



Administrator's Handbook

ARRIS® Embedded Software Version 9.1.0

ARRIS® NVG599 VDSL2 Gateway



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TABLE 1. Document Change Log

Draft version	Firmware version	Changes this draft
1	tbd	First release

Table of Contents

CHAPTER 1 - Introduction	7
About ARRIS Documentation	7
Related Documentation	7
Documentation Conventions	8
General	8
Internal Web Interface	8
Command Line Interface	8
Organization	9
A Word About Example Screens	9
CHAPTER 2 - Device Configuration	11
Important Safety Instructions	12
POWER SUPPLY INSTALLATION	12
TELECOMMUNICATION INSTALLATION	12
COAX INSTALLATION	12
PRODUCT VENTILATION	12
Status Indicator Lights	13
Battery Installation (optional)	16
Battery Door Instructions	17
Set up the ARRIS Gateway	18
Microsoft Windows:	18
Macintosh MacOS 8 or higher or Mac OS X:	20
Accessing the Web Management Interface	21
Broadband Network Redirect Pages	22
IP Diagnostics Page Redirect	23
Offline Troubleshooting	23
Device Status Page	24
Device Access Code	24
Tab Bar	27
Help	27
Links Bar	27
Device List	28
System Information	29
Access Code	30
Remote Access	31
Battery	32
Restart Device	33
Broadband Tab	34
Broadband Status	34
Configure	37
IGMP Stats	38

Home Network Tab	39
Configure	42
HPNA Configure	42
WiFi	43
Wireless Security	45
MAC Filtering	46
Wireless Scan	47
Subnets & DHCP	47
IP Allocation	49
HPNA	51
Voice	53
Line Details	54
Call Statistics	55
Firewall	59
Packet Filter	60
Working with Packet Filters	62
NAT/Gaming	67
Custom Services	69
IP Passthrough	73
Firewall Advanced	76
Diagnostics	78
Logs	81
Update	83
Resets	84
Syslog	85
Event Notifications	86
NAT Table	86

CHAPTER 3 - Basic Troubleshooting 87

Status Indicator Lights	88
LED Function Summary Matrix	91
Factory Reset Switch	95
Log Event Messages	96

CHAPTER 4 - Command Line Interface 101

Overview	103
Starting and Ending a CLI Session	105
Logging In	105
Ending a CLI Session	105
Using the CLI Help Facility	106
About SHELL Commands	106
SHELL Prompt	106
SHELL Command Shortcuts	106
SHELL Commands	107
Common Commands	107
WPS Commands	116

WAN Commands	116
About CONFIG Commands	118
CONFIG Mode Prompt	118
Navigating the CONFIG Hierarchy	118
Entering Commands in CONFIG Mode.	118
Guidelines: CONFIG Commands.	119
Displaying Current Gateway Settings.	119
Step Mode: A CLI Configuration Technique.	119
Validating Your Configuration.	120
CONFIG Commands	121
Connection Commands.	121
Filter Set Commands.	124
Global Filter Set (“IPv6 Firewall”) Commands.	128
Queue Commands.	129
IP Gateway Commands	132
IPv6 Commands	132
IP DNS Commands.	139
IP IGMP Commands.	139
NTP Commands	142
Application Layer Gateway (ALG) Commands.	142
Dynamic DNS Commands	143
Link Commands	143
Management Commands	146
Remote Access Commands.	148
Physical Interfaces Commands	150
PPPoE Relay Commands	157
NAT Pinhole Commands	157
Security Stateful Packet Inspection (SPI) Commands	158
VoIP Commands.	160
Targeted Ad Insertion Commands	171
System Commands	173
Debug Commands	178
Disclaimer and Warning Text	178
Commands	178
TR-069 CLI CShell Commands (debug mode).	178

CHAPTER 5 - Technical Specifications and Safety Information. 179

Description	179
Power Supply	179
Environment.	179
Software and protocols.	179
Agency approvals	180
Manufacturer’s Declaration of Conformance	181
Important Safety Instructions	183
47 CFR Part 68 Information	184
FCC Requirements	184
FCC Statements	184
RF Exposure Statement:	185

Electrical Safety Advisory	185
Caring for the Environment by Recycling	186
Beskyttelse af miljøet med genbrug	186
Umweltschutz durch Recycling.	186
Cuidar el medio ambiente mediante el reciclaje	186
Recyclage pour le respect de l'environnement.	186
Milieubewust recycleren	187
Dbá³oËç o Êrodowisko - recykling	187
Cuidando do meio ambiente através da reciclagem	187
Var rädd om miljön genom återvinning.	187
Copyright Acknowledgments	189
Open Source Software Information	189

Appendix A - ARRIS Gateway Captive Portal Implementation 213

Overview	214
Captive Portal RPC	215
X_00D09E_GetCaptivePortalParams RPC:	215
X_00D09E_SetCaptivePortalParams RPC:	216

Appendix B - Quality of Service (QoS) Examples 217

Overview	218
Upstream QoS: Priority and Shaping	220
Downstream QoS: Ethernet Switch	221
Downstream QoS: Egress queues	221

Index 223

CHAPTER 1 Introduction

About ARRIS Documentation

This guide describes the wide variety of features and functionality of the ARRIS NVG599 Gateway, when used in Router mode. The NVG599 device can also be delivered in Bridge mode. In Bridge mode, the NVG599 acts as a pass-through device and allows the workstations on your LAN to have public addresses directly on the Internet. Documentation for the NVG599 in Bridge mode is available for download.



NOTE::

For the purposes of this manual the “ARRIS NVG599 Gateway” will be referred to as the “NVG599.”

Related Documentation

ARRIS provides a suite of technical documents for its family of intelligent enterprise and consumer gateways. This documentation consists of:

- ◆ Administrator’s Handbook (this document)
- ◆ Dedicated user manuals
- ◆ Specific white papers covering related technology

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

Documentation Conventions

This manual uses the following conventions to present information.



General

The following typographic conventions are used in this guide.

Convention	Description
bold sans serif	Menu commands and button names
<u>underlined sans serif</u>	Web GUI page links
<code>terminal</code>	Computer display text
bold terminal	User-entered text
<i>italic</i>	The complete titles of manuals

Internal Web Interface

The following graphic conventions are used when describing elements of the Web interface in this guide.

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

Command Line Interface

Syntax conventions for the command line interface are as follows.

Convention	Description
[]	Optional command arguments are shown with straight brackets
{ }	Alternative values for an argument are presented in curly ({}) brackets, with values separated by vertical bars ().
bold	User-entered text
<i>italic</i>	Variables for which you supply your own values

Organization

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

- ◆ **Chapter 1, "Introduction"** — Describes the ARRIS® document suite and the purpose of, audience for, and structure of this guide. It includes a table of style conventions.
- ◆ **Chapter 2, "Device Configuration"** — Describes how to get up and running with your NVG599.
- ◆ **Chapter 3, "Basic Troubleshooting"** — Gives some simple suggestions for troubleshooting problems with the initial configuration of your NVG599.
- ◆ **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 are provided.
- ◆ **Chapter 5, "Technical Specifications and Safety Information"** — Presents system and device specifications and important compliance and safety statements.
- ◆ **Appendix A, "ARRIS Gateway Captive Portal Implementation"** — Describes the ARRIS Gateway Captive Portal Implementation.
- ◆ **Appendix B, "Quality of Service (QoS) Examples"** — Describes the ARRIS Gateway Quality of Service (QoS) Implementation.

A Word About Example Screens

This manual contains many example screen illustrations. Since ARRIS gateways offer a wide variety of features and functionality, the example screens shown may not exactly match the screens for your particular device or setup. 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 sufficient to meet their needs. The Quick Start section may be all that you need to configure and use your ARRIS NVG599 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” on page 12](#)
- ◆ [“Status Indicator Lights” on page 13](#)
- ◆ [“Battery Installation \(optional\)” on page 16](#)
- ◆ [“Battery Door Instructions” on page 17](#)
- ◆ [“Set up the ARRIS Gateway” on page 18](#)
- ◆ [“Accessing the Web Management Interface” on page 21](#)
- ◆ [“Device Status Page” on page 24](#)
- ◆ [“Tab Bar” on page 27](#)
- ◆ [“Broadband Tab” on page 34](#)
- ◆ [“Home Network Tab” on page 39](#)
- ◆ [“WiFi” on page 43](#)
- ◆ [“Voice” on page 53](#)
- ◆ [“Firewall” on page 59](#)
- ◆ [“Diagnostics” on page 78](#)

Important Safety Instructions

POWER SUPPLY INSTALLATION

Connect the power supply cord to the power jack on the NVG599. 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.

TELECOMMUNICATION INSTALLATION

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury, 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.
- ◆ **CAUTION:** To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

COAX INSTALLATION

Ensure that the outside coaxial cable system is grounded, so as to provide some protection against voltage surges and built-up static charges. Article 820-20 of the NEC (Section 54, Part I of the Canadian Electrical Code) provides guidelines for proper grounding and, in particular, specifies that the CATV cable ground be connected to the grounding system of the building, as close to the point of cable entry as practical.

PRODUCT VENTILATION

The NVG599 is intended for use in a consumer's home. Ambient temperatures should not exceed 104°F (40°C). The NVG599 should not be used in locations exposed to outside heat radiation or where it is subject to 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.



WARNING:

The battery used in this device may present a risk of fire or chemical burn if mistreated. Do not disassemble, heat above manufacturer's maximum temperature limit, or incinerate. Replace battery with ARRIS P/N 586185-002-00 only. Use of another battery may present a risk of fire or explosion.

Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

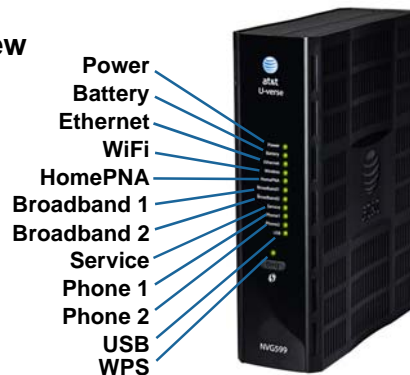
SAVE THESE INSTRUCTIONS

Status Indicator Lights

Colored LEDs on your NVG599 indicate the activity status of various ports.


