *filterset_name* rule *number* match-tcp-flags *tcp_flag_string*

Matches TCP flags in a packet. The flag string is comma-delimited.

set filterset name *filterset_name* rule *number* match-pkt-length *number* [*number*]

Matches packet length against value or range.

set filterset name *filterset_name* rule *number* action forward [pass | drop | reject]

Executes the named filterset's default action: **pass**, **drop**, or **reject**.

set filterset name ***filterset_name*** rule *number* action set-qos-marker *qos_marker_string*

Tags the packet according to the queue marker name. See "Queue commands" on page 100.

set filterset name *filterset_name* rule *number* action set-tos *number*

Sets the packet tos field to the supplied value.

set filterset name *filterset_name* rule *number* action set-dscp [*number* | *diffserv_class_string*]

Sets the dscp field to the supplied value.

set filterset name *filterset_name* rule *number* action set-eth-p-bits *number*

Sets vlan priority bits to the supplied value.

set filterset *filterset_name* **rule** *number* **action do-filterset** *name*

Executes the supplied filterset.

Default actions

If a packet passes through all of a filter's rules without a match, then the filterset's default-actions come into play. These behave the same way that rule actions behave.

set filterset name *filterset_name* **default-action set-qos-marker** *qos_marker_string*

Tags the packet according to the queue marker name.

set filterset name *filterset_name* **default-action set-tos** *number*

Sets the packet tos field to the supplied value.

set filterset name *filterset_name* **default-action set-dscp [** *number* **|** *diffserv_class_string* **]**

Sets the dscp field to the supplied value.

set filterset name *filterset_name* **default-action set-eth-p-bits** *number*

Sets vlan priority bits to the supplied value.

set filterset name *filterset_name* **default-action do-filterset** *name*

Executes the supplied filterset.

set filterset name *filterset_name* **default-action forward [pass | drop | reject]**

Executes the named filterset’s default action: **pass**, **drop**, or **reject**.

Queue commands

Queue configuration typically requires a classification component to set a QoS marker to a packet and a queueing component to schedule the marked packets to the link. This is accomplished using filtersets ("Filterset commands" on page 96).

the following types of queue "building blocks" are supported:

- **basic** queue
- **ingress** queue
- **priority** queue
- **wfq** (weighted fair queue)

Basic queues have three different packet dropping options

- byte|packet fifo (bpfifo)
- random early discard (**red**)
- stochastic fairness queuing (**sfq**)

set queue name *queue_name* type [basic | ingress | priority | wfq]

Sets the type of queue.

set queue name *queue_name* options [off | red | sfq]

Sets the queue packet dropping options.

set queue name *queue_name* size [1... 64]

Sets the maximum packet size in the queue.

set queue name *queue_name* bytes [2048... 131072]

Sets the maximum byte size in the queue.

set queue name *queue_name* perturb [0... 100]

Sets the interval in seconds for queue algorithm perturbation when queue option is **sfq**.

set queue name *queue_name* police-rate [0... 100000000]

Sets the rate in milliseconds that is used for policing traffic when the queue type is **ingress**.

set queue name *queue_name* police-burst [0... 100000000]

Sets the burst rate in milliseconds that is used for policing traffic when the queue type is **ingress**.

set queue name *queue_name* bw-sharing [on | off]

Enables or disables bandwidth sharing, when the queue type is either **priority** or **wfq**.

set queue name *queue_name* bps-mode [bps | relative]

Sets the mode of the weighted fair queue. **bps** indicates that weights are defined as "bits-per-second". **relative** indicates that weights are defined as a proportion of the sum of the weights of all inputs to the **wfq**.

set queue name *queue_name* entry *number* input *queue_name*

Sets the input to a priority or weighted fair queue.

set queue name *queue_name* entry *number* marker *queue_marker*

Sets the marker with which packets must be marked to be directed to this queue entry's input queue when the type is **priority** or **wfq**.

set queue name *queue_name* entry *number* priority [0... 255]

Sets the priority level of this queue. A lower value indicates a higher priority. All entries of equal priority will be subject to a round robin algorithm.

- for (strict) **priority** queue, the higher priority gets link resource first.
- for **wfq** queue, each entry gets reserved bandwidth according to its weight. If different priority is given, any excess bandwidth is offered to higher priority entry first; otherwise any excess bandwidth is distributed to the weights ratio.

set queue name *queue_name* entry *number* weight [0... 100]

Sets the weight level of this weighted fair queue. Weight units are dependent on **bps-mode** setting.

- If **bps-mode** is set to **bps**, then setting the weight to 0 will allocate the remaining available bandwidth to the queue entry.
- If no priority specified, excess bandwidth will be distributed proportionately to the weight ratio.

set queue name *queue_name* default-entry *queue_name*

Indicates the input queue which is used if there is no match between the packet queue marker and the configured markers in any of the queue's inputs when the queue type is **priority** or **wfq**.

IP Gateway commands

set ip gateway enable [on | off]

Specifies the **conn** of the gateway. Normally, this would be the WAN connection. Specifies whether the Motorola Gateway should send packets to a default Gateway if it does not know how to reach the destination host.

set ip gateway conn-oid *value*

Sets the default Gateway to point to an associated link specified by the **conn-oid** value.

set ip gateway address *ip_address*

Specifies the IP address of a host on a local or remote network in standard dotted-quad format.

IPv6 Commands

set ip6 enable [on | off]

Enables/disables IPv6 globally.

ip6 conn

set ip6 conn name *name* enable [on | off]

Enables/disables the IPv6 connection named ***name***.

set ip6 conn name *name* type [static | autoconf | rd | dp | aiccu]

Type of connection. See below for connection types.

set ip6 conn name *name* mtu *octets*

Specified MTU of connection.

set ip6 conn name *name* side [lan | wan]

Specified whether the connection is LAN side or WAN side.

set ip6 conn name *name* mcast-fwding [off | on]

Turns IPv6 multicast forwarding for this connection off or on. The default is **off**. (not yet implemented)

set ip6 conn name *name* old-prefix-purge-timer

The time in seconds for which old, invalid prefixes are advertised with a lifetime of zero. The intent is to "flush out" global prefixes on attached IPv6 hosts which suddenly become invalid.

Static Connections

ip6 conn (type = static): Statically configured IPv6 connection.

set ip6 conn name *name* static link-oid *link_name*

Sets the connection named name to point to an associated link specified by the link-oid ***link_name***.

set ip6 conn name *name* static ipaddr *ipv6_address*

Specifies a static IPv6 address.

set ip6 conn name *name* static prefix-length *value*

Specifies the prefix length of the connection's static IPv6 address. Default is **64**.

6rd Connections

ip6 conn (type = rd, side = wan). This WAN connection type is a 6rd tunnel over an IPv4 conn in accordance with RFC 5569.

set ip6 conn name *name* 6rd-tunnel type [cpe | gateway]

The 6rd connection can operate in "cpe" or "gateway" mode as configured by the type parameter. "cpe" mode is used when operating as a CPE; "gateway" mode is used when operating as a "6rd relay" as per RFC 5569.

set ip6 conn name *name* 6rd-tunnel ipv4-conn-oid *ipv4_name*

Sets the 6rd connection named ***name*** to tunnel over an associated IPv4 connection named ***ipv4_name***.

set ip6 conn name *name* 6rd-tunnel use-dhcp-values [off | on]

If this parameter is on, 6rd-provisioned parameters are obtained via the underlying DHCPv4 client associated with IPv4 connection named ipv4-name. See “draft-ietf-softwire-ipv6-6rd-10” for DHCP format description.

ip6 conn (type = rd, 6rd-tunnel use-dhcp-values = off).

set ip6 conn name *name* 6rd-tunnel prefix *IPv6_address*

6rd domain prefix.

set ip6 conn name *name* 6rd-tunnel prefix-length *value* [1 - 63]

6rd domain prefix length.

set ip6 conn name *name* 6rd-tunnel ipv4-common-bits *value* [0 - 31]

The number of bits common to all IPv4 addresses within the 6rd domain. The top-most bits of the IPv4 address will be “subtracted” from the 6rd address. If the whole 32-bit IPv4 address is contained in the 6rd IPv6 address, this value is set to zero. Default is 0, meaning all 42 bits of the IPv4 address are embedded in the 6rd prefix.

set ip6 conn name *name* 6rd-tunnel relay-ipv4-addr *IPv4_address*

The IPv4 anycast address of the 6rd border gateway.

set ip6 conn name *name* 6rd-tunnel ipv4-tx-tos-mode [off | use-ipv6]

off means the TOS field in the IPv4 header is set to zero for transmitted 6rd packets. **use-ipv6** means the the TOS field in the IPv4 header is set to the DS field of the 6rd-encapsulated IPv6 packet.

set ip6 conn name *name* 6rd-tunnel ipv4-tx-to-br [off | on]

off means each packet set to a destination IPv6 address within the originating 6rd domain is sent directly to the 6rd endpoint. **on** means that all packets are transmitted to the 6rd border gateway.

AICCU (SixXS tunnel broker) Connections

ip6 conn (type = aiccu, side = wan). This connection type enables an IPv6 connection to the IPv6 internet over an IPv4/NAT/UDP tunnel to a tunnel endpoint administered by tunnel broker SIXXS (www.sixxs.net).

You set up an account with SIXXS, and subsequently get assigned a tunnel and a subnet (usually a /48 subnet).

set ip6 conn name *name* aiccu username *username*

SIXXS username.

set ip6 conn name *name* aiccu password *password*

SIXXS password.