ARRIS NVG599 Status Indicator Lights

Side View

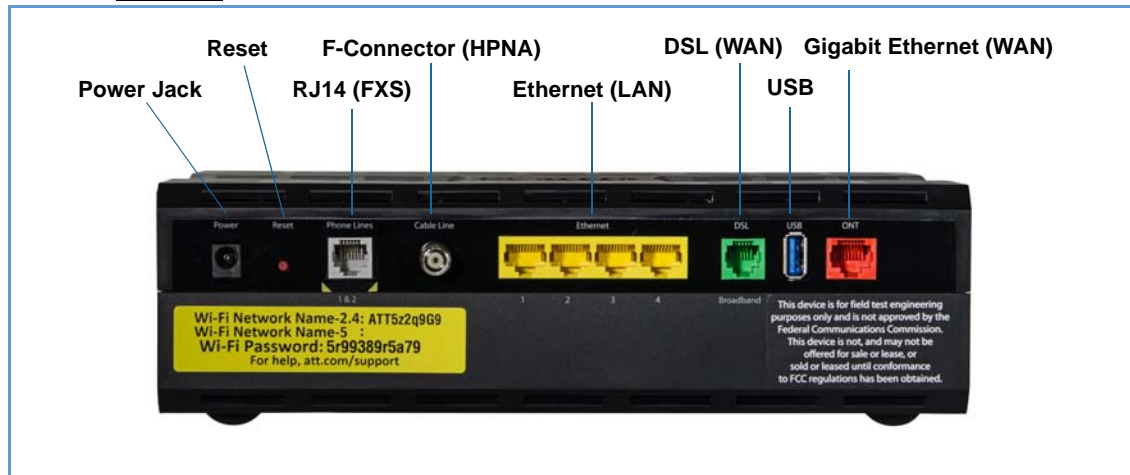


LED	Activity
Power	<p>Solid Green = The device is powered.</p> <p>Flashing Green = A power-on self-test (POST) is in progress</p> <p>Flashing Red = A POST failure (not bootable) or device malfunction occurred.</p> <p>Flashing Amber = Firmware upgrade in progress (see below)</p> <p>Off = The unit has no AC power. If the battery is in use, the Battery LED will indicate battery status, and all other LEDs will be off.</p>
Power during Firmware Upgrade	<p>During the software installation, you will lose Internet and phone service. The LEDs will function as follows:</p> <ol style="list-style-type: none"> As firmware is being loaded into flash, the LEDs operate normally. During the firmware upgrade, which takes a few minutes, the Power LED will flash amber (flash writing to memory), and all other LEDs are off. The NVG599 restarts automatically. As the device reboots, the LEDs display power-on behavior.
All during Boot process	<ul style="list-style-type: none"> Power LED = Flashing Green All other LEDs = Off <p>If the device does not boot and fails its self-test or fails to perform initial load of the bootloader:</p> <ul style="list-style-type: none"> Power LED = Flashing Red ALL other LEDs = Off <p>If the device boots and then detects a failure:</p> <p>Power LED = Flashing Green starting POST, and then all LEDs will flash red, including Power LED.</p>
Battery	<p>Solid Green = Battery in place but not being used.</p> <p>Flashing Green = Battery charging.</p> <p>Solid Red = Battery backup mechanism has a fault.</p> <p>Flashing Red = Battery needs to be replaced.</p> <p>Solid Amber = Battery in use.</p> <p>Flashing Amber = Low battery.</p> <p>Off = No battery, or battery has no charge.</p>

LED	Activity
Ethernet	<p>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).</p> <p>Flickering Green = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic.</p> <p>Off = The device is not powered, or no cable or no powered devices are connected to the associated ports.</p>
WiFi	<p>Solid Green = Wi-Fi is powered.</p> <p>Flickering Green = Activity seen from devices connected via Wi-Fi. The flickering of the light is synchronized to actual data traffic.</p> <p>Off = The device is not powered, or no powered devices are connected to the associated ports.</p>
HomePNA	<p>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).</p> <p>Flickering Green = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic.</p> <p>Off = The device is not powered, or no cable or no powered devices are connected to the associated ports.</p>
Broadband 1**, 2	<p>Solid Green = Good broadband connection (good DSL sync or Gigabit Ethernet).</p> <p>Flashing Green = Attempting broadband connection (DSL attempting sync).</p> <p>Flashing Green and Red = If, after three consecutive minutes, the broadband connection fails to be established, the LED switches to Flashing Green alternating with a five second steady Red while attempting or waiting to establish a broadband connection. This pattern continues until the broadband connection is successfully established.</p> <p>Flashing Red = No DSL signal on the line. This display is not used during times of temporary 'no tone' during the training sequence.</p> <p>Off = The device is not powered.</p> <p>** Broadband 1 LED is also the Gigabit Ethernet WAN LED when that is in play (and DSL is not).</p>
Service	<p>Solid Green = IP connected. The device has a WAN IP address from DHCP or 802.1x authentication and the broadband connection is up.</p> <p>Flashing Green = Attempting connection, attempting IEEE 802.1X authentication, or attempting to obtain DHCP information.</p> <p>Red = Device attempted to become IP connected and failed (no DHCP 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.</p> <p>Off = The device is not powered or the broadband connection is not present.</p>
Phone 1, 2	<p>Solid Green = The associated VoIP line has been registered with a SIP proxy server.</p> <p>Flashing Green = Indicates a telephone is off-hook on the associated VoIP line.</p> <p>Off = VoIP not in use, line not registered, or gateway power off.</p>
USB	<p>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).</p> <p>Flickering Green = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic.</p> <p>Off = The device is not powered, no cable or no powered devices connected to the associated ports.</p>

LED	Activity
WPS (appears after using WPS button) 	<p>Solid Green = Wi-Fi Protected Setup has been completed successfully. LED should stay on for 5 minutes or until push button is pressed again.</p> <p>Flashing Green = Continues for 2 minutes, indicating when WPS is broadcasting.</p> <p>Flashing Red = Continues for 2 minutes, indicating a Session overlap was detected (possible security risk).</p> <p>Solid Red = Error unrelated to security, such as failure to find a partner, or WPS is disabled. LED should stay solid red for 5 minutes or until push button is pressed again.</p> <p>Off = The device is not powered, or no cable or no powered devices are connected to the associated ports.</p>

Rear View



LED	Activity
Ethernet 1, 2, 3, 4	<p>Flashing Amber = A Gigabit Ethernet device is connected to each port.</p> <p>Solid Green = A 10/100 Ethernet device is connected.</p> <p>Flickering Green = Ethernet traffic activity.</p> <p>Off = The device is not powered, or no powered devices are connected to the associated ports.</p>



NOTE:

The NVG599 supports two VoIP lines over one RJ14 (FXS) VoIP port. In order to connect two phone lines, the supplied inner/outer pair splitter adapters must be attached to the RJ14 (FXS) VoIP port in order to terminate both lines. This is a special-purpose splitter. You must use only the inner/outer pair splitter adapters supplied by AT&T.



Battery Installation (optional)

The optional backup battery is located in a compartment on the bottom of the unit. Installing the battery door requires some care.



CAUTION:

The battery used in this device may present a risk of fire or chemical burn if mistreated. Do not disassemble, heat above manufacturer's maximum temperature limit, or incinerate. Replace battery with ARRIS P/N 586185-002-00 only. Use of another battery may present a risk of fire or explosion.

Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

1. Note the tab on the bottom of the battery.



2. Insert the battery into the compartment on the bottom of the unit, as shown, and press into place so that the battery contacts seat securely in the unit.



Battery Compartment Door

3. Close the compartment door. See ["Battery Door Instructions" on page 17.](#)

Battery Door Instructions

1. Place NVG599 unit on a tabletop with the battery door side up.
2. Push in and upward to open the battery door as shown in Figure 1.



Figure 1



Figure 2



Figure 3

3. Swing back the battery door. See Figure 2.
4. Insert the battery in the compartment as shown in Figure 3.
5. Swing the door back down and snap closed.

Set up the ARRIS Gateway

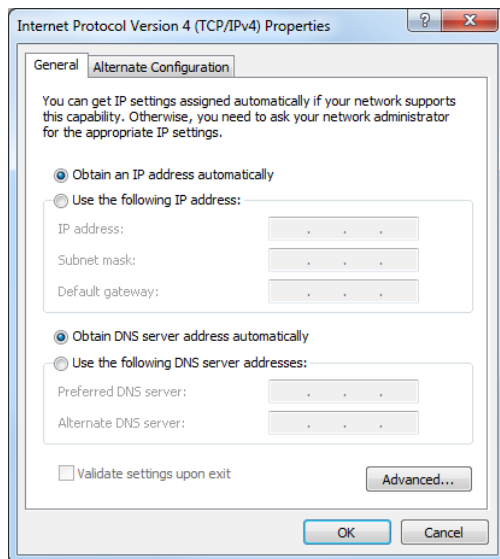
Refer to your Quick Start Guide for instructions on how to connect your NVG599 to your power source, PC, or local area network, and your Internet access point, whether it is a dedicated DSL outlet or a DSL or cable modem. Be sure to enable dynamic addressing on your PC. To set up the gateway, complete the following steps:

Microsoft Windows:

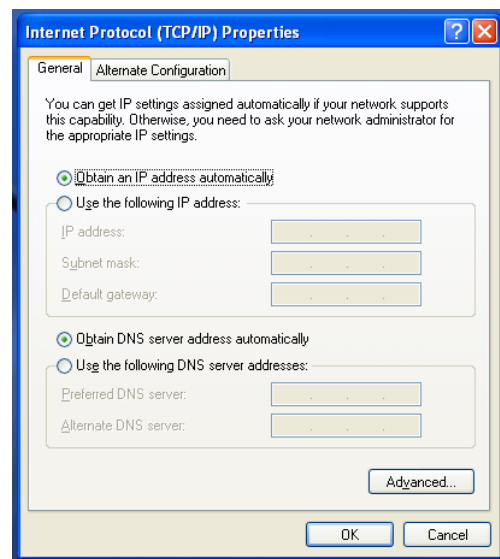
1. Navigate to the TCP/IP Properties control panel to configure the IP address using one of the suggested pathways that follow. Note that Windows Vista and Windows 7 obtain an IP address automatically by default. You may not need to configure it at all.

Windows 7 follows a path like this: **Start menu -> Control Panel -> Network and Sharing Center -> Change adapter settings -> Local Area Connection -> Change settings of this connection -> Local Area Connection Properties -> Internet Protocol (TCP/IP) -> Properties**

Windows XP follows a path like this: **Start menu -> Settings -> Control Panel -> Network Connections -> Local Area Connection -> Internet Protocol [TCP/IP] -> Properties**



Windows 7

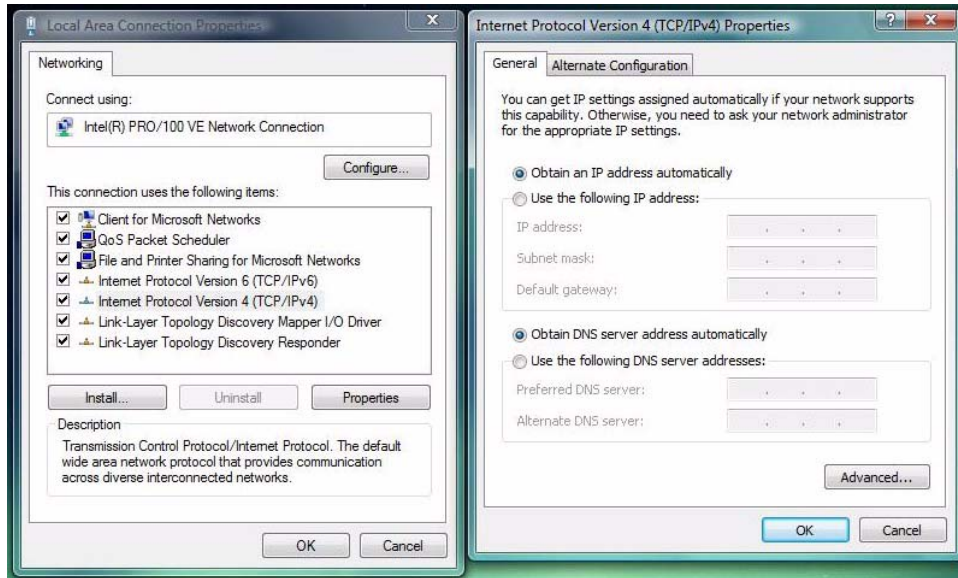


Windows XP

2. Select **Obtain an IP address automatically**.
3. Select **Obtain DNS server address automatically**, if available.
4. Remove any previously configured gateways, if available.
5. OK the settings. Restart if prompted.