Delegated Prefix Connections

ip6 conn (type = dp, side = lan). A conn of type "delegated prefix" obtains its global prefix information from one or more prefix another IPv6 conn (typically a WAN conn) , if available. In order for a "dp" connection to become fully operational, its underlying link must be up AND the IPv6 connection which delegates the prefix must have created one or more prefixes from which to draw the "dp" connection's global prefix.

set ip6 conn name *name* dp link-oid *link_name*

set ip6 conn name *name* dp conn-oid *ipv6_conn_name*

Sets the dp connection named name to obtain its prefix from IPv6 connection named ***ipv6_conn_name***.

set ip6 conn name *name* dp subnet-length *value* [0 - 16]

The length of the subnet portion of the delegated prefix. Default is **0**.

set ip6 conn name *name* dp subnet-id *value* [0 - 65535]

If a subnet length is specified, the value that would occupy the of the subnet portion of the conn's IPv6 prefix. Default is **0**.

set ip6 conn name *name* dp stay-up [off | on]

If the delegated prefix parameter **stay-up** is set to **on**, the global prefix assigned from the conn delegating the prefix remains active in the event that the conn delegating the prefix goes down, and the prefix becomes invalid. This enables local LAN-side hosts to continue to use the global prefix uninterrupted. If parameter **stay-up** is set to **off**, the connection's delegated prefix becomes invalid when the connection named **ipv6-conn-name** delegating the prefix goes down.

Router Advertisement and DHCPv6 Server

ip6 conn (side = lan). Router Advertisements and the DHCPv6 server are available on LAN-side conns as the means to provide clients with stateful or stateless IPv6 prefixes and addresses, as well as addition client parameters such as MTU size and IPv6-addressable DNS servers.

set ip6 conn name *name* radv enable [off | on]

on means radv is enabled for this conn.

set ip6 conn name *name* radv min-rtr-adv-interval *seconds* [3 - 1350]

The minimum time allowed between sending unsolicited multicast router advertisements from the link, in seconds.

set ip6 conn name *name* radv max-rtr-adv-interval *seconds* [4 - 1800]

The maximum time allowed between sending unsolicited multicast router advertisements from the interface, in seconds.

set ip6 conn name *name* dhcp-server enable [off | on]

on means the DHCPv6 server is enabled for this conn.

set ip6 conn name *name* dhcp-server addr-count *value* [0 - 256]

The number of IPv6 addresses available to serve to DHCPv6 stateful clients. If the **addr-count** parameter is set to zero, the DHCPv6 server operates in “stateless” mode.

set ip6 conn name *name* dhcp-server start-addr-offset *value* [0 - 65536]

If the **addr-count** parameter is greater than zero, the start address is an offset from the base address of the prefix which is assigned to the LAN conn.

set ip6 conn name *name* dhcp-server lease-time *seconds* [180 - 8553600]

DHCPv6 lease time.

set ip6 conn name name dhcp-server dns-server optional IPv6 address

IPv6 address of advertised DNS server (optiona).

Static Routes

ip6 static-route.

set ip6 static-route *name* conn-oid *ipv6_conn_name*

Route is directed to IPv6 connection named ***ipv6_conn_name***.

set ip6 static-route *name* nexthop *IPv6_address*

Next-hop IPv6 address for forwarding. Can be a global or link-local address.

set ip6 static-route *name* prefix *IPv6_prefix*

IPv6 prefix.

set ip6 static-route *name* prefix-length *value* [1 - 64]

IPv6 prefix-length.

set ip6 static-route *name* metric *value* [0 - 255]

metric assigned to route.

IP DNS commands

set ip dns domain-name *domain_name*

Specifies the default domain name for your network. When an application needs to resolve a host name, it appends the default domain name to the host name and asks the DNS server if it has an address for the "fully qualified host name."

set ip dns primary-address *ip_address*

Specifies the IP address of the primary DNS name server.

set ip dns secondary-address *ip_address*

Specifies the IP address of the secondary DNS name server. Enter **0.0.0.0** if your network does not have a secondary DNS name server.

set ip dns proxy-enable [on | off]

This allows you to disable the default behavior of acting as a DNS proxy. The default is **on**.

IP IGMP commands

Multicasting is a method for transmitting large amounts of information to many, but not all, computers over an internet. One common use is to distribute real time voice, video, and data services to the set of computers which have joined a distributed conference. Other uses include updating the address books of mobile computer users in the field, or sending out company newsletters to a distribution list.

Since a router should not be used as a passive forwarding device, Motorola Gateways use a protocol for forwarding multicasting: Internet Group Management Protocol (IGMP).

Motorola Gateways support IGMP Version 1, Version 2, or Version 3.

IGMP "Snooping" is a feature of Ethernet layer 2 switches that "listens in" on the IGMP conversation between computers and multicast routers. Through this process, it builds a database of where the multicast routers reside by noting IGMP general queries used in the querier selection process and by listening to other router protocols.

From the host point of view, the snooping function listens at a port level for an IGMP report. The switch then processes the IGMP report and starts forwarding the relevant multicast stream onto the host's port. When the switch receives an IGMP leave message, it processes the leave message, and if appropriate stops the multicast stream to that particular port. Basically, customer IGMP messages although processed by the switch are also sent to the multicast routers.

In order for IGMP snooping to function with IGMP Version 3, it must always track the full source filter state of each host on each group, as was previously done with Version 2 only when Fast Leave support was enabled.

IGMP Version 3 supports:

IGMP Source Filtering: the ability for group memberships to incorporate source address filtering. This allows "Source-Specific Multicast" (SSM). By adding source filtering, a Gateway that proxies IGMP can more selectively join the specific multicast group for which there are interested LAN multicast receivers.

These features require no user configuration on the Gateway.

You can set the following options:

- **IGMP Snooping** – enables the Motorola Gateway to "listen in" to IGMP traffic. The Gateway discovers multicast group membership for the purpose of restricting multicast transmissions to only those ports which have requested them. This helps to reduce overall network traffic from streaming media and other bandwidth-intensive IP multicast applications.
- **Robustness** – a way of indicating how sensitive to lost packets the network is. IGMP can recover from robustness minus 1 lost IGMP packet. The default value is 2.
- **Query Interval**– the amount of time in seconds between IGMP General Query messages sent by the querier gateway. The default query interval is 125 seconds.
- **Query Response Interval** – the maximum amount of time in tenths of a second that the IGMP Gateway waits to receive a response to a General Query message. The default query response interval is 10 seconds and must be less than the query interval.
- **Unsolicited Report Interval** – the amount of time in seconds between repetitions of a particular computer's initial report of membership in a group. The default unsolicited report interval is 10 seconds.
- **Querier Version** – select a version of the IGMP Querier: version **1**, version **2**, or version 3. If you know you will be communicating with other hosts that are limited to v1 or v2, for backward compatibility, select accordingly; otherwise, allow the default v3.

NOTE:

IGMP Querier version is relevant only if the Gateway is configured for IGMP forwarding. If any IGMP v1 routers are present on the subnet, the querier **must** use IGMP v1. The use of IGMP v1 must be administratively configured, since there is no reliable way of dynamically determining whether IGMP v1 routers are present on a network. IGMP forwarding is enabled per IP Profile and WAN Connection Profile.

- **Last Member Query Interval** – the amount of time in tenths of a second that the IGMP gateway waits to receive a response to a Group-Specific Query message. The last member query interval is also the amount of time in seconds between successive Group-Specific Query messages. The default last member query interval is 1 second (10 deci-seconds).
- **Last Member Query Count** – the number of Group-Specific Query messages sent before the gateway assumes that there are no members of the host group being queried on this interface. The default last member query count is 2.
- **Fast Leave** – set to **off** by default, fast leave enables a non-standard expedited leave mechanism. The querier keeps track of which client is requesting which channel by IP address. When a leave message is received, the querier can check its internal table to see if there are any more clients on this group. If there are none, it immediately sends an IGMP leave message to the upstream querier.
- **Log Enable** – If set to on, all IGMP messages on both the LAN and the WAN will be logged.
- **Wireless Multicast to Unicast conversion** – Only available if **IGMP Snooping** is enabled. If set to **on**, the Gateway replaces the multicast MAC-address with the physical MAC-address of the wireless client. If there is more than one wireless client interested in the same multicast group, the Gateway will revert to multicasting the stream immediately. When one or more wireless clients leave a group, and the Gateway determines that only a single wireless client is interested in the stream, it will once again unicast the stream.

set ip igmp querier-version [1 | 2 | 3]

Sets the IGMP querier version: version **1**, version **2**, or version **3**. If you know you will be communicating with other hosts that are limited to v1, for backward compatibility, select **1**; otherwise, allow the default **3**.

set ip igmp robustness *value*

Sets IGMP robustness range: from 2 – 255. The default is 2.

set ip igmp query-interval *value*

Sets the query-interval range: from 10 seconds – 600 seconds, The default is 125 seconds.

set ip igmp query-response-interval *value*

Sets the query-response interval range: from 5 deci-seconds (tenths of a second) – 255 deci-seconds. The default is 100 deci-seconds.

set ip igmp unsolicited-report-interval *value*

Sets the unsolicited report interval: the amount of time in seconds between repetitions of a particular computer’s initial report of membership in a group. The default is 10 seconds.

set ip igmp last-member-interval *value*

Sets the last member query interval: the amount of time in tenths of a second that the IGMP gateway waits to receive a response to a Group-Specific Query message. The last member query interval is also the amount of time in seconds between successive Group-Specific Query messages. The default is 1 second (10 deci-seconds).

set ip igmp last-member-count *value*

Sets the last member query count: the number of Group-Specific Query messages sent before the gateway assumes that there are no members of the host group being queried on this interface. The default is 2.

set ip igmp snoop-entry-time *seconds*

The **snoop-entry-time** is the amount of time an entry will remain in the snooping table (in seconds) after being added. An entry is added when a “JOIN” is seen from a multicast client. Any new joins (triggered by upstream queries) will reset the timeout back to *seconds*. If no additional joins are seen, the entry will expire after *seconds*. Default is **130**.

set ip igmp snooping-unreg-mode [block | flood]

The **snooping-unreg-mode** can be set to **block** or **flood**. This indicates what should happen to unregistered multicast traffic – traffic that hasn't been subscribed to by any clients. If set to **flood**, the traffic will be sent to all LAN ports. If set to **block**, the traffic will not be sent to any LAN ports; it will be dropped. Default is **block**.

NTP commands

set ip ntp enable [on | off]

Enables or disables acquiring the time of day from an NTP (Network Time Protocol) server.

set ip ntp server-address *server_address*

set ip ntp alt-server-address *alt_server_address*

Specify the NTP server(s) to use for time updates. The NTP **server-address** and **alt-server-address** can be entered as DNS names as well as IP addresses.

set ip ntp update-period *minutes*

update-period specifies how often, in minutes, the Gateway should update the clock. Default is **60**.

Application Layer Gateway (ALG) commands

These commands allow you to enable or disable the router's support for a variety of Application Layer Gateways (ALGs). An application layer gateway (ALG) is a NAT component that helps certain application sessions to pass cleanly through NAT. Each ALG has a slightly different function based on the particular application's protocol-specific requirements.

An internal client first establishes a connection with the ALG. The ALG determines if the connection should be allowed or not and then establishes a connection with the destination computer. All communications go through two connections – client to ALG and ALG to destination. The ALG monitors all traffic against its rules before deciding whether or not to forward it. The ALG is the only address seen by the public Internet so the internal network is concealed. In some situations, it may be desirable to disable some of the ALGs.

set ip alg esp-enable [on | off]

Turns the ESP (Encapsulated Security Payload) ALG for file transfers **on** or **off**. Default is **on**.

set ip alg esp-setup-timeout *value*

Specifies the timeout value for the ESP ALG setup. Default is **180**.

set ip alg esp-stream-timeout *value*

Specifies the timeout value for the ESP ALG streaming. Default is **300**.

set ip alg ftp-enable [on | off]

Turns the FTP (File Transfer Protocol) ALG for file transfers **on** or **off**. Default is **on**.

set ip alg h323-enable [on | off]

Turns the H323 ALG for audio, video, and data communications across IP-based networks **on** or **off**. Default is **on**.

set ip alg pptp-enable [on | off]

Turns the PPTP (Point-to-Point Transfer Protocol) ALG for authentication **on** or **off**. Default is **on**.

set ip alg sip-enable [on | off]

Turns the SIP (Session Initiation Protocol) ALG for voice communication initiation **on** or **off**. Default is **on**.

set ip alg tftp-enable [on | off]

Turns the TFTP (Trivial File Transfer Protocol) ALG for simple file transfers and firmware updates **on** or **off**. Default is **on**.

Dynamic DNS Commands

set ip dynamic-dns enable [off | on]

Enables or disables Dynamic DNS. Dynamic DNS support allows you to use the free services of www.dyndns.org. Dynamic DNS automatically directs any public Internet request for your computer's name to your current dynamically-assigned IP address. This allows you to get to the IP address assigned to your Gateway, even though your actual IP address may change as a result of a PPPoE connection to the Internet.

set ip dynamic-dns service-type [dyndns]
set ip dynamic-dns username *myusername*
set ip dynamic-dns password *mypassword*
set ip dynamic-dns hostname *myhostname*
set ip dynamic-dns retries [1 - 64]

Enables or disables dynamic DNS services. The default is **off**. If you specify **dyndns.org**, you must supply your hostname, username for the service, and password. Number of retries defaults to **5**.

Default server settings

Set ip allocate-wan mode [normal | defaultserver]

Sets the WAN mode to direct your Gateway to forward all externally initiated IP traffic (TCP and UDP protocols only) to a default host on the LAN, otherwise this feature is disabled. Default is **normal**.

Link commands

links represent physical connections. Currently, port-based VLAN support is provided at this level.

set link name *name* type [ethernet | ppp]

Specifies whether the **type** of the **link** named *name* is **ethernet** or **ppp**.

set link name *name* igmp-snooping [off | on]

Turns **igmp-snooping off** or **on** on the **link** named *name*.

set link name *name* port-vlan ports [lan | ptm | vc-1 | vc-2]

Specifies a port-based VLAN on the selected ports on the **link** named *name*.

set link name *name* port-vlan priority [0 - 7]

Specifies the 802.1p priority bit. If you set this to a value greater than 0, all packets of this VLAN with unmarked priority bits (pbits) will be re-marked to this priority.

set link name *name* ppp sub-link *link_name*

Specifies a name ***link_name*** for this secondary link when one is required.

set link name *name* ppp auth-type [on | off]

Enables or disables PPP login authorization.

set link name *name* ppp username *uname*

Specifies a username ***uname*** for authentication on the specified link when **ppp auth-type** is set to **on**.

set link name *name* ppp password *pwd*

Specifies a password ***pwd*** for authentication on the specified link when **ppp auth-type** is set to **on**.

set link name *name* ppp magic-number [on | off]

Enables or disables LCP magic number negotiation.

set link name *name* ppp protocol-compression [off | on]

Specifies whether you want the Gateway to compress the PPP Protocol field when it transmits datagrams over the PPP link.

set link name *name* ppp max-failures *integer*

Specifies the maximum number of Configure-NAK messages the PPP module can send without having sent a Configure-ACK message. The ***integer*** argument can be any number between 1 and 20.

set link name *name* ppp max-configures *integer*

Specifies the maximum number of unacknowledged configuration requests that your Gateway will send. The ***integer*** argument can be any number between 1 and 20.

set link name *name* ppp max-terminates *integer*

Specifies the maximum number of unacknowledged termination requests that your Gateway will send before terminating the PPP link. The ***integer*** argument can be any number between 1 and 10.

set link name *name* ppp restart-timer *integer*

Specifies the number of seconds the Gateway should wait before retransmitting a configuration or termination request. The ***integer*** argument can be any number between 1 and 30.

set link name *name* ppp connection-type [instant-on | always-on]

Specifies whether a PPP connection is maintained by the Motorola® Gateway when it is unused for extended periods. If you specify ***always-on***, the Gateway never shuts down the PPP link. If you specify ***instant-on***, the Gateway shuts down the PPP link after the number of seconds specified in the time-out setting (below) if no traffic is moving over the circuit.

set link name *name* ppp echo-request [on | off]

Specifies whether you want your Gateway to send LCP echo requests. You should turn off LCP echoing if you do not want the Gateway to drop a PPP link to a nonresponsive peer.

set link name *name* ppp echo-failures *integer*

Specifies the maximum number of lost echoes the Gateway should tolerate before bringing down the PPP connection. The ***integer*** argument can be any number from between 1 and 20.

set link name *name* ppp echo-interval *integer*

Specifies the number of seconds the Gateway should wait before sending another echo from an LCP echo request. The ***integer*** argument can be any number from between 5 and 300 (seconds).

set link name *name* ppp mru *integer*

Specifies the Maximum Receive Unit (MRU) for the PPP interface. The ***integer*** argument can be any number between 128 and 1492 for PPPoE; 1500 otherwise.

set link name *name* ppp peer-dns [on | off]

Controls whether the Gateway accepts nameserver addresses from the peer.

- The default is **on**, which means the Gateway expects to get nameserver addresses when the PPP link comes up. This especially applies when the primary WAN connection is PPP.
- However, there are some unusual situations where the PPP connection is ***not*** the primary WAN, for example when the connection is used only for management. In that situation it may be desirable to ***not*** pick up more nameserver addresses. You can do that by setting the parameter to **off**.

NOTE:

This is an expert-mode setting that will rarely be used. The setting should be left **on**, unless you are an expert user who knows you do not want the Gateway to acquire any nameserver addresses from this PPP connection.

set link name *name* pppoe service-name *name*

Specifies an ISP name or a class or quality of service. The Service Name tells the access concentrator which network service the Motorola Gateway is trying to reach.

set link name *name* pppoe ac-name *name*

Specifies this particular Access Concentrator unit from all others.. Some access provider networks may have multiple PPPoE servers, and having the Motorola Gateway indicate an AC Name specifies to which one the Motorola Gateway is trying to connect.

Management commands

All management related items are grouped in this section.

set management account administrator username *username*

Specifies the **username** for the administrative user – the default is **admin**.

set management account user username *username*

Specifies the **username** for the non-administrative user – the default is **user**.

set management cwmp enable [off | on]

Turns **cwmp** (TR-069 CPE WAN Management Protocol) **on** or **off**. TR-069 allows a remote Auto-Config Server (ACS) to provision and manage the Motorola Gateway. TR-069 protects sensitive data on the Gateway by not advertising its presence, and by password protection.

set management cwmp acs-url *acs_url:port_number*

set management cwmp acs-username *acs_username*

set management cwmp acs-password *acs_password*

If TR-069 WAN side management services are enabled, specifies the auto-config server URL and port number. A username and password must also be supplied, if TR-069 is enabled.

The auto-config server is specified by URL and port number. The format for the ACS URL is as follows:

```
http://some_url.com:port_number
```

or

```
http://123.45.678.910:port_number
```

On units that support SSL, the format for the ACS URL can also be:

```
https://some_url.com:port_number
```

or

```
https://123.45.678.910:port_number
```

set management shell idle-timeout [1...120]

Specifies a timeout period of inactivity for telnet access to the Gateway, after which a user must re-login to the Gateway. Default is **15** minutes for telnet.

set management shell telnet-port [1 - 65534]

Specifies the port number for telnet (CLI) communication with the Motorola Gateway. Because port numbers in the range 0-1024 are used by other protocols, you should use numbers in the range 1025-65534 when assigning new port numbers to the Motorola Gateway telnet configuration interface. A setting of **0** (zero) will turn the server off.

set management web http-port [1 - 65534]

Specifies the port number for HTTP (web) communication with the Motorola Gateway. Because port numbers in the range 0-1024 are used by other protocols, you should use numbers in the range 1025-65534 when assigning new port numbers to the Motorola Gateway web configuration interface. A setting of **0** (zero) will turn the server off.

set management web idle-timeout [1...120]

Specifies a timeout period of inactivity for HTTP access to the Gateway, after which a user must re-login to the Gateway. Default is **5** minutes for HTTP.

NOTE:

You cannot specify a port setting of **0** (zero) for both the web and telnet ports at the same time. This would prevent you from accessing the Gateway.