To check:

1. Open the Networking control panel and select **Internet Protocol Version 4 (TCP/IPv4)**.
2. Click the **Properties** button. The Internet Protocol Version 4 (TCP/IPv4) Properties window should appear as shown.



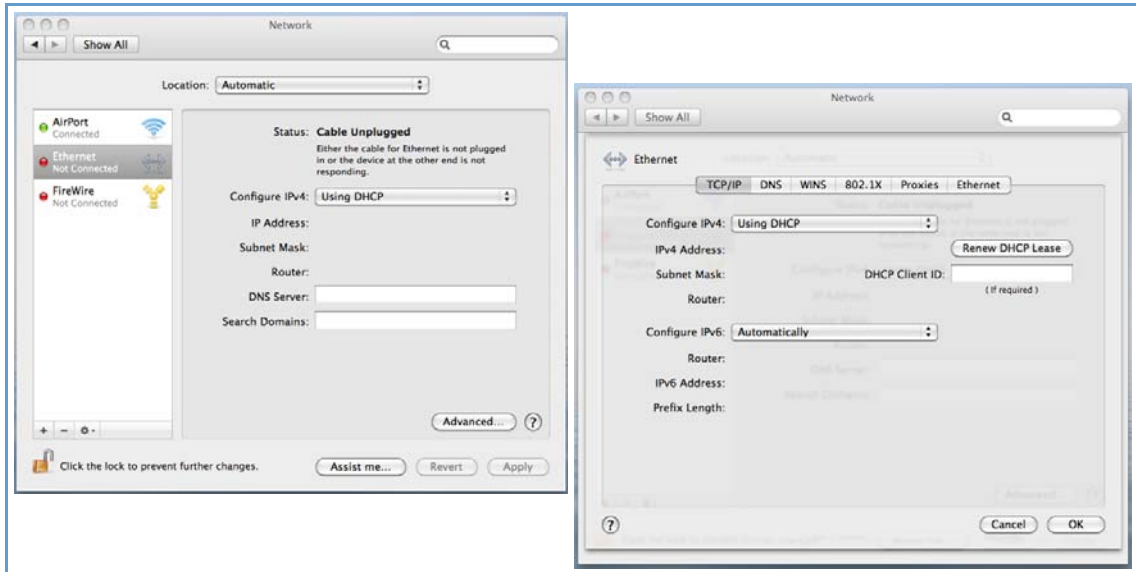
Windows Vista

3. Set the radio buttons to the values shown above, and click the **OK** button.

Macintosh MacOS 8 or higher or Mac OS X:

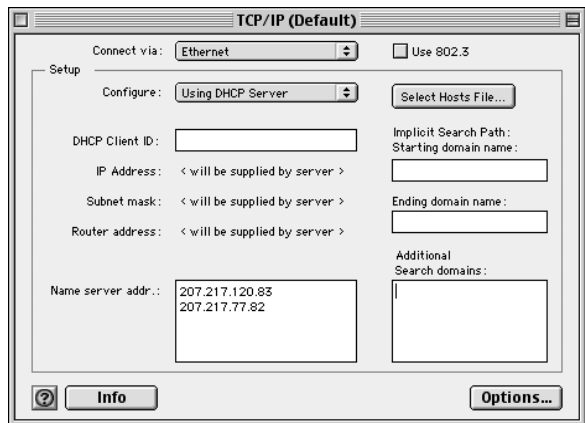
1. Access the **TCP/IP** or **Network** control panel.
- ◆ Mac OS X follows a path like this:

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



- ◆ MacOS Classic follows a path like this:

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



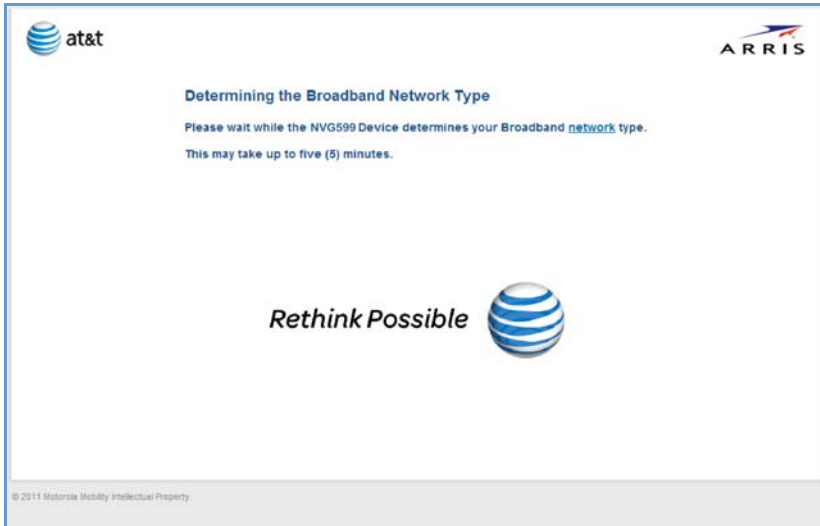
2. Select **Ethernet**.
3. Select **Configure Using DHCP**.
4. Close and save, if prompted.

Proceed to [“Accessing the Web Management Interface”](#) on page 21.

Accessing the Web Management Interface

1. Run your Web browser application, such as Firefox or Microsoft Internet Explorer, from the computer connected to the NVG599 device.
2. Enter <http://192.168.1.254> in the Location text box.

While the NVG599 is determining the broadband network type, the following screen appears.



The Device Status page appears.

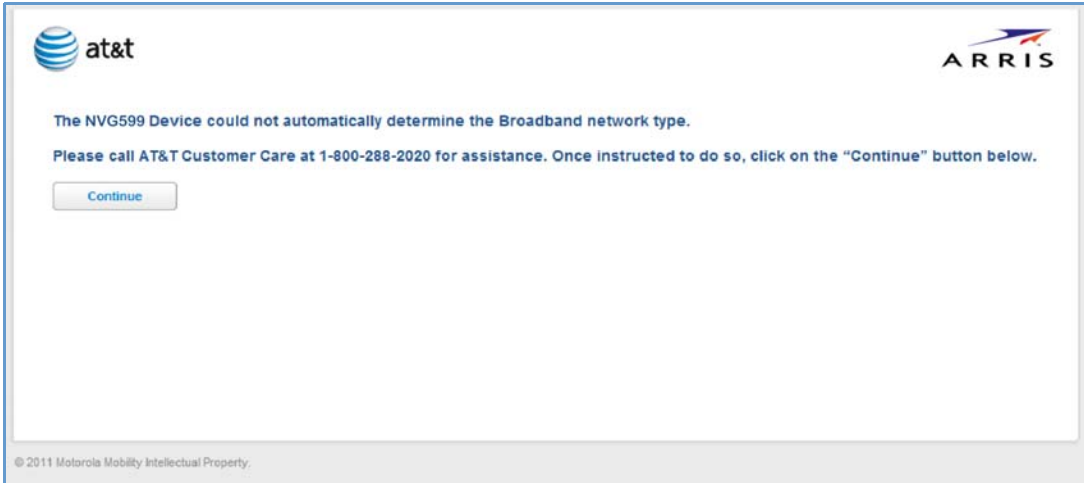
Device	IPV4 Address / Name	MAC Address	Status	Connection	Allocation
	192.168.1.145 / FTJP74-02	70:5a:b6:b0:27:cd	on	Ethernet	dhcp

3. Check to make sure the Broadband and Service LEDs on your NVG599 device are lit **GREEN** to verify that the connection to the Internet is active.

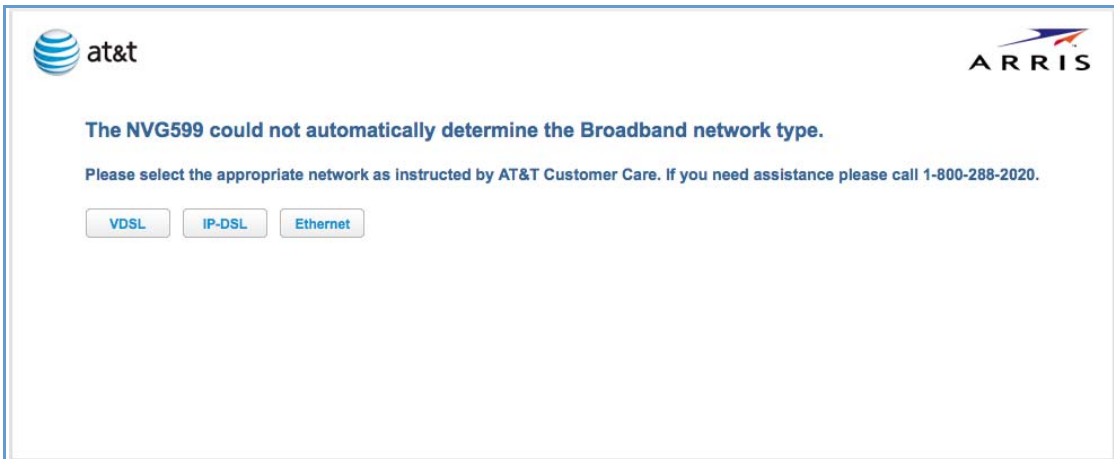
Congratulations! Your installation is complete. You can now surf to your favorite Web sites by typing a URL in your browser's location box or by selecting one of your favorite Internet bookmarks.

Broadband Network Redirect Pages

After a few minutes, if the broadband network cannot be determined, the following screen appears. Contact AT&T Customer Care at the number shown on your screen for assistance.