Remote access commands

set management remote-access http-port [1 - 65534]

Sets the web access port for remote access management of the Gateway. Default is port **51003.**

set management remote-access http-idle-timeout [1...120]

Specifies a timeout period of inactivity for remote HTTP access to the Gateway, after which a user must re-login to the Gateway. Default is **20** minutes for HTTP.

set management remote-access http-total-timeout [1...120]

Specifies a total timeout period of inactivity for remote HTTP access to the Gateway, after which a user must re-login to the Gateway. Default is **20** minutes for HTTP.

set management remote-access http-max-clients *number*

Specifies the maximum number of client sessions for remote web access management. Defaults to 1 (one).

set management remote-access https-port [1 - 65534]

Sets the secure web access port for remote access management of the Gateway. Default is port **51443.**

set management remote-access https-idle-timeout [1...120]

Specifies a timeout period of inactivity for secure remote HTTPS access to the Gateway, after which a user must re-login to the Gateway. Default is **20** minutes for HTTPS.

set management remote-access https-total-timeout [1...120]

Specifies a total timeout period of inactivity for secure remote HTTPS access to the Gateway, after which a user must re-login to the Gateway. Default is **20** minutes for HTTPS.

set management remote-access https-max-clients *number*

Specifies the maximum number of client sessions for secure remote web access management. Defaults to 1 (one).

set management remote-access telnet-port [1 - 65534]

Specifies the port number for remote access telnet (CLI) communication with the Motorola Gateway. Because port numbers in the range 0-1024 are used by other protocols, you should use numbers in the range 1025-65534 when assigning new port numbers to the Motorola Gateway telnet configuration interface. A setting of **0** (zero) will turn the server off. Defaults to port **23**.

set management remote-access telnet-idle-timeout [1...120]

Specifies a timeout period of inactivity for remote telnet access to the Gateway, after which a user must re-login to the Gateway. Default is **5** minutes for telnet.

set management remote-access telnet-total-timeout [1...120]

Specifies a total timeout period of inactivity for remote telnet access to the Gateway, after which a user must re-login to the Gateway. Default is **20** minutes for telnet.

set management remote-access telnet-max-clients *number*

Specifies the maximum number of client sessions for remote telnet access management. Defaults to **4**.

set management remote-access ssh-port [1 - 65534]

Specifies the port number for secure shell (SSH) communication with the Motorola Gateway. Defaults to port **22**.

set management remote-access ssh-idle-timeout [1...120]

Specifies a timeout period of inactivity for remote secure shell (SSH) access to the Gateway, after which a user must re-login to the Gateway. Default is **5** minutes for SSH.

set management remote-access ssh-total-timeout [1...120]

Specifies a total timeout period of inactivity for remote secure shell (SSH) access to the Gateway, after which a user must re-login to the Gateway. Default is **20** minutes for SSH.

set management remote-access ssh-max-clients *number*

Specifies the maximum number of client sessions for remote secure shell (SSH) access management. Defaults to **4**.

set management lan-redirect enable [off | on]

If set to **on**, if a WAN failure condition is detected, the LAN client's browser is redirected to a web page of failure and help text information. The redirect will only occur once, as the web UI maintains a state variable to determine whether the redirect has occurred; to continually redirect would block the user from reconfiguring the router.

set management lan-access wan-cpe-mgmt-block [off | web | all]

Blocks management of the device from the LAN via the web or all interface(s).

TR-064

DSL Forum LAN Side CPE Configuration (TR-064) is an extension of UPnP. It defines more services to locally manage the Motorola® Gateway. While UPnP allows open access to configure the Gateway's features, TR-064 requires a password to execute any command that changes the Gateway's configuration.

set management lanmgmt enable [off I on]

Turns TR-064 LAN side management services on or off. The default is **off.**

Physical interfaces commands

DSL interfaces

set physical dsl enable [off | on]

Turns the physical DSL interface **off** or **on**. Default is **on**.

set physical dsl loopback [off | on]

Turns the DSL loopback mode **off** or **on**. Default is **off**.

set physical dsl modulation auto [off | on]

Turns automatic DSL modulation **off** or **on**. Default is **on**.

set physical dsl transport [atm | ptm | auto | off]

Sets the DSL transport mode: Asynchronous (**atm**), Packet (**ptm**), Automatic (**auto**), or none (**off**). Default is **auto**.

set physical dsl atm vcc 1 enable [off | on]

Turns **atm** on or off on vcc 1. Default is **on**.

set physical dsl atm vcc 1 aal-type [aal5 | aal0pkt | aal0cell]

Sets the ATM Adaptation Layer type (**aal-type**): AAL5, AAL0-packet, or AAL0-cell. Default is **aal5**.

set physical dsl atm vcc 1 datapath [phy0fast | phy0interleaved]

Sets the ATM datapath, Fast Path or Interleaved. Default is **phy0fast**.

set physical dsl atm vcc 1 encap-type [llcsnap-eth | llcsnap-rtip | llcencaps-ppp | vcmux-eth | vcmux-ipoa | vcmux-pppoa]

Specifies the data link encapsulation type. Default is **llcsnap-eth**.

set physical dsl atm vcc 1 vpi [0 - 255]

Sets the Virtual Path Identifier (**vpi**) for the circuit. Default is **0**.

set physical dsl atm vcc 1 vci [32 - 65535]

Sets the Virtual Channel Identifier (**vci**) for the circuit. Default is **35**.

set physical dsl atm vcc 2 enable [off | on]

Turns **atm** on or off on vcc 2. Default is **on**.

set physical dsl atm vcc 2 aal-type [aal5 | aal0pkt | aal0cell]

Sets the ATM Adaptation Layer type (**aal-type**): AAL5, AAL0-packet, or AAL0-cell. Default is **aal5**.

set physical dsl atm vcc 2 datapath [phy0fast | phy0interleaved]

Sets the ATM datapath, Fast Path or Interleaved. Default is **phy0fast**.

set physical dsl atm vcc 2 encap-type [llcsnap-eth | llcsnap-rtip | llcencaps-ppp | vcmux-eth | vcmux-ipoa | vcmux-pppoa]

Specifies the data link encapsulation type. Default is **llcsnap-eth**.

set physical dsl atm vcc 2 vpi [0 - 255]

Sets the Virtual Path Identifier (**vpi**) for the circuit. Default is **8**.

set physical dsl atm vcc 2 vci [32 - 65535]

Sets the Virtual Channel Identifier (**vci**) for the circuit. Default is **35**.

set physical dsl atm vcc *vcc_num* tx-queue *queue_name*

Attaches the egress queue template to the atm vc when the queue type is egress.

set physical dsl atm vcc *vcc_num* rx-queue *queue_name*

Attaches the ingress queue to the atm vc when the queue type is ingress.

set physical dsl ptm datapath [phy0fast | phy0interleaved]

Sets the ATM datapath, Fast Path or Interleaved. Default is **phy0fast**.

set physical dsl ptm priority [low | high]

Sets the Packet Transfer Mode (**ptm**) priority. Default is **low**.

set physical dsl ptm tx-queue *queue_name*

Attaches the egress queue template to the ptm interface when the queue type is egress.

set physical dsl ptm rx-queue *queue_name*

Attaches the ingress queue to the ptm interface when the queue type is ingress.

set physical enet *enet_num* tx-queue *queue_name*

Attaches the egress queue template to the ethernet interface when the queue type is egress.

set physical enet *enet_num* rx-queue *queue_name*

Attaches the ingress queue to the ethernet interface when the queue type is ingress.

set physical dsl power-save enable [off | on]

Turns power saving mode off or on. Default is **off**.

Ethernet interfaces

set physical enet 1 mac-addr-override *mac_addr*

You can override your Gateway's Ethernet MAC address with any necessary setting. Some ISPs require your account to be identified by the MAC address, among other things. Enter your 12-character Ethernet MAC override address as instructed by your service provider, for example: 12 34 AB CD 19 64

set physical enet 1 port media [auto | 100-fd | 100-hd | 10-fd | 10-hd]

Sets the Ethernet port's media flow control: Automatic, 100 Mbps Full-Duplex, 100 Mbps Half-Duplex, 10 Mbps Full-Duplex, or 10 Mbps Half-Duplex. Default is **auto**.

set physical enet 1 port mdix [auto | on | off]

Sets the Ethernet port's crossover detection. Default is **off**.

Wireless interfaces

set physical wireless enable [on | off]

Enables or disables the wireless capability for supported Wi-Fi Gateways. Default is **on**.

set physical wireless standard [bg | b-only | g-only | bgn | n-only | an | a-only]

Sets and locks the Gateway into the wireless transmission mode you want: **bg**, **b-only**, **g-only**, **bgn**, **n-only**, **an**, or **a-only**. For compatibility with clients using 802.11b (up to 11 Mbps transmission), 802.11g (up to 20+ Mbps), 802.11a (up to 54 Mbit/s using the 5 GHz band), or 802.11n (from 54 Mbit/s to 600 Mbit/s with the use of four spatial streams at a channel width of 40 MHz), select **B/G/N**. To limit your wireless LAN to one mode or the other, select **G-only**, **N-only**, **A-only**, or **B-only**, or some combination that applies to your setup. Default is **bgn**.

set physical wireless auto-channel [off | on]

Turns auto-channel detection **on** or **off**.

set physical wireless default-channel [1... 11]

(1 through 11, for North America) on which the network will broadcast. This is a frequency range within the 2.4Ghz band. Channel selection depends on government regulated radio frequencies that vary from region to region. The widest range available is from 1 to 14. Europe, France, Spain and Japan differ. Channel selection can have a significant impact on performance, depending on other wireless activity close to this Router. Channel selection is not necessary at the client computers; the clients will scan the available channels seeking access points using the same SSID as the client. Defaults to **6**.

set physical wireless power [1 - 100]

Sets some value lower than 100 percent transmit power if your Gateway is located close to other Wi-Fi Gateways and causes interference. Defaults to **100** (percent).

set physical wireless ssid 1 enable [on | off]

Enables or disables the first (default) Wi-Fi SSID.

set physical wireless ssid 1 name *name*

Specifies a name for the first Wi-Fi SSID. Defaults to a unique value per router.

set physical wireless ssid 1 access-type [none | allow | deny]

Specifies the type of address list for defining MAC address filtering. If set to **allow**, only hosts with the specified addresses will be permitted to join the WLAN of the specified SSID. If set to **deny**, any hosts except those with the specified addresses will be permitted to join the specified SSID. Default is **none**.

set physical wireless ssid 1 access-list *mac_address*

Specifies the MAC address of devices controlled by MAC address filtering.

set physical wireless ssid 1 hidden [off | on]

Enables or disables "closed system mode" for the specified SSID. If set to **on**, the specified SSID will not appear on client scans. Clients must log into the SSID with the exact SSID name and credentials specified for that SSID.

set physical wireless ssid 1 isolate [off | on]

If set to **on**, blocks wireless clients from communicating with other wireless clients on the LAN side of the Gateway. Defaults to **off**.

set physical wireless ssid 1 security [none | wep | wpa]

Sets the wireless privacy type: **none**, **wep**, or **wpa-psk**. Default is **none**.

set physical wireless ssid 2 enable [off | on]

Enables or disables the second available SSID.

set physical wireless ssid 3 enable [off | on]

Enables or disables the third available SSID.

set physical wireless ssid 4 enable [off | on]

Enables or disables the fourth available SSID.

set physical wireless wps [on | off]

Enables or disables Wi-Fi Protected Setup (WPS) for simplified security configuration with Wi-Fi clients that support it.

set physical wireless wmm enable [off | on]

Enables or disables Wi-Fi Multimedia settings for multimedia queueing characteristics.

PPPoE relay commands

set pppoe-relay enable [on | off]

Allows the Gateway to forward PPPoE packets. Default is **on**.

set pppoe-relay max-sessions [0... 4]

Specifies the maximum number of PPPoE relay sessions. Default is **4**.

NAT Pinhole commands

NAT pinholes let you pass specific types of network traffic through the NAT interfaces on the Motorola Gateway. NAT pinholes allow you to route selected types of network traffic, such as FTP requests or HTTP (Web) connections, to a specific host behind the Motorola Gateway transparently.

To set up NAT pinholes, you identify the type(s) of traffic you want to redirect by port number, and you specify the internal host to which each specified type of traffic should be directed.

The following list identifies protocol type and port number for common TCP/IP protocols:

- FTP (TCP 21)
- telnet (TCP 23)
- SMTP (TCP 25),
- TFTP (UDP 69)

set pinhole name *name* protocol [tcp | udp]

Specifies the identifier for the entry in the Gateway's pinhole table. You can name pinhole table entries sequentially (1, 2, 3), by port number (21, 80, 23), by protocol, or by some other naming scheme. Specifies the type of protocol being redirected.

set pinhole name *name* ext-port-range [0 - 49151]

Specifies the first and last port number in the range being translated.

set pinhole name *name* int-addr *ipaddr*

Specifies the IP address of the internal host to which traffic of the specified type should be transferred.

set pinhole name *name* int-start-port [0 - 65535]

Specifies the port number your Motorola Gateway should use when forwarding traffic of the specified type. Under most circumstances, you would use the same number for the external and internal port.

Security Stateful Packet Inspection (SPI) commands

set security firewall-level [low | high | off]

All computer operating systems are vulnerable to attack from outside sources, typically at the operating system or Internet Protocol (IP) layers. Stateful Inspection firewalls intercept and analyze incoming data packets to determine whether they should be admitted to your private LAN, based on multiple criteria, or blocked. Stateful inspection improves security by tracking data packets over a period of time, examining incoming and outgoing packets. Outgoing packets that request specific types of incoming packets are tracked; only those incoming packets constituting a proper response are allowed through the firewall.

The **high** setting is recommended, but for special circumstances, a **low** level of firewall protection is available. You can also turn all firewall protection **off**. Defaults to **low**.

set security spi invalid-address-drop [on | off]

Enables or disables whether Broadband packets with invalid source or destination addresses should be dropped. Default is **on**.

set security spi unknown-ethertypes-drop [on | off]

Enables or disables whether packets with unknown ether types are to be dropped. Default is **on**.

set security spi portscan-protect [on | off]

Enables or disables whether to detect and drop port scans. Default is **on**.

set security spi invalid-tcp-flags-drop [on | off]

Enables or disables whether packets with invalid TCP flag settings (NULL, FIN, Xmas, etc.) are to be dropped. Default is **on**.

set security spi flood-limit enable [on | off]

Enables or disables whether packet flooding should be detected and offending packets be dropped. Default is **on**.

set security spi flood-limit limit *pps_value*

Sets a maximum Packets Per Second (PPS) value for packet flood criterion.

set security spi flood-limit burst-limit *max_value*

Sets a maximum value in a packet-burst for packet flood criterion.

VoIP commands

(supported models only}

Voice-over-IP (VoIP) refers to the ability to make voice telephone calls over the Internet. This differs from traditional phone calls that use the Public Switched Telephone Network (PSTN). VoIP calls use an Internet protocol, Session Initiation Protocol (SIP), to transmit sound over a network or the Internet in the form of data packets. Certain Motorola Gateway models have one or more voice ports for connecting telephone handsets. These models support VoIP. If your Gateway is a VoIP model, you can configure the VoIP features.

set voip phone *n* sip-option [off | on]

Turns SIP on or off for the phone specified by ***n***, usually **1** or **2**, depending on your Gateway's number of physical voice ports. Default is **off**.

set voip phone *n* sip-proxy-server [*server_name* l *ip_address*]

Specifies the SIP proxy server for the specified phone by fully qualified server name or IP address.

set voip phone *n* sip-proxy-server-port [1 - 65535]

Specifies the SIP proxy server port number for the specified phone. Default is **5060**.

set voip phone *n* sip-proxy-server-transport [udp | tcp]

Specifies the SIP proxy server transport protocol for the specified phone. Default is **UDP**.

set voip phone *n* sip-registrar-server [*server_name* l *ip_address*]

Specifies the SIP registration server for the specified phone by fully qualified server name or IP address.

set voip phone *n* sip-registrar-server-port [1 - 65535]

Specifies the SIP registration server port number for the specified phone. Default is **5060**.

set voip phone *n* sip-registrar-server-transport [udp | tcp]

Specifies the SIP registration server transport protocol for the specified phone. Default is **UDP**.

set voip phone *n* sip-expires-time [5 - 65535]

Specifies the SIP registration server time-out duration from 0 – 65535 seconds for the specified phone. Default is **3600** (1 hour).

set voip phone *n* sip-outproxy-server [*server_name* I *ip_address*]

Specifies the SIP outbound proxy server for the specified phone by fully qualified server name or IP address.

set voip phone *n* sip-outproxy-server-port [1 - 65535]

Specifies the SIP outbound proxy server port for the specified phone. Default is **5060**.

set voip phone *n* sip-user-display-name *name*

Specifies the user name that is displayed on the web UI Home page, or other caller-id displays for the specified phone.

set voip phone *n* sip-user-name *username*

Specifies the user name that authenticates the user to SIP for the specified phone.

set voip phone *n* sip-user-password *password*

Specifies the password that authenticates the user to SIP for the specified phone.

set voip phone *n* auth-id *string*

Specifies the authorization ID that authenticates the user to SIP for the specified phone. Most SIP Servers expect this to be the username itself but some may use **auth-id**.

set voip phone *n* sip-user-port [1 - 65535]

Specifies the SIP user port for the specified phone, Default is **5060**.

set voip phone *n* codec G711U priority [1 | 2 | 3 | 4 | 5 | 6 | 7 | none]

Assigns a priority to the ***ulaw*** codec, the common analog voice encoding method used in North America.

set voip phone *n* codec G711A priority [1 | 2 | 3 | 4 | 5 | 6 | 7 | none]

Assigns a priority to the ***alaw*** codec, the common analog voice encoding method used outside North America.

set voip phone *n* codec G729 priority [1 | 2 | 3 | 4 | 5 | 6 | 7 | none]

Assigns a priority to the ***G729 annex A*** codec, the common analog voice compression implementation used in North America.

set voip phone *n* codec G726_16 priority [1 | 2 | 3 | 4 | 5 | 6 | 7 | none]

Assigns a priority to the ***G726-16*** codec, a common audio media type implementation at 16 kbit/s.

set voip phone *n* codec G726_24 priority [1 | 2 | 3 | 4 | 5 | 6 | 7 | none]

Assigns a priority to the ***G726-24*** codec, a common audio media type implementation at 24 kbit/s.

set voip phone *n* codec G726_32 priority [1 | 2 | 3 | 4 | 5 | 6 | 7 | none]

Assigns a priority to the ***G726-32*** codec, a common audio media type implementation at 32 kbit/s.

set voip phone *n* codec G726_40 priority [1 | 2 | 3 | 4 | 5 | 6 | 7 | none]

Assigns a priority to the ***G726-40*** codec, a common audio media type implementation at 40 kbit/s.