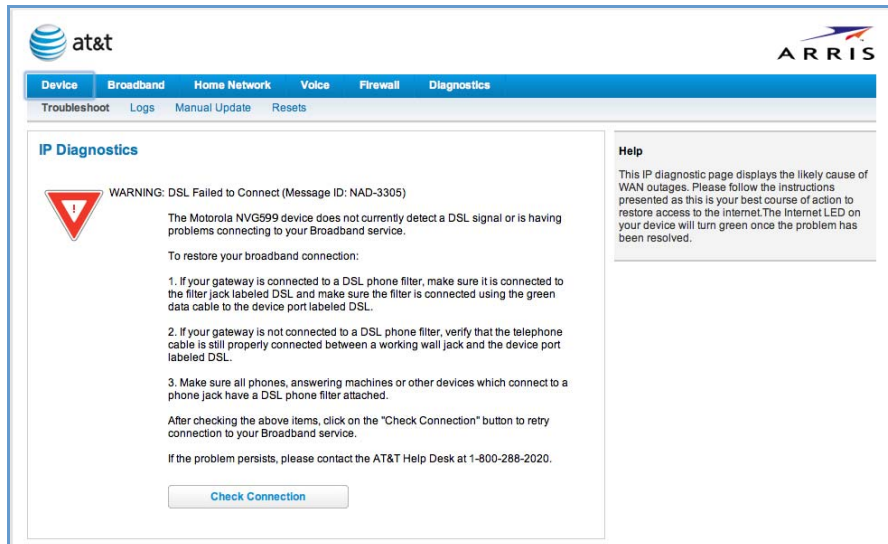


If you click the **Continue** button, the following screen appears. Here you can manually select the broadband network type, if you know it.



IP Diagnostics Page Redirect

In the event that your connection to the Internet fails, the Broadband LED on your NVG599 device flashes **RED** and you are redirected to the IP Diagnostics page.



The screenshot shows the AT&T IP Diagnostics page. At the top, there are logos for AT&T and ARRIS. Below the logos is a navigation bar with tabs for Device, Broadband, Home Network, Voice, Firewall, and Diagnostics. Under the Diagnostics tab, there are sub-links for Troubleshoot, Logs, Manual Update, and Resets. The main content area is titled "IP Diagnostics" and features a warning icon (a red triangle with a white exclamation mark) and the following text:

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

The Motorola NVG599 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.

At the bottom of the warning area is a "Check Connection" button. To the right of the main content area is a "Help" section with the following text:

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.

Follow the on-screen troubleshooting suggestions.

For additional troubleshooting information, see ["Diagnostics" on page 78](#) and ["Basic Troubleshooting" on page 87](#).

When your connection is restored or the problem is resolved, the Broadband LED turns **GREEN**.

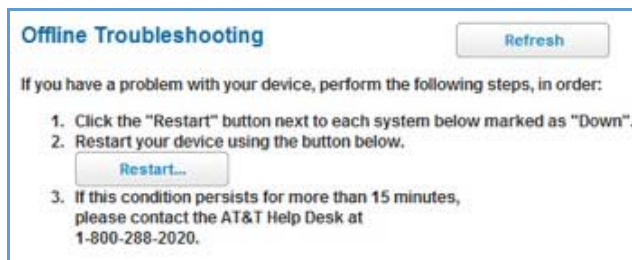


NOTE:

For AT&T this function is enabled by default. See the CLI command ["set management lan-redirect enable \[off | on\]" on page 149](#).

Offline Troubleshooting

If the WAN is down, the following information is displayed at the top of the page:



The screenshot shows the "Offline Troubleshooting" page. At the top left is the title "Offline Troubleshooting" and at the top right is a "Refresh" button. Below the title is the text: "If you have a problem with your device, perform the following steps, in order:"

1. Click the "Restart" button next to each system below marked as "Down".
2. Restart your device using the button below.

Below step 2 is a "Restart..." button.

3. If this condition persists for more than 15 minutes, please contact the AT&T Help Desk at 1-800-288-2020.

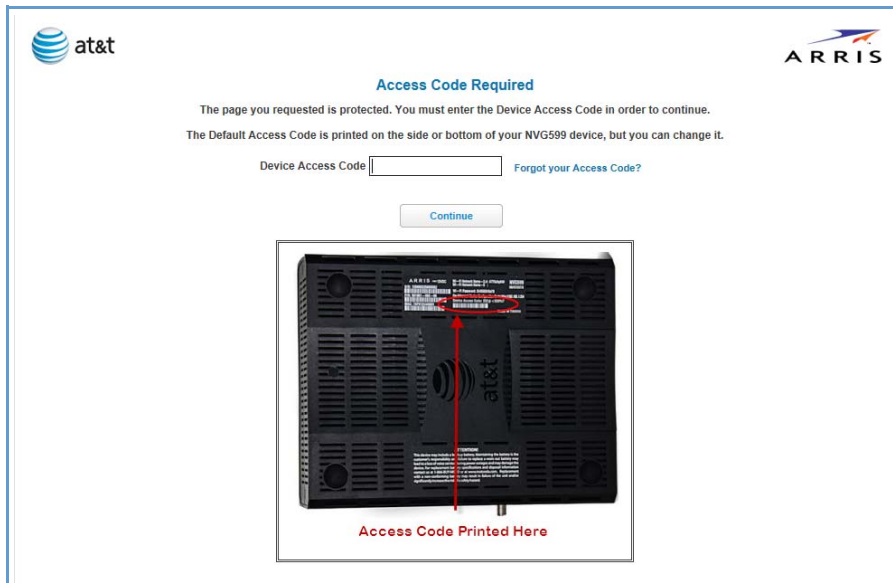
Device Status Page

After you have performed the basic Easy Login configuration, any time you log in to your NVG599 you will access the NVG599 Home page.

To access the Home page, type `http://192.168.1.254` in your Web browser's location box.

Device Access Code

On the Device Status page, you may be required to provide your device access code 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 NVG599.



Enter your device access code and click the [Continue](#) button.






The Device Status page appears.

The screenshot displays the AT&T Device Status page. At the top, there is a navigation bar with tabs for Device, Broadband, Home Network, Voice, Firewall, and Diagnostics. Below this is a sub-navigation bar with links for Status, Device List, System Information, Access Code, Remote Access, Battery, and Restart Device. The main content area is divided into several sections:

- Status:** A summary section with a "More Info" button.
- Broadband Connection:** Status is "Up" with a "Restart" button.
- Status:** Overall system status is "Normal" with a "More Info" button.
- 2.4 Ghz Radio Status:** Status is "On" with a "Restart" button. Below this are details for two Wi-Fi networks:
 - Network Name (SSID): NVG699-TEST, Type: User, Authentication Type: WPA, Password: 1111111111, Status: Enabled.
 - Network Name (SSID): NVG699-TEST_Guest, Type: Guest, Authentication Type: WPA, Password: (blank), Status: Disabled.
- 5 Ghz Radio Status:** Status is "On" with a "Restart" button. Below this are details for one Wi-Fi network:
 - Network Name (SSID): ATThd456, Type: User, Authentication Type: WPA, Password: 1111111111, Status: Enabled.
- Coax to STB:** Status is "On" with a "Restart" button.
- Voice:** Two lines are listed as "Not Subscribed" and "Down", each with a "Restart" button.
- Home Network Devices:** A section with a "More Info" button containing a table of connected devices.

Device IPv4 Address / Name	MAC Address	Status	Connection	Allocation
192.168.1.145 / FTJP74-02	70:5a:b6:b0:27:cd	on	Ethernet	dhcp

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

(icon)	Field	Description
 (Broadband)	Broadband Connection	Waiting for DSL is displayed while the NVG599 is training. This should change to Up within two minutes. Up is displayed when the ADSL line is synched and the session is established. Down indicates inability to establish a connection; possible line failure.
 (Battery)	Status	May display any of these values: Normal, Low Battery, Charging, Warning: No battery or battery has no charge or Warning: Battery backup mechanism has a fault.
 (WiFi)	Status	Your wireless signal may be On or Off.
	Network ID (SSID)	The name or ID that is displayed to a client scan. The default SSID for the NVG599 is attxxx where xxx is the last 3 digits of the serial number located on the side of the NVG599.
	Authentication Type	The type of wireless encryption security in use. May be Disabled, WPA, WEP, Default Key, or Manual.
 (Coax to STB)	Network Key	Wireless network encryption key in use.
	Status	Off or On.
 (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 be displayed, depending on your particular setup.

The [Diagnostics](#) button will connect you to the Troubleshoot page. See [“Diagnostics” on page 78](#).

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

Common Tasks

- [Go to AT&T online support for troubleshooting and repair »](#)
- [Modify your Wi-Fi security or settings »](#)
- [Restart your device »](#)
- [Find a computer on your home network »](#)
- [Adjust firewall settings for gaming and applications »](#)

- ◆ [Display additional troubleshooting steps »](#) - OR - [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 Redirect” on page 23](#).
- ◆ [Modify your WiFi security or settings »](#)
This link will connect you to the WiFi page. See [“WiFi” on page 43](#).
- ◆ [Restart your device »](#)
This link will connect you to the Restart Device page. See [“Restart Device” on page 33](#).
- ◆ [Find a computer on your home network »](#)
This link will connect you to the Device List page. See [“Device List” on page 28](#).
- ◆ [Adjust firewall settings for gaming and applications »](#)
This link will connect you to the NAT/Gaming page. See [“NAT/Gaming” on page 67](#).

Tab Bar

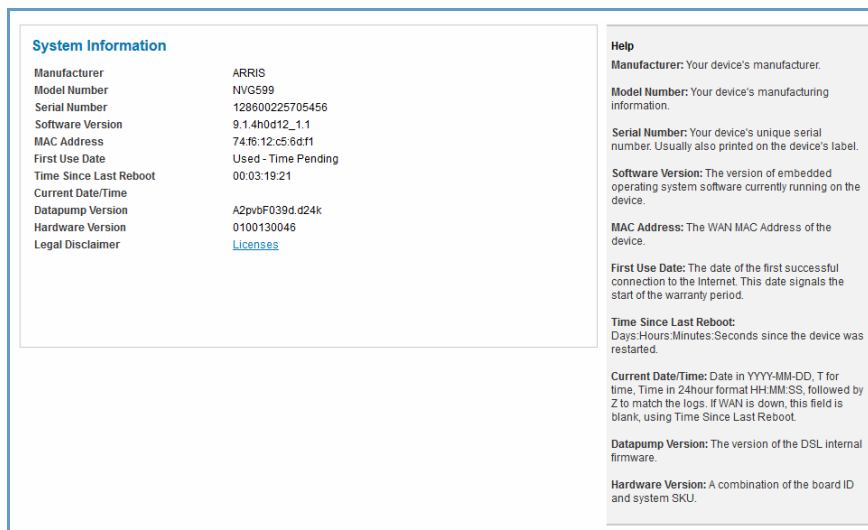
The tab bar is located at the top of every page, allowing you to move freely about the site.



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

Online Help for your device is available in the rightmost frame on every page in the Web interface. For example, the Help section at right is displayed on the System Information page.