Advanced settings

set voip phone *n* sip-advanced-setting sip-dtmf-mode [inband | rfc2833 | info]

sip-dtmf-mode – sets the Dual Tone Multi-Frequency Mode:

- **inband**: sends the DTMF digits as a normal inband tone.
- **rfc2833**: (default) sends the DTMF digits as an event as part of the RTP packet header information.
- **info**: sends the DTMF digits in the SIP INFO message.

set voip phone *n* sip-advanced-setting sip-hk-flash-mode [cpe | info]

Sets the behavior of the flash hook mode for the specified phone line. Default is **info**.

set voip phone *n* sip-advanced-setting sip-session-refresher [local | remote | auto]

Sets the method for refreshing the SIP session. Default is **auto**.

set voip phone *n* sip-advanced-setting sip-dynamic-payload [96 - 110]

Specifies a default dynamic payload value for a named telephony event. Default is **101**.

set voip phone *n* sip-advanced-setting sip-digit-map *string*

Specifies rules used to recognize a number dialed by the user and to ensure this number matches the dial plan defined by the ITSP**.**

set voip phone *n* sip-advanced-setting sip-compact-header [off | on]

Forces all headers in the message to use compact format when set to **on**. Sends the SIP messages with Compact Headers, reducing the size of the SIP messages.

set voip phone *n* sip-advanced-setting sip-q-value [0 - 10]

This is used to prioritize the SIP account based on the value.

set voip phone *n* sip-advanced-setting sip-qos-tos-value [0 - 255]

Specifies the SIP Diff-Serv Type of Service (ToS) values for Quality of Service (QoS) assignment. Default is **136**.

set voip phone *n* sip-advanced-setting sip-qos-p-bit-value [0 - 7]

Sets a QoS P-bit value for the SIP session. Default is **6**.

set voip phone *n* sip-advanced-setting sip-qos-marker-value *value*

Sets a QoS marker on the SIP session packets on the specified phone line.

set voip phone *n* sip-advanced-setting rtp-qos-tos-value [0 - 255]

Specifies the RTP Diff-Serv Type of Service (ToS) values for Quality of Service (QoS) assignment. Default is **184**.

set voip phone *n* sip-advanced-setting rtp-qos-p-bit-value [0 - 7]

Sets a QoS P-bit value for the RTP session. Default is **6**..

set voip phone *n* sip-advanced-setting rtp-qos-marker-value *value*

Sets a QoS marker on the RTP session packets on the specified phone line.

set voip phone *n* sip-advanced-setting fax-redundancy-level [0 - 1]

Specifies the level of fax redundancy for t38 fax data rate management.

set voip phone *n* sip-advanced-setting sip-init-de-register [off | on]

Turns SIP de-registration on or off. Default is **off**.

set voip phone *n* sip-advanced-setting sip-known-ip-list *string*

Specifies a known IP address list of SIP servers for the SIP session.

Advanced telephony settings

The telephony features include advanced settings for fine tuning phone behavior. The following codecs and associated ***value*** defaults are supported:

	Codec G711U	Codec G711A	Codec G729	Codec G726_16
packetization-time	20	20	20	20
jitter-max-reorder-delay	50	50	50	50
jitter-max-accept-late-seq-num	200	200	200	200
jitter-initial-delay	80	80	80	80
jitter-exe-frame-del-mode	off	off	off	off
jitter-max-transit-delay	250	250	250	250
jitter-peak-transit-delay	475	475	475	475
jitter-delay-buff-inc	10	10	10	10
jitter-transit-delay-threshold	10000	10000	10000	10000

	Codec G726_24	Codec G726_32	Codec G726_40
packetization-time	20	20	20
jitter-max-reorder-delay	50	50	50
jitter-max-accept-late-seq-num	200	200	200
jitter-initial-delay	80	80	80
jitter-exe-frame-del-mode	off	off	off
jitter-max-transit-delay	250	250	250
jitter-peak-transit-delay	475	475	475
jitter-delay-buff-inc	10	10	10
jitter-transit-delay-threshold	10000	10000	10000

Syntax is as follows:

set voip advanced-telephony-setting codec *codec* **packetization-time** *value*

set voip advanced-telephony-setting codec *codec* **jitter-max-reorder-delay** *value*

set voip advanced-telephony-setting codec *codec*
jitter-max-accept-late-seq-num *value*

set voip advanced-telephony-setting codec *codec* **jitter-initial-delay** *value*

set voip advanced-telephony-setting codec *codec* **jitter-exe-frame-del-mode**
[off | on]

set voip advanced-telephony-setting codec *codec* **jitter-max-transit-delay** *value*

set voip advanced-telephony-setting codec *codec* **jitter-peak-transit-delay** *value*

set voip advanced-telephony-setting codec *codec* **jitter-delay-buff-inc** *value*

set voip advanced-telephony-setting codec *codec*
jitter-transit-delay-threshold *value*

set voip advanced-telephony-setting fxs-port-setting-for-fxo
[none | fxs1 | fxs2 | both | emgncy]

Sets a port to be used for the FXS (Foreign eXchange Subscriber interface) port to the FXO (Foreign eXchange Office interface -- the phone) port. Default is **none**,

set voip advanced-telephony-setting rtp-port-range-start *value*
set voip advanced-telephony-setting rtp-port-range-end *value*

Sets the start and end port values for the RTP port range. Although no ports are specified for the RTP protocol, the RTP data is to be carried on an even UDP port number. The defaults in use for the Motorola Gateway are **8024** and **8036**, respectively.

set voip advanced-telephony-setting rtcp-option [off | on]

Turns Real-Time Transport Control Protocol on or off. RTCP supports and controls RTP media streams, but does not itself deliver media streams. Default is **off**.

set voip advanced-telephony-setting t38-option [off | on]

Turns T.38 fax capability on or off. Default is **off**.

set voip advanced-telephony-setting sip-session-timer-value *seconds*

Sets a timer in seconds for SIP sessions to periodically verify that an established session is still active. Default is **2280**.

set voip advanced-telephony-setting sip-t1-timer-value *milliseconds*

Sets a SIP T1 timer value, an estimate of the round trip time, in milliseconds from 100 – 5000. Default is **500**.

set voip advanced-telephony-setting sip-dynamic-line-selection [off | on]

Turns dynamic (next available) line selection off or on. Default is **off**.

set voip RegionSpecificSettings Region-Code *region_code*

Specifies the set of standards in use for the geographical region. Example: "USA_DEFAULT".

set voip RegionSpecificSettings fxs-hook-flash-min-time *seconds*

Specifies the minimum Foreign Exchange Station (FXS) hookflash time in seconds. Default is **280**.

set voip RegionSpecificSettings fxs-hook-flash-max-time *seconds*

Specifies the maximum Foreign Exchange Station (FXS) hookflash time in seconds. Default is **1100**.

set voip RegionSpecificSettings fxs-debounce-onoff-hook-delay *seconds*

Specifies the on/off-hook debounce time delay for removing the ripple signal, in seconds. Default is **100**.

set voip RegionSpecificSettings fxs-debounce-offon-hook-delay *seconds*

Specifies the off/on-hook debounce time delay for removing the ripple signal, in seconds. Default is **300**.

Call feature settings

set voip phone *n* call-feature call-forwarding-all-option [off | on]

call-forwarding-all-option – turns unconditional call forwarding **on** or **off**.

set voip phone *n* call-feature call-forwarding-on-busy-option [off | on]

call-forwarding-on-busy-option – turns call forwarding when line is busy **on** or **off**.. Default is **off**.

set voip phone *n* call-feature call-forwarding-on-no-answer-option [off | on]

call-forwarding-on-no-answer-option – turns call forwarding when there is no answer **on** or **off**.

set voip phone *n* call-feature call-waiting-option [off | on]

call-waiting-option – enables or disables call waiting.

set voip phone *n* call-feature call-conferencing-option [off | on]

call-conferencing-option – enables or disables 3-way call conferencing.

set voip phone *n* call-feature do-not-disturb-option [off | on]

do-not-disturb-option – enables or disables option to prevent the phone from ringing.

set voip phone *n* call-feature subscribe-mwi-option [off | on]

subscribe-mwi-option – if set to **on**, the Message Waiting Indicator is enabled when new voice mail is received.

set voip phone *n* call-feature anonymous-call-block-option [off | on]

anonymous-call-block-option – if set to **on**, blocks calls from unidentified sources, such as those with caller-ID blocking.

set voip phone *n* call-feature call-transfer-option [off | on]

call-transfer-option – if set to **on**, permits call transfer to another phone.

DSP settings

set voip phone *n* dsp-settings echo-option [echo-off | echo-on | echo-on-nlp | echo-on-cng-nlp]

echo-option – specifies under what conditions the system invokes or disables echo cancellation. Default is **echo-on-cng-nlp** (Comfort Noise Generation with non-linear processor).

set voip phone *n* dsp-settings echo-start-attenuation [0 - 65535]

echo-start-attenuation – specifies the minimum attenuation level at which to invoke echo cancellation. Default is **8192**.

set voip phone *n* dsp-settings echo-max-attenuation [0 - 65535]

echo-max-attenuation – specifies the maximum attenuation level at which to invoke echo cancellation. Default is **16384**.

set voip phone *n* dsp-settings echo-tail-length [0 - 65535]

echo-tail-length – specifies the duration of an echo tail required to invoke cancellation. Default is **0**.

set voip phone *n* dsp-settings vad-option [off | on]

When **vad-option** is set to **on** – enables Voice Activity Detection/Comfort Noise Generation. When speech is not present, the CNG algorithm generates a noise signal at the level sent from the transmit side.

System commands

set system name *name*

Specifies the name of your Motorola Gateway. Each Motorola Gateway is assigned a name as part of its factory initialization. The default name for a Motorola Gateway consists of the word "Motorola-7000/XXX" where "XXX" is the serial number of the device; for example, Motorola-7000/9437188. A system name can be 1 – 255 characters long. Once you have assigned a name to your Motorola Gateway, you can enter that name in the Address text field of your browser to open a connection to your Motorola Gateway.

NOTE:

Some broadband cable-oriented Service Providers use the **System Name** as an important identification and support parameter. If your Gateway is part of this type of network, do **NOT** alter the System Name unless specifically instructed by your Service Provider.

set system time-zone [UTC | HST10 | AKST9AKDT | YST8 | PST8PDT | MST7MDT | MST7 | CST6CDT | CST6 | EST5EDT | AST4ADT | NST3:30NDT]

time-zone of 0 is Coordinated Universal Time (UTC); options are -12 through 12 (+/- 1 hour increments from UTC time).

set system auto-daylight-savings [on | off]

Time zones honoring Daylight Saving Time may be automatically designated.

set system firewall-log enable [on | off]

Turns firewall logging on or off. The firewall log tracks attempted violations of the firewall rules. Default is **on**.

set system firewall-log file-size [4096... 65536]

Specifies a size for the firewall logs. The most recent entries are posted to the beginning of the log. When the log becomes full, the oldest entries are dropped. The default is 16384.

set system firewall-log file-count [2... 8]

Specifies the number of possible log files. The default is 4.

set system log buffer-size [4096... 65536]

Specifies a size for the system log. The most recent entries are posted to the beginning of the log. When the log becomes full, the oldest entries are dropped. The default is 16384.

set system log level [low | medium | high | alerts | failures]

Specifies the types of log messages you want the Motorola Gateway to record. All messages with a level equal to or greater than the level you specify are recorded. For example, if you specify set system diagnostic-level **medium**, the diagnostic log will retain medium-level informational messages, alerts, and failure messages.

Use the following guidelines:

- **low** - Low-level informational messages or greater; includes trivial status messages.
- **medium** - Medium-level informational messages or greater; includes status messages that can help monitor network traffic.

- **high** - High-level informational messages or greater; includes status messages that may be significant but do not constitute errors. The default.
- **alerts** - Warnings or greater; includes recoverable error conditions and useful operator information.
- **failures** - Failures; includes messages describing error conditions that may not be recoverable.

Debug Commands

When you are in SHELL mode, the DEBUG prompt is the name of the Motorola Gateway/DEBUG followed by a right angle bracket (>). For example, if you open a CLI connection to the Motorola Gateway named “Motorola-3000/9437188,” then type “debug” you would see ***Motorola-3000/9437188/DEBUG>*** as your prompt.

Debug level is available for field debugging purposes.There is no service and quality level guarantee from Motorola. This level is intended for SEs or Telcos lab people, not for normal operation at home for end users.

Disclaimer & Warning Text

The following is displayed when entering Debug level from normal Config level.

“Warning: Accessing these commands may impact the normal operation of this device. Exit now if you entered by mistake”

Commands

console

Make this session the console.

mirror <src-port> <dst-port>

To mirror one port's traffic to another. Causes traffic transmitted or received on <src-port> to be mirrored on <dst-port>. Ports must support Ethernet (IPoA and PPPoA ATM ports are not supported).

mirror off

Turns off port mirroring.

trace

To see the "trace" messages, first enable console. Toggles routing tracing for:

arp					
dhcp	server	agent	client		
bridge					
dns					
dyndns					
fw					
http	server	client	shell	stcp	tls
igmp	proxy	snooping			
ip					
ipesp					
ipmap					
ipsec					
key					
pptp					
rip					
tftp					
sip					

wireless

voip sip dsp

CHAPTER 5 Technical Specifications and Safety Information

Description

Dimensions:
(Unit without the stand) H: 194 mm, W: 32 mm, D: 148 mm, Weight: 403 grams

(Unit with the stand) H: 210 mm, W: 77 mm, D: 166 mm, Weight: 449 grams

Communications interfaces: The Motorola® Gateways have an RJ-11 jack for DSL line connections and a 4-port 10/100Base-T Ethernet switch for your LAN connections, and a 400 mW wireless radio for Wi-Fi connections.

Power requirements

- Min10.5W/110VAC
- Max17.2W/110AC
- Min 8.4W/12VDC@2A
- Max 14.4W/12VDC@2A (2phone,5REN, RINGING)

Environment

Operating temperature: 0° to +40° C

Storage temperature: 0° to +70° C

Relative storage humidity: 20 to 80% noncondensing

Software and protocols

Software media: Software preloaded on internal flash memory; field upgrades done via download to internal flash memory via CLI or web upload.

Routing: TCP/IP Internet Protocol Suite, RIP

WAN support: PPPoA, PPPoE, DHCP, static IP address

Security: PAP, CHAP, UI password security, IPsec

Management/configuration methods: HTTP (Web server), telnet command line interface

Diagnostics: Ping, event logging, routing table displays, statistics counters, web-based management, traceroute, nslookup, and diagnostic commands.

Agency approvals

North America

Safety Approvals:

- United States – UL 60950, Third Edition
- Canada – CSA: CAN/CSA-C22.2 No. 60950-00

EMC:

- United States – FCC Part 15 Class B
- Canada – ICES-003

Telecom:

- United States – 47 CFR Part 68
- Canada – CS-03

Manufacturer’s Declaration of Conformance

Warnings:

This is a Class B product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures. Adequate measures include increasing the physical distance between this product and other electrical devices.
Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

United States. 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 instructions, 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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Service requirements. In the event of equipment malfunction, if under warranty we will exchange a product deemed defective. Under FCC rules, no customer is authorized to repair this equipment. This restriction applies regardless of whether the equipment is in or out of warranty.
Technical Support for Hardware Products
1-877-466-8646
http://www.motorola.com/support

Important

This product was tested for FCC compliance under conditions that included the use of shielded cables and connectors between system components. Changes or modifications to this product not authorized by the manufacturer could void your authority to operate the equipment.

Canada. This Class B digital apparatus meets all requirements of the Canadian Interference -Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Declaration for Canadian users

NOTICE: The Canadian Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation, and safety requirements. The Department does not guarantee the equipment will operate to the user’s satisfaction.

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. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to the certified equipment should be made by an authorized Canadian maintenance facility 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.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Important Safety Instructions

Caution

DO NOT USE BEFORE READING THE INSTRUCTIONS: Do not connect the Ethernet ports to a carrier or carriage service provider’s telecommunications network or facility unless: a) you have the written consent of the network or facility manager, or b) the connection is in accordance with a connection permit or connection rules.

Connection of the Ethernet ports may cause a hazard or damage to the telecommunication network or facility, or persons, with consequential liability for substantial compensation.

Caution

- The direct plug-in power supply serves as the main power disconnect; locate the direct plug-in power supply near the product for easy access.
- For use only with CSA Certified Class 2 power supply, rated 12VDC, 1.0A.

Telecommunication installation cautions

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

47 CFR Part 68 Information

FCC Requirements

1. The Federal Communications Commission (FCC) has established Rules which permit this device to be directly connected to the telephone network. Standardized jacks are used for these connections. This equipment should not be used on party lines or coin phones.
2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service.
3. The telephone company may make changes in its technical operations and procedures; if such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes. You will be advised of your right to file a complaint with the FCC.
4. If the telephone company requests information on what equipment is connected to their lines, inform them of:

   a. The telephone number to which this unit is connected.

   b. The ringer equivalence number. [0.XB]

   c. The USOC jack required. [RJ11C]

   d. The FCC Registration Number. [XXXUSA-XXXXX-XX-E]

   Items (b) and (d) are indicated on the label. The Ringer Equivalence Number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the REN's of all devices on any one line should not exceed five (5.0). If too many devices are attached, they may not ring properly.

FCC Statements

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

b) List all applicable certification jack Universal Service Order Codes ("USOC") for the equipment: RJ11.

c) 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. See installation instructions for details.

d) The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (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. For products approved after July 23, 2002, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

e) If this equipment, the Motorola® 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 isn't 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.

f) 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.

g) If trouble is experienced with this equipment, the Motorola® Gateway, for warranty information, please contact:

Technical Support for Hardware Products
1-877-466-8646
http://www.motorola.com/support

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.

h) This equipment not intended to be repaired by the end user. In case of any problems, please refer to the troubleshooting section of the Product User Manual before calling Motorola Technical Support.

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

j) If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this Motorola$^{®}$ Series Gateway does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or qualified installer.

RF Exposure Statement:

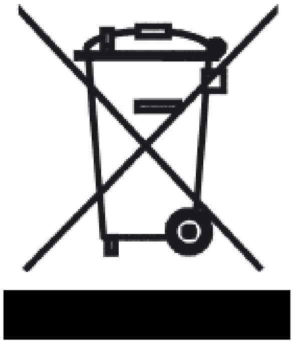
NOTE: Installation of the wireless models must maintain at least 20 cm between the wireless Gateway and any body part of the user to be in compliance with FCC RF exposure guidelines.

Electrical Safety Advisory

Telephone companies report that electrical surges, typically lightning transients, are very destructive to customer terminal equipment connected to AC power sources. This has been identified as a major nationwide problem. Therefore it is advised that this equipment be connected to AC power through the use of a surge arrestor or similar protection device.

Caring for the Environment by Recycling

When you see this symbol on a Motorola product, do not dispose of the product with residential or commercial waste.



Recycling your Motorola Equipment

Please do not dispose of this product with your residential or commercial waste. Some countries or regions, such as the European Union, have set up systems to collect and recycle electrical and electronic waste items. Contact your local authorities for information about practices established for your region.

If collection systems are not available, call Motorola Customer Service for assistance.

Please visit www.motorola.com/recycle <http://www.motorola.com/recycle> for instructions on recycling.

Beskyttelse af miljøet med genbrug

Når du ser dette symbol på et Motorola-produkt, må produktet ikke bortskaffes sammen med husholdningsaffald eller erhvervsaffald.

Genbrug af dit Motorola-udstyr

Dette produkt må ikke bortskaffes sammen med husholdningsaffald eller erhvervsaffald. Nogle lande eller områder, f.eks. EU, har oprettet systemer til indsamling og genbrug af elektriske og elektroniske affaldsprodukter. Kontakt de lokale myndigheder for oplysninger om gældende fremgangsmåder i dit område. Hvis der ikke findes tilgængelige indsamlingssystemer, kan du kontakte Motorola Kundeservice.

Umweltschutz durch Recycling

Wenn Sie dieses Zeichen auf einem Produkt von Motorola sehen, entsorgen Sie das Produkt bitte nicht als gewöhnlichen Hausoder Büromüll.

Recycling bei Geräten von Motorola

Bitte entsorgen Sie dieses Produkt nicht als gewöhnlichen Haus- oder Büromüll. In einigen Ländern und Gebieten, z. B. in der Europäischen Union, wurden Systeme für die Rücknahme und Wiederverwertung von Elektroschrott eingeführt. Erkundigen Sie sich bitte bei Ihrer Stadtoder Kreisverwaltung nach der geltenden Entsorgungspraxis. Falls bei Ihnen noch kein Abfuhroder Rücknahmesystem besteht, wenden Sie sich bitte an den Kundendienst von Motorola.

Cuidar el medio ambiente mediante el reciclaje

Cuando vea este símbolo en un producto Motorola, no lo deseche junto con residuos residenciales o comerciales.

Reciclaje de su equipo Motorola

No deseche este producto junto con sus residuos residenciales o comerciales. Algunos países o regiones, tales como la Unión Europea, han organizado sistemas para recoger y reciclar desechos eléctricos y electrónicos. Comuníquese con las autoridades locales para obtener información acerca de las prácticas vigentes en su región. Si no existen sistemas de recolección disponibles, solicite asistencia llamando el Servicio al Cliente de Motorola.