A screenshot of the "System Information" page. On the left, there is a table of system details. On the right, there is a "Help" section with definitions for the terms used in the table.

System Information	
Manufacturer	ARRIS
Model Number	NVG599
Serial Number	12860025705456
Software Version	9.1.4h0412_1.1
MAC Address	7416:12:c5:9d:f1
First Use Date	Used - Time Pending
Time Since Last Reboot	00:03:19:21
Current Date/Time	
Datapump Version	A2pvbF039d.d24k
Hardware Version	0100130046
Legal Disclaimer	Licenses

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.

Current Date/Time: Date in YYYY-MM-DD, T for time, Time in 24hour format HH:MM:SS, followed by Z to match the logs. If WAN is down, this field is blank, using Time Since Last Reboot.

Datapump Version: The version of the DSL internal firmware.

Hardware Version: A combination of the board ID and system SKU.

Links Bar

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



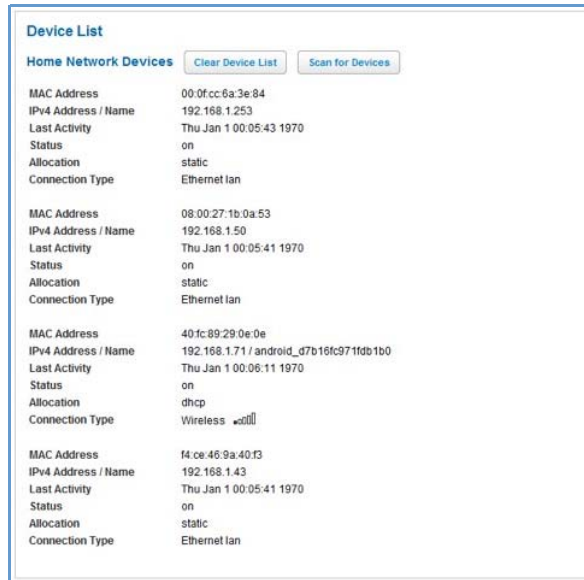
The links bar on the Device Status page includes the following links. For more information about each link, see the related section in this guide.

- ◆ **Status** (see [page 24](#))
- ◆ **Device List** (see [page 28](#))
- ◆ **System Information** (see [page 29](#))
- ◆ **Access Code** (see [page 30](#))
- ◆ **Remote Access** (see [page 31](#))
- ◆ **Battery** (see [page 32](#))

◆ Restart Device (see [page 33](#))

[Link: Device List](#)

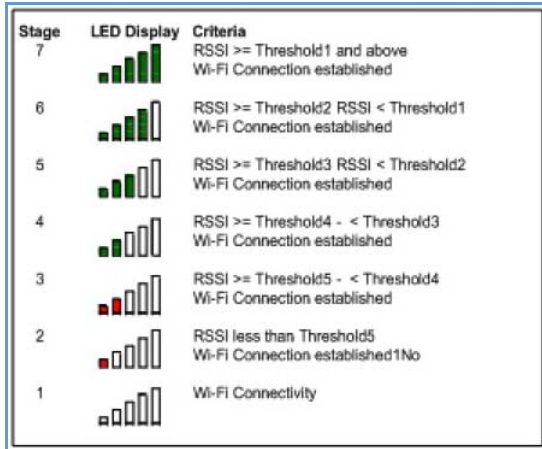
When you click the [Device List](#) link, the Device List page appears.



The page displays the following summary information for each home network device connected to the NVG599 device on your local area network: IPv4 address, network name, MAC address, and other status information.

Home Network Devices	
MAC Address	Client device's unique hardware address.
IPv4 Address / Name	Client device's IP address or device network name.
Last Activity	Date and time of last traffic for this client device.
Status	May be off or on.
Allocation	Type of IP address assignment, for example, static or DHCP.
Connection Type	Type of connection, for example, Ethernet or WiFi.

For WiFi client connections, the Device List page displays the familiar bars indicating signal strength, as follows:



- ◆ Click the [Clear Device List](#) button to update the Home Network Devices summary.
- ◆ Click the [Scan for Devices](#) button to seek out other devices that have been connected since the last Home Network Devices summary update.

Link: System Information

When you click the [System Information](#) link, the System Information page appears.

System Information		Help
Manufacturer	ARRIS	Manufacturer: Your device's manufacturer.
Model Number	NVG599	Model Number: Your device's manufacturing information.
Serial Number	128600225705456	Serial Number: Your device's unique serial number. Usually also printed on the device's label.
Software Version	9.1.4h0d12_1.1	Software Version: The version of embedded operating system software currently running on the device.
MAC Address	74:16:12:c5:6d:f1	MAC Address: The WAN MAC Address of the device.
First Use Date	Used - Time Pending	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	00:03:32:33	Time Since Last Reboot: Days:Hours:Minutes:Seconds since the device was restarted.
Current Date/Time		
Datapump Version	A2pvbF039d.d24k	
Hardware Version	0100130046	
Legal Disclaimer	Licenses	

The page displays the following information:

System Information	
Manufacturer	Manufacturer's identifier name.
Model Number	Manufacturer's model number.
Serial Number	Unique serial number of your device.
Software Version	Version number of the current embedded software in your device.
MAC Address	Unique hardware address of this NVG599 unit.

First Use Date	Date and time the NVG599 device 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 device in days:hr:min:sec.
Current Date/Time	Current system date and time 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, also shown in “Copyright Acknowledgments” on page 189 .

Link: Access Code


When you click the Access Code link, the Access Code page appears and allows changes to the code that controls access to your device's configuration. Access to your NVG599 device is controlled through an account named *Admin*. The default Admin password for your device is the unique access code printed on the label on the side of your device.

As the Admin, you can change this password to one of your own choosing between 8 and 20 characters long. The new password must 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.



Access Code Printed Here

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

[Use Default Access Code](#) [Use New Access Code](#) [Cancel](#)

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: Remote Access

The Remote Access page lets you grant access to your NVG599 device to other users on the WAN. This function can be used for advanced troubleshooting or remote configuration.



WARNING:

Enabling remote access allows anyone who knows or can determine the password, port ID, and URL (address) of your NVG599 device to view any configuration settings or change the operation of your gateway.

If remote access is not currently enabled, the Remote Access page will let you configure and enable it. If remote access has been enabled, the Remote Access page will indicate that, and provides a button to disable it.

The screenshot shows the 'Remote Access' configuration page. At the top, there are navigation tabs: Device, Broadband, Home Network, Voice, Firewall, and Diagnostics. Below these are sub-tabs: Status, Device List, System Information, Access Code, Remote Access, Battery, and Restart Device. The main content area is titled 'Remote Access' and contains the following fields and options:

- User Name: tech
- Password: Mark1900Twain
- Port to use: 42910
- Access Type: Read only access, Update access
- URL: https://10.13.211.30

A blue button labeled 'Enable Remote Access' is located at the bottom of the form. To the right of the form is a 'Help' section with the following text:

Help

This page allows you to specify a password and enable remote access to your NVG599 device from the Internet. The remote access password must be at least 8 characters and must contain characters from two of these categories: alpha, numeric, and special characters.

Type the Access URL exactly as shown on the page.

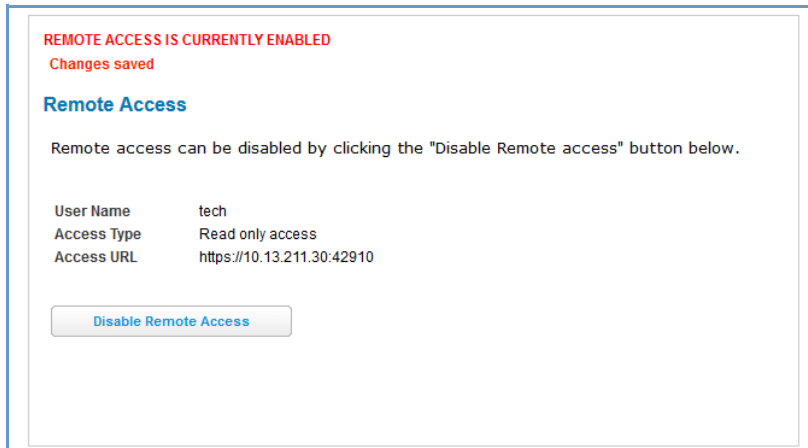
This should only be done if requested by your service provider.

To enable remote access:

1. Type a password in the **Password** field. This password must be at least 8 characters long, and must include at least two of the following types of characters:
 - ◆ Alphabetic (letter) characters
 - ◆ Numeric (number) characters
 - ◆ Special characters (! @ # \$ % ^ & * , etc)
2. If necessary, set a custom port number for secure HTTP access to the NVG599 remote access session in the **Port Value** field.
3. Click the radio button that describes the type of remote access to allow:
 - ◆ Read only access - to allow the remote access session to view, but not change, the configuration and collected statistics of the gateway.
 - ◆ Update access - to allow the session to make changes to the gateway's configuration.
4. Click the **Enable Remote Access** button.

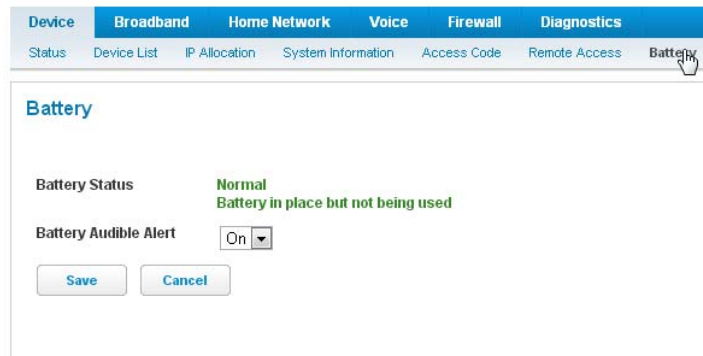
The NVG599 updates the Remote Access page and displays the current remote access settings, shows the URL that a remote access client must use to connect to the remote access session, and provides a button for ending the remote access session. The remote access client will need to connect to the URL shown on the Remote Access page, and will need to log in with the user name "tech" and with the password configured when access was enabled.

To end (disable) an existing remote access configuration, click the [Disable Remote Access](#) button, as shown below:



[Link: Battery](#)

The Battery page shows the condition and status of the NVG599 internal battery, and provides control over the battery condition audible alarm.



The battery condition audible alarm provides an on-hook ringing signal on a connected telephone if the NVG599 battery needs recharging or replacing. This alarm uses a distinctive “splash” ring pattern and a battery notification message on phones with caller ID displays or announcers. Additionally, the NVG599 provides an off-hook voice notification to the subscriber if the NVG599 battery is low (and needs recharging) or faulty (and needs replacing). After playing the recorded voice notification, the NVG599 provides a dial tone.

The alarm is triggered when the NVG599 determines that the installed battery is:

- ◆ Below 35% charge and in need of recharging, or
- ◆ Unable to charge past 80% of capacity and in need of replacing.



Note:

A subscriber may interrupt the voice notification by dialing. The voice notification may be turned off by a subscriber phone dialing “*#103”. This capability is included in the VOIP digit map with the parameter *#103<:@C06>

To change the alarm setting, click the Battery Audible Alert drop-down menu, and select the setting (On or Off) for the alarm. Click the [Save](#) button to save the new settings, or [Cancel](#) to discard them.

[Link: Restart Device](#)

When the NVG599 is restarted, it will disconnect all users, initialize all its interfaces, and load the operating system software.

In some cases, when you make configuration changes, you may be required to restart for the changes to take effect.



Broadband Tab

Links available on the Broadband tab provide access to pages that allow you to view information about the broadband connection and configure connection details.

Link: Broadband Status

When you click the [Broadband](#) tab, the Broadband **Status** page is the first to appear.

Device	Broadband	Home Network	Voice	Firewall	Diagnostics
<div style="display: flex; justify-content: space-between; border-bottom: 1px solid #ccc; padding-bottom: 5px;"> Status Configure IGMP Stats </div>					
Broadband Status					
Broadband Connection Source		DSL			
Broadband Connection		Up			
Broadband IPv4 Address		10.13.211.30			
Gateway IPv4 Address		10.13.211.126			
MAC Address		74:f6:12:c5:6d:f1			
Primary DNS		10.13.193.1			
Secondary DNS		10.14.40.1			
Primary DNS Name					
Secondary DNS Name					
MTU		1500			
DSLAM Vendor ID		b5004244434da3db			
DSL Status					
	Line 1	Line 2			
Line State	Up	Up			
Downstream Sync Rate (kbps)	51456	48982			
Upstream Sync Rate (kbps)	15955	15198			
Downstream Max Attainable Rate (kbps)	52200	50106			
Upstream Max Attainable Rate (kbps)	7292	15332			
Modulation	VDSL2	VDSL2			
Data Path	Fast	Fast			
	Downstream	Upstream	Downstream	Upstream	
SN Margin (dB)	9.3	6.3	9.3	5.3	
Line Attenuation (dB)	3.4	2.4	1.5	2.8	
Output Power(dBm)	11.3	-25.9	11.3	-25.9	
Errored Seconds	2	439	0	150	
Loss of Signal	0	0	0	0	
Loss of Frame	0	0	0	0	
FEC Errors	34125	217473	0	1051882	
CRC Errors	2	2114	0	1174	
Timed Statistics					
	15 Min	Cur Day	Showtime	Last Showtime	Total
Errored Seconds (ES) Line 1	0	2	2	2	2
Errored Seconds (ES) Line 2	0	391	0	0	391
Severely Errored Seconds (SES) Line 1	0	0	0	0	0
Severely Errored Seconds (SES) Line 2	0	391	0	0	391
Unavailable Seconds (UASL) Line 1	0	83	0	0	83
Unavailable Seconds (UASL) Line 2	0	1774	0	0	1774
FEC Errors Line 1	0	34125	34125	34125	34125
FEC Errors Line 2	0	201	0	0	201
CRC Errors Line 1	0	2	2	2	2
CRC Errors Line 2	0	142687	0	0	142687
DSL Initialization Timeouts Line 1	0	0	0	0	0
DSL Initialization Timeouts Line 2	0	0	0	0	0

Aggregated Information	
Bonded Downstream Rate	100438
Bonded Upstream Rate	31153
IPv6	
Status	Unavailable
Global Unicast IPv6 Address	
Border Relay IPv4 Address	
IPv4 Statistics	
Transmit Packets	5701
Transmit Errors	0
Transmit Discards	0
Transmit Bytes	0
Receive Packets	6060
Receive Errors	0
Receive Discards	0
Receive Bytes	2661733
PTM Receive PDUs	6060
IPv6 Statistics	
Transmit Packets	0
Transmit Errors	0
Transmit Discards	0
Clear Statistics	

The **Status** page displays information about the NVG599 device's WAN connection(s) to the Internet.

Broadband Status

Broadband Connection Source	The communications technology providing the NVG599 broadband uplink.
Broadband Connection	May be Up (connected) or Down (disconnected).
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 device's unique hardware address identifier.
Primary DNS	The IP address of the primary Domain Name System (DNS) server.
Secondary DNS	The IP address of the backup DNS server, if available.
Primary DNS Name	The name of the primary DNS server.
Secondary DNS Name	The name of the backup DNS server, if available.
MTU	Maximum transmittable unit before packets are broken into multiple packets.

DSL Status (for each line)

Line State	May be Up (connected) or Down (disconnected).
Downstream Sync Rate	The rate at which your connection can download (receive) data on your DSL line, in kilobits per second.
Upstream Sync Rate	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 multi-tone) allows connections to work better when certain radio transmitters are present.
Data Path	Type of path used by the device's processor.

Downstream and Upstream Statistics (DSL WAN)

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 the device cannot sync with signal because of mismatched protocols, wrong ISP connection configuration, or faulty cable.
FEC Errors	Forwarded Error Correction errors. Count of received errored packets that were fixed successfully without a retry.
CRC Errors	Number of times data packets have had to be resent because of errors in transmission or reception.

Ethernet Statistics (Ethernet WAN)

Line State	Up or Down
Current Speed	Line speed
Current Duplex	Full- or half-duplex
Receive Packets	Number of packets received
Transmit Packets	Number of packets sent
Receive Bytes	Number of bytes received
Transmit Bytes	Number of bytes sent
Receive Unicast	Receive Unicast statistics
Transmit Unicast	Transmit Unicast statistics
Receive Multicast	Receive Multicast statistics
Transmit Multicast	Transmit Multicast statistics
Receive Drops	Received packets dropped
Transmit Drops	Sent packets dropped
Receive Errors	Count of received errored packets that were fixed successfully without a retry.
Transmit Errors	Number of times data packets have had to be resent due to errors in transmission.
Collisions	Count of packet collisions.

Aggregated Information

Bonded Downstream Rate	The bonded channel receive rate.
Bonded Upstream Rate	The bonded channel transmit rate.

IPv6

Status	May be Enabled or Unavailable.
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

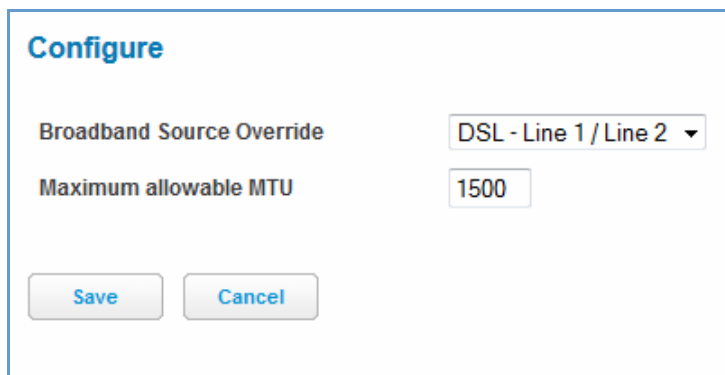
Transmit Packets	IPv4 packets transmitted.
Transmit Errors	Errors on IPv4 packets transmitted.
Transmit Discards	IPv4 packets dropped.

IPv6 Statistics

Transmit Packets	IPv6 packets transmitted.
Transmit Errors	Errors on IPv6 packets transmitted.
Transmit Discards	IPv6 packets dropped.

Link: Configure

When you click the [Configure](#) link, the Broadband **Configure** screen appears. Here you can reconfigure your type of broadband connection should it change in the future.



Configure

Broadband Source Override

Maximum allowable MTU

- ◆ **Broadband Source Override** - Auto (automatically detected), DSL - Line 1, DSL - Line 2, DSL - Line 1 / Line -2 (Bonded), or Ethernet WAN.
If you switch from DSL to Ethernet or from Ethernet to DSL, the device will proceed to reconnect as in its initial connection to the Internet, as described earlier. See [“Accessing the Web Management Interface” on page 21](#).
- ◆ The WAN connection is automatically configured. However, you can adjust the **Maximum allowable 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.

[Link: IGMP Stats](#)

When you click the [IGMP Stats](#) link, the **IGMP Stats** screen appears. The IGMP statistics screen reports IGMP proxy groups and multicast forwarding information. It also displays a packet counter.

The screenshot shows the IGMP Stats configuration page. It is divided into three main sections: Multicast, IGMP Snooping Statistics, and Summary.

IGMP Stats

Multicast

IGMP Querier Version	3
IGMP Robustness	2
IGMP Query Interval	125
IGMP Query Response Interval	100
IGMP Unsolicited Report Interval	10
IGMP Fast Leave Enable	on
IGMP Last Member Interval	10
IGMP Last Member Count	2
IGMP Maximum Group Memberships	20
IGMP Default Forward Allow	on
IGMP Snooping Entry Time	150
IGMP Snooping Unreg Mode	block
IGMP QoS ToS	0xc0
IGMP QoS P Bit	6
IGMP QoS Marker	
IGMP Proxy State	snoop fwd

IGMP Snooping Statistics

Port	Group	Source	Timeout
1	224.1.1.1	192.168.1.69	146.88

Summary

	Query	V1 Responses	V2 Responses	V2 Leaves	V3 Responses	Other
Received	0	0	0	0	17	0
Transmitted	11	0	0	0	0	0

Multicast Group Hosts

Group1/224.0.0.251	192.168.1.50	Interface br2
Group2/224.1.1.1	192.168.1.69	Interface br2

Home Network Tab

When you click the [Home Network](#) tab, the Home Network Status page appears.

Home Network Status

Device IPv4 Address 192.168.1.254
 DHCPv4 Netmask 255.255.255.0
 DHCPv4 Start Address 192.168.1.64
 DHCPv4 End Address 192.168.1.253
 DHCP Leases Available 185
 DHCP Leases Allocated 5
 DHCP Primary Pool Private

Interfaces

Interface	Status	Active Devices	Inactive Devices
Ethernet	Enabled	3	0
Wireless	Enabled	0	0
HPNA	Enabled	0	0

IPv6

Status Unavailable
 Global IPv6 Address /
 Link Local IPv6 Address
 Router Advertisement Prefix
 IPv6 WAN Address
 IPv6 Delegated LAN Prefix

IPv4 Statistics

Transmit Packets 35712
 Transmit Errors 0
 Transmit Discards 0

IPv6 Statistics

Transmit Packets 0
 Transmit Errors 0
 Transmit Discards 0

Wi-Fi Status

	2.4 Ghz Radio	5.0 Ghz Radio
Wi-Fi Radio Status	Enabled	Disabled
Mode	B/G/N	A/C
Bandwidth	40Mhz	40Mhz
Current Radio Channel	1	
Radio Channel Selection	automatic	fixed
MAC Address Filtering	Off	Off
Power Level	100%	100%
Wi-Fi MAC Address	74:7b:12:c5:6d:f0	
User SSID	on	on
Network Name (SSID)	NVG599-TEST	ATThd456
Hide Network Name (SSID)	Off	Off
Wi-Fi Security	WPA	WPA
Password	1111111111	1111111111
Guest SSID	off	
Network Name (SSID)	NVG599-TEST_Guest	
Hide Network Name (SSID)	Off	
Wi-Fi Security	WPA	
Password		

Wi-Fi Network Statistics

	2.4 Ghz Radio	5.0 Ghz Radio
Transmit Bytes	0	0
Receive Bytes	0	0
Transmit Packets	0	0
Receive Packets	0	0
Transmit Error Packets	0	0
Receive Error Packets	0	0
Transmit Discard Packets	240188	0
Receive Discard Packets	50916238	0

Wi-Fi Congestion

WARNING: Running the Congestion test will temporarily disconnect Wi-Fi users.