Recyclage pour le respect de l'environnement

Lorsque vous voyez ce symbole sur un produit Motorola, ne le jetez pas avec vos ordures ménagères ou vos rebuts d'entreprise.

Recyclage de votre équipement Motorola

Veuillez ne pas jeter ce produit avec vos ordures ménagères ou vos rebuts d'entreprise. Certains pays ou certaines régions comme l'Union Européenne ont mis en place des systèmes de collecte et de recyclage des produits électriques et électroniques mis au rebut. Veuillez contacter vos autorités locales pour vous informer des pratiques instaurées dans votre region. Si aucun système de collecte n'est disponible, veuillez appeler le Service clientèle de Motorola qui vous apportera son assistance.

Milieubewust recycleren

Als u dit symbool op een Motorola-product ziet, gooi het dan niet bij het huishoudelijk afval of het bedrijfsafval.

Uw Motorola-materiaal recycleren.

Gooi dit product niet bij het huishoudelijk afval het of bedrijfsafval. In sommige landen of regio's zoals de Europese Unie, zijn er bepaalde systemen om elektrische of elektronische afvalproducten in te zamelen en te recycleren. Neem contact op met de plaatselijke overheid voor informatie over de geldende regels in uw regio. Indien er geen systemen bestaan, neemt u contact op met de klantendienst van Motorola.

Dbałość o środowisko - recykling

Produktów Motorola oznaczonych tym symbolem nie należy wyrzucać do komunalnych pojemników na śmieci.

Recykling posiadanego sprzętu Motorola

Produktu nie należy wyrzucać do komunalnych pojemników na śmieci. W niektórych krajach i regionach, np. w Unii Europejskiej, istnieją systemy zbierania i recyklingu sprzętu elektrycznego i elektronicznego. Informacje o utylizacji tego rodzaju odpadów należy uzyskać od władz lokalnych. Jeśli w danym regionie nie istnieją systemy zbierania odpadów elektrycznych i elektronicznych, informacje o utylizacji należy uzyskać od biura obsługi klienta firmy Motorola (Motorola Customer Service).

Cuidando do meio ambiente através da reciclagem

Quando você ver este símbolo em um produto Motorola, não descarte o produto junto com lixo residencial ou comercial.

Reciclagem do seu equipamento Motorola

Não descarte este produto junto com o lixo residencial ou comercial. Alguns países ou regiões, tais como a União Européia, criaram sistemas para colecionar e reciclar produtos eletroeletrônicos. Para obter informações sobre as práticas estabelecidas para sua região, entre em contato com as autoridades locais. Se não houver sistemas de coleta disponíveis, entre em contato com o Serviço ao Cliente da Motorola para obter assistência.

Var rädd om miljön genom återvinning

När du ser den här symbolen på en av Motorolas produkter ska du inte kasta produkten tillsammans med det vanliga avfallet.

Återvinning av din Motorola-utrustning

Kasta inte denna produkt tillsammans med det vanliga avfallet. Vissa länder eller regioner, som t.ex. EU, har satt upp ett system för insamling och återvinning av el- och elektronikavfall. Kontakta dina lokala myndigheter för information om vilka regler som gäller i din region. Om det inte finns något insamlingssystem ska du kontakta Motorolas kundtjänst för hjälp.

リサイクルによる環境保護

モトローラ製品にこの記号が表示されている場合、製品を家庭または商業廃棄物として処分しないでください。

モトローラ装置のリサイクル

本製品を家庭または商業廃棄物として処分しないでください。欧州連合などの国または地域によっては、電気的・電子的廃棄物を収集およびリサイクルするシステムがあります。お住まいの地域で決められている方法についての情報は、地方自治体にお問い合わせください。収集システムがない場合、モトローラ・カスタマーサービスまでお問い合わせください。

재활용으로 환경 보호하기

Motorola 제품에 이 표시가 있는 경우, 가정 또는 상업 폐기물과 함께 버리지 마십시오.

Motorola 기기 재활용

이 제품을 가정용 또는 사업용 폐기물과 함께 버리지 마십시오. 유럽 유니온과 같은 일부 국가 또는 지역에서는 재활용 전기 전자 폐기물 항목을 수집하는 시스템이 구축되어 있습니다. 해당 지역에 구축되어 있는 절차에 관한 정보는 지역 관할당국에 연락하십시오. 수집 시스템이 존재하지 않는 경우, 도움을 받기 위해 Motorola 고객서비스부로 연락하십시오.

重复利用，保护环境

如果 Motorola
产品上具有这个标识，请勿将产品丢弃到家庭或商业垃圾中。

Motorola 设备的重复利用

请勿将本产品丢弃到家庭或商业垃圾中。某些国家或地区，
例如欧盟，
已经建立起回收和重复利用电气与电子废弃物的体系。请与当地相关机构联系，获取有关所在地区相关规定的信息。如果当地尚未建立回收体系，请致电 Motorola 客户服务以寻求帮助。

注意環保問題

在你看到產品上有Motorola的標誌時，請勿以住家或商用的廢棄物方式處置。

Motorola 設備的回收

請勿以住家或商用的廢棄物方式處置。某些國家或地區，如歐盟，已對廢棄的電器和電子產品制訂回收以及再利用體制。請與您所在地的管理機構諮詢相關規定。
若您所在的地區並未設置回收機制，請電Motorola客服部諮詢相關事宜。

Please visit http://www.motorola.com/recycle for instructions on recycling.

Appendix A Motorola® Gateway Captive Portal Implementation

This section contains information about the Motorola Gateway Captive Portal Support.

Overview

Motorola follows the 2Wire RPC specification for implementation of Captive Portal.

The Captive Portal feature redirects all TCP traffic destined to port 80 and redirects it to a captive portal URL. White-IP address list can be configured. HTTP traffic destined to IP addresses in the white IP address list will not be redirected. Changes to Captive Portal parameters take place immediately without reboot.

- PortalURL can be a maximum of 512 characters long.
- A maximum of 500 WhiteIPAddresses are supported WhiteIPAddresses list takes a comma-separated string, which can be Individual IP addresses or a range of IP addresses. For a range of IP Addresses, subnet mask is required.
- The following formats of IP address are accepted:
- Individual IP address - 144.130.120.62 or 144.130.120.62/32
- Range of 64 IP addresses - 144.130.120.64/26
- White IP Address list gets rewritten on any changes.
- Clearing the Captive Portal URL disables Captive Portal. Turning OFF the enable parameter can also disable captive Portal functionality.
- Captive Portal is disabled by default and enabled via TR-069
- White List can be a combination of FQDN (Fully Qualified Domain Names) and white IP Address/ cidr.
- FQDNs will be resolved to IP addresses on BOOT and whenever a new list is pushed.
- For NVG510, Captive Portal implementation only redirects port 80 traffic.Traffic to port 443 is allowed.
- DNS Traffic will not be blocked

Captive Portal RPC

RPC supported per 2Wire requirements that will set Captive Portal Parameters.

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
 xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
 xmlns:tns="urn:dslforum-org:cwmp-1-0"
targetNamespace="urn:dslforum-org:cwmp-1-0"
 elementFormDefault="unqualified"
attributeFormDefault="unqualified">
  <xs:import namespace="http://schemas.xmlsoap.org/soap/envelope/"
    schemaLocation="soapenv.xsd"/>
  <xs:import namespace="http://schemas.xmlsoap.org/soap/encoding/"
    schemaLocation="soapenc.xsd"/>

<xs:complexType name="CaptivePortalParamStruct">
    <xs:sequence>
      <xs:element name="Enable" type="soapenc:boolean">
        <xs:annotation>
          <xs:documentation>If true, the Captive Portal is enabled.<
xs:documentation>
          <xs:documentation>If false, the Captive Portal is
disabled.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="RedirectURL">
        <xs:annotation>
          <xs:documentation>the URL to be redirected to.<
xs:documentation>
        </xs:annotation>
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:maxLength value="512"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="WhiteList" type="tns:WhiteList">
        <xs:annotation>
          <xs:documentation>a list of sites and IP address to be
escaped by the Captive Portal.</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
```

X_00D09E_GetCaptivePortalParams RPC:

```
<!-- X_00D09E_GetCaptivePortalParams -->
  <xs:element name="X_00D09E_GetCaptivePortalParams">
    <xs:annotation>
      <xs:documentation>X_00D09E_GetCaptivePortalParams message is
to get the Captive Portal parameters on a CPE.</xs:documentation>
```

```
    </xs:annotation>
    <xs:complexType/>
  </xs:element>

<!-- X_00D09E_GetCaptivePortalParamsResponse -->
  <xs:element name="X_00D09E_GetCaptivePortalParamsResponse">
    <xs:annotation>
      <xs:documentation>X_00D09E_GetCaptivePortalParamsResponse
response message for X_00D09E_GetCaptivePortalParams request.<
xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:sequence>
        <xs:element name="CaptivePortalParamStruct"
type="tns:CaptivePortalParamStruct"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
```

X_00D09E_SetCaptivePortalParams RPC:

```
<!-- X_00D09E_SetCaptivePortalParams -->
  <xs:element name="X_00D09E_SetCaptivePortalParams">
    <xs:annotation>
      <xs:documentation>X_00D09E_SetCaptivePortalParams message to
set the Captive Portal parameters on a CPE.</xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:sequence>
        <xs:element name="CaptivePortalParamStruct"
type="tns:CaptivePortalParamStruct"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

<!-- X_00D09E_SetCaptivePortalParamsResponse -->
  <xs:element name="X_00D09E_SetCaptivePortalParamsResponse">
    <xs:annotation>
      <xs:documentation>X_00D09E_SetCaptivePortalParamsResponse
response message is a response for X_00D09E_SetCaptivePortalParams
request.</xs:documentation>
    </xs:annotation>
    <xs:complexType/>
  </xs:element>
```

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Motorola® Mobility DSL Gateways

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