[Congestion Detection 2.4 Ghz Radio](#) [Congestion Detection 5.0 Ghz Radio](#)

The Home Network Status page displays information about the NVG599 device's local area network.

If you click the [Run Congestion Detection](#) button, the device will generate statistics for each of the 11 channels available, displaying:

- ◆ Channel number
- ◆ AP (access point) count
- ◆ Congestion score (1 - 10) - Note that higher values mean lower congestion.

The wireless congestion feature provides simple data to the user to show the level of network congestion in each wireless channel. This data can be used to determine router placement or to determine which channels to avoid.

The display tells the user how many access points (APs) are active within each channel, and provides a score of 1 - 10 to indicate how clear the channel is. A higher score indicates less congestion in a channel; thus, a 10 indicates a channel extremely clear of wireless traffic and noise. Alternatively, a score of 1 indicates more severe congestion in a channel.

You can clear the current statistics information by clicking the [Clear Statistics](#) button.

Wi-Fi Client Connection Statistics

MAC Address	Timestamp	State	Access Point	Authentication
LAN Ethernet Statistics				
State	Port 1	Port 2	Port 3	Port 4
	down	up	down	down
Transmit Speed	0	1000000000	0	0
Transmit Packets	0	15369	0	0
Transmit Bytes	0	4899556	0	0
Transmit Dropped	0	0	0	0
Transmit Errors	0	0	0	0
Receive Packets	0	11208	0	0
Receive Bytes	0	2010146	0	0
Receive Unicast	0	9647	0	0
Receive Multicast	0	892	0	0
Receive Dropped	0	0	0	0
Receive Errors	0	28	0	0

[Clear Statistics](#)

Home Network Status

Device IPv4 Address	The NVG599 device's own IP address on the network.
DHCP Netmask	The device's own netmask on the network.
DHCPv4 Start Address	The starting IP address of the DHCP range served by the device.
DHCPv4 End Address	The ending IP address of the DHCP range served by the device.
DHCP Leases Available	The number of IP addresses of the DHCP range available to be served by the device.
DHCP Leases Allocated	The number of IP addresses of the DHCP range currently being served by the device.
DHCP Primary Pool	Source pool of the IP addresses served by the NVG599 device, Public or Private.

IPv6

Status	May be Enabled or Unavailable .
Global IPv6 Address	The public IPv6 address of your device, whether dynamically or statically assigned.
Link-local 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.
IPv6 Delegated LAN Prefix	The IPv6 network address prefix that identifies the NVG599 network.

IPv4 Statistics

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

IPv6 Statistics

Transmit Packets	IPv6 packets transmitted.
Transmit Errors	Errors on IPv6 packets transmitted.
Transmit Discards	IPv6 packets dropped.

WiFi Status

WiFi Radio Status	Status of the Wi-Fi radio: Enabled or Disabled .
Mode	May be 802.11B only, 802.11G only, 802.11N only, 802.11 B/G or 802.11 B/G/N . For the 5.0 Ghz radio, may be 802.11AC as well.
Bandwidth	The capacity of the wireless LAN to carry traffic in megahertz.
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.
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.
WiFi MAC Address	Shows the information of the MAC address of the wireless subsystem.
User SSID	May be either On or Off for either frequency.
Guest SSID	May be either On or Off for the 2.4 Ghz radio only.
Network Name (SSID)	The name or ID that is displayed to a client scan. The default SSID for the NVG599 is attxxx where xxx is the last 3 digits of the serial number located on the side of the NVG599 device.
Hide SSID	May be either On or Off . If On, your SSID will not appear in a client scan.
Wireless Security	The type of wireless encryption security in use. May be Disabled , WPA , WEP , Default Key , or Manual .

Password	Shows the information of the security encryption key in use.
----------	--

WiFi Network Statistics

Transmit Bytes	Number of bytes transmitted on the Wi-Fi network.
Receive Bytes	Number of bytes received on the Wi-Fi network.
Transmit Packets	Number of packets transmitted on the Wi-Fi network.
Receive Packets	Number of packets received on the Wi-Fi network.
Transmit Error Packets	The number of errors on packets transmitted on the Wi-Fi network.
Receive Error Packets	The number of errors on packets received on the Wi-Fi network.
Transmit Discard Packets	The number of packets transmitted on the Wi-Fi network that were dropped.
Receive Discard Packets	The number of packets received on the Wi-Fi network that were dropped.

LAN Ethernet Statistics

State	May be Up or Down.
Transmit Speed	The maximum speed of which the port is capable.
Transmit Packets	The number of packets sent out from the port.
Transmit Bytes	The number of bytes sent out from the port.
Transmit Dropped	The number of packets sent out from the port that were dropped.
Transmit Errors	The number of errors on packets sent out from the port.
Receive Packets	The number of packets received on the port.
Receive Bytes	The number of bytes received on the port.
Receive Unicast	The number of unicast packets received on the port.
Receive Multicast	The number of multicast packets received on the port.
Receive Dropped	The number of packets received on the port that were dropped.
Receive Errors	The number of errors on packets received on the port.

The links at the top of the Home Network page provide access to a series of pages that allow you to configure and monitor features of your device.



The links bar on the Home Network page includes the following links. For more information about each link, see the related section in this guide.

- ◆ **Configure** (see [page 42](#))
- ◆ **HPNA Configure** (see [page 42](#))
- ◆ **Wifi** (see [page 43](#))
- ◆ **MAC Filtering** (see [page 46](#))
- ◆ **Wireless Scan** (see [page 47](#))
- ◆ **Subnets & DHCP** (see [page 47](#))
- ◆ **IP Allocation** (see [page 49](#))
- ◆ **HPNA** (see [page 51](#))

[Link: Configure](#)

When you click the [Configure](#) link, the **Configure** page for the Ethernet LAN appears.

The screenshot shows a configuration window titled "Configure". It contains two rows of settings for four ports (Port 1, Port 2, Port 3, Port 4). The first row is labeled "Ethernet" and the second row is labeled "MDI-X". Each port has a dropdown menu, all of which are currently set to "Auto". At the bottom of the window, there are two buttons: "Save" and "Cancel".

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**.

Click the [Save](#) button.

[Link: HPNA Configure](#)

When you click the [HPNA Configure](#) link, the **HPNA Configure** page for the HomePNA network appears.

The screenshot shows a configuration window titled "HPNA Configure". At the top, there is a warning message: "Warning: If you are an IPTV user do not disable HPNA unless instructed to do so as this action may cause disruption of services." Below the warning, there are two settings: "HomePNA Networking" with a dropdown menu set to "On", and "Output Jack" with a dropdown menu set to "Coax". At the bottom, there are two buttons: "Save" and "Cancel".

Here you can set HomePNA Networking **On** or **Off**.

This screenshot is similar to the previous one, but the "Output Jack" dropdown menu is open, showing three options: "Coax", "Coax", and "Phone". A mouse cursor is pointing at the "Phone" option.

If desired, you can also set the Output Jack, as either the **Coax** jack or the **Phone** jack.

Click the [Save](#) button.

Link: WiFi

When you click the [WiFi](#) link, the WiFi page appears. The WiFi page displays the status of your wireless LAN elements.

The screenshot shows the WiFi configuration interface. It is divided into three main sections: Radio Selection, User SSID, and Guest SSID. Each section contains various settings such as enable/disable options, network names, security protocols, and WPA versions. At the bottom, there are 'Save' and 'Cancel' buttons, and a section for entering a WPS PIN with 'Submit to User SSID' and 'Submit to Guest SSID' buttons.

Field	Value
Radio Selection	2.4 Ghz Radio
Wi-Fi Operation	On
Mode	B/G/N
Bandwidth	20MHz
Channel	Automatic
Power Level (1-100%)	100
User SSID	
User SSID Enable	On
Network Name (SSID)	NVG599-TEST
Hide Network Name (SSID)	Off
Security	WPA - Default Password
WPA Version	Both
WEP Password Length	10 characters (40/64 bits)
Password	1111111111
Wi-Fi Protected Setup (WPS)	Off
Guest SSID	
Guest SSID Enable	Off
Guest Network Name	NVG599-TEST_Guest
Hide Network Name (SSID)	Off
Security	WPA - PSK
WPA Version	Both
WEP Password Length	10 characters (40/64 bits)
Password	
Wi-Fi Protected Setup (WPS)	Off

The WiFi page center section contains a summary of the configuration settings and operational status for the wireless access point.

Summary Information

Field	Status and/or Description
Radio Selection	Display the settings for either the 2.4 Ghz or the 5.0 Ghz frequency radio.
WiFi Operation	May be either On or Off .
Mode	Wireless transmission mode. For the 2.4 Ghz radio, may be 802.11B only, 802.11G only, 802.11N only, 802.11 B/G or 802.11 B/G/N . For the 5.0 Ghz radio, may be 802.11AC as well.
Bandwidth	The capacity of the wireless LAN to carry traffic in megahertz, 20 or 40 .
Channel	The radio channel on which your Wi-Fi network is broadcasting.
Power Level	May be adjusted up to 100%, lower if multiple wireless access points are in use, and might interfere with each other.
User SSID Enable	May be either On or Off for either frequency.
Guest SSID Enable	May be either On or Off for the 2.4 Ghz radio only.
Network Name (SSID)	The name or ID that is displayed to a client scan. The default SSID for the NVG599 is attxx where xxx is the last 3 digits of the serial number located on the side of the device.
Hide SSID	May be either Off or On . If On , 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 , 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.
WiFi Protected Setup (WPS)	May be either On or Off.

General Information

- ◆ **WiFi Operation** – Automatically enabled by default. If you deselect the checkbox, the WiFi options are disabled, and the wireless access point will not provide or broadcast its wireless LAN services.
- ◆ **Mode** – The drop-down menu allows you to select and lock the NVG599 into the wireless transmission mode you want: **A/C, 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 the option 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** – Use a single 20-MHz channel (**20MHz** setting), or combine two 20-MHz channels (**40MHz** setting) to increase data speeds. The 40-MHz mode may only be selected if the **Mode** setting is 801.11 **B/G/N** or 802.11 **N-Only**. To prevent interference with lower bandwidth clients, the wireless network will revert to 20MHz operation if non-compatible (802.11**B**, 802.11**G**, or 20-MHz 802.11**N**) clients are detected.
- ◆ **Channel** – Channel (1 through 11, for North America) on which the network will broadcast. This is a frequency range within the 2.4-GHz or 5.0-GHz band. The **Automatic** setting allows the wireless access point to automatically determine the best channel for broadcast.
- ◆ **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 cell to match the location. This allows you to install a router to cover a small "hole" without conflicting with other routers nearby.
- ◆ **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 "Brian's Wireless LAN." In client PC software, this might also be called the wireless ID. The Network Name 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.
 - 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. Hiding the SSID prevents casual detection of your wireless network by unwanted neighbors and passers-by. The gateway WLAN will not appear when clients scan for access points. If Hide SSID is enabled, you must remember to enter your SSID when adding clients to the wireless LAN.



NOTE:

While hiding the SSID may prevent casual discovery of your wireless network, enabling security is the only true method of securing your network.

- ◆ **Security, WPA Version, WEP Key Length, Key** – See ["Wireless Security" on page 45.](#)
- ◆ **WiFi Protected Setup (WPS)** – Not a security protocol. WPS is an easier way to add and securely configure new clients to your WLAN. By default, Privacy is set to WiFi Protected Access (WPA-PSK) with a 12-character security key. WPS allows you to securely share your exact security configuration with a new client that you are adding to the WLAN, without needing to look up and type this security key. Clients can be added using the WPS button on the router, or by entering the client WPS PIN on this page. Not all client wireless devices support WPS. Refer to their documentation.
To add a client: Enter your **WPS PIN** and click the **Submit** button. Follow the instructions that came with your wireless client.

Wireless Security

By default, wireless security is set to **WPA-PSK** with a pre-defined **WPA-Default Key**.

User SSID

User SSID Enable: On

Network Name (SSID): ATThd456

Hide Network Name (SSID): Off

Security: WPA-PSK

WPA Version: Both

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

Password: 1111111111

Wi-Fi Protected Setup (WPS): Off

Save Cancel

Enter the Wi-Fi Client's all digit PIN, click the Submit button associated with the SSID you want to use, then follow the Wi-Fi client instructions.

WPS PIN: Submit to User SSID

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

- ◆ **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. For WEP-Manual 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 45](#).



NOTE:

WEP is a less current and less secure authentication method than WPA-PSK. It may be required if your wireless clients do not support WPA.

- ◆ **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** drop-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 securityAll 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:** Disables privacy on your network, allowing any wireless users to connect to your wireless LAN. Select 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.



NOTE:

WEP is a less current and less secure authentication method than WPA-PSK. It may be required if your wireless clients do not support WPA.

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 drop-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 must 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 [Save](#) button.

[Link: MAC Filtering](#)

When you click the [MAC Filtering](#) link the MAC Filtering page appears.

MAC Filtering

2.4 GHz Radio
User SSID Filtering: Blacklist
Guest SSID Filtering: Whitelist

5.0 GHz Radio
User SSID Filtering: Blacklist

Save Cancel

MAC Filter List

MAC	IP Address/Name	2.4 GHz User	2.4 GHz Guest	5.0 GHz User	Delete MAC from All SSID Lists
00:08:24:23:44:21		allowed	allowed	allowed	Delete
00:08:01:15:01:02		allowed	allowed	allowed	Delete
00:08:06:16:65:48		allowed	allowed	allowed	Delete

MAC Filter Entry

Please choose from the Device List or enter a MAC Address manually and click "Add"

MAC Address: No MACs Found
Manual Entry:
2.4 GHz User:
2.4 GHz Guest:
5.0 GHz User:

Add

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 **MAC Address** drop-down list 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	IP Address/Name	2.4Ghz User	2.4Ghz Guest	5.0Ghz User	Delete MAC from All SSID Lists
00:08:24:23:44:21		allowed	allowed	allowed	Delete
00:08:01:15:01:02		allowed	allowed	allowed	Delete
00:08:06:16:65:48		allowed	allowed	allowed	Delete

◆ Click the [Save](#) button.

You can add or delete any of your entries later by returning to this page.

[Link: Wireless Scan](#)

Your device automatically checks for the best channel to broadcast wireless services. However, in some cases it may be useful to switch to a different channel (1 through 11, for North America) on which the network will broadcast.

Wi-Fi Scan

Warning: The Wi-Fi Channel Scan is an invasive test. Client devices may be temporarily disconnected from Wi-Fi service while the test is performed.

[Scan 2.4 GHz Radio](#) [Scan 5.0 GHz Radio](#) [Cancel](#)

The scan covers a frequency range within the 2.4 Ghz or 5.0 Ghz 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 device. You need not select a channel at any of the computers on your wireless network. They will automatically scan available channels seeking a wireless device broadcasting on the SSID for which they are configured.

This scan will disconnect any wireless client devices from the wireless network.

If you want to scan for a different channel on which the device will broadcast, click the [Continue](#) button.

[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

DHCP Server

DHCPv4 Start Address: 192.168.1.64
 DHCPv4 End Address: 192.168.1.253
 DHCP Lease: Days: 1, Hours: 0, Minutes: 0, Seconds: 0

Public Subnet

Public Subnet Mode: Off
 Allow Inbound Traffic: Off
 Public IPv4 Address:
 Public Subnet Mask: 255.255.255.0
 DHCPv4 Start Address:
 DHCPv4 End Address:
 Primary DHCP Pool: Private Public

Cascaded Router

Cascaded Router Enable: On
 Cascaded Router Address:
 Network Address:
 Subnet Mask: 255.255.255.248

Save Cancel

The server configuration determines the functionality of your DHCP settings. This functionality enables the NVG599 to assign your LAN computer(s) a “private” IP address and other parameters that allow network communication. This feature simplifies network administration because the NVG599 maintains a list of IP address assignments. Additional computers can be added to your LAN without the need to configure an IP address. This is the default mode for your NVG599 device.

Private LAN Subnet

- ◆ **Device IPv4 Address:** The IP address of your device as seen from the LAN.
- ◆ **Subnet Mask:** Subnet mask of your LAN.

DHCP

- ◆ **DHCPv4 Start Address:** First IP address in the range being served to your LAN by the NVG599 DHCP server.
- ◆ **DHCPv4 End Address:** Last IP address in the range being served to your LAN by the NVG599 DHCP server.
- ◆ **DHCP Lease:** Specifies the default length for DHCP leases issued by the router. Enter lease time in *dd:hh:mm:ss* (days/hours/minutes/seconds) format.

Public Subnet

- ◆ **Public Subnet Enable:** If you select **On** from the drop-down menu, you can enable a second subnet to distribute public addresses to DHCP clients; this means that IP addresses assigned to LAN clients will be public addresses.
- ◆ **Public IPv4 Address:** The IP address of your NVG599 device as seen from the WAN.
- ◆ **Public 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.
- ◆ **Primary DHCP Pool:** Choose the source of the DHCP pool IP address assignment by selecting either **Private** (local to your LAN) or **Public** (assigned remotely).

Cascaded Router

- ◆ **Cascaded Router Enable:** If you have another router behind this device, choose **On** from the drop-down menu.
- ◆ **Cascaded Router Address:** If you chose **On** from the drop-down menu, enter the IP address of the router you are using behind this device in the LAN private IP subnet range.
- ◆ **Network Address:** If you chose **On** from the drop-down menu, enter the Network Address that defines the range of IP addresses available to clients of the router you are using behind this device.
- ◆ **Subnet Mask:** If you chose **On** from the drop-down menu, enter the subnet mask for the network address that defines the range of IP addresses available to clients of the router you are using behind this device.

If you make any changes here, click the [Save](#) button, and if prompted, restart the NVG599 device.

Link: IP Allocation

When you click the [IP Allocation](#) link, the IP Allocation page appears.

IPv4 Address / Name	MAC Address	Status	Allocation	Action
192.168.1.64 / E51311-04	00:1e:ec:1b:eb:5b	on	DHCP Allocation	Allocate

Help
 The IP Allocation table lists DHCP clients and IP Allocated clients. You may want to create an IP Allocated client so that it will always get the same IP address. The IP Allocated clients are still configured as DHCP clients at the client end, but will always be served the same IP address by the device DHCP server.
 To create an IP Allocated client select the Allocate button next to the client. The IP Allocation Entry section appears. Choose a Fixed address for the client and click "Save".
 To change an IP Allocated client back to a normal DHCP client select it and click "Allocate". Then in the IP Allocation Entry section select "Address from DHCP pool" and click "Save".
 Sometimes the lease and the LAN Host Discovery table will not change immediately. You may have to renew the lease or request service at the client for the change to complete.



NOTE:

IP Allocation functions require you to enter your NVG599 Gateway's access code. Information on the device code is provided in ["Device Access Code" on page 24](#)

The IP Allocation page lets you set aside or assign IP addresses to client devices on your network. With IP allocation, you can configure known devices to either use DHCP for dynamic IP address assignment, or set aside a specific IP address for a client device. When IP allocation is enabled for a client, that device is assigned a pre-determined IP address by the DHCP server of the NVG599. IP allocation lets you set up client devices as common DHCP systems, but ensures that they always receive the same IP address from the gateway.

The IP Allocation table shows a list of all identified and active client devices the NVG599 is serving.

To change the allocation method used by a client:

1. Locate the client in the IP Allocation table. The client may be identified by the *Name* value (in the *IPv4 Address/Name* column) or the device MAC address.
2. Click the [Allocate](#) button associated with the client entry.

The IP Allocation window for the client opens.

The screenshot shows the 'IP Allocation' window. At the top, there is a table with the following data:

IPv4 Address / Name	MAC Address	Status	Allocation	Action
192.168.1.64 / E51311-04	00:1e:ec:16:eb:f6	on	DHCP Allocation	<input type="button" value="Allocate"/>

Below the table is the 'IP Allocation Entry' section. It contains the following fields:

- IPv4 Address / Name: 192.168.1.64/E51311-04
- MAC Address: 00:1e:ec:16:eb:f6
- Current Allocation: DHCP Allocation
- New Allocation: A dropdown menu with the following options:
 - Private fixed: 192.168.1.245
 - Private fixed: 192.168.1.246
 - Private fixed: 192.168.1.247
 - Private fixed: 192.168.1.248
 - Private fixed: 192.168.1.249
 - Private fixed: 192.168.1.250
 - Private fixed: 192.168.1.251
 - Private fixed: 192.168.1.252

At the bottom of the window are two buttons: 'Save' and 'Cancel'.

3. Scroll through the **New Allocation** values and select the address or method to use for the client's DHCP assignment:
 - Click **Address from DHCP Pool** to set the client to accept any valid DHCP address available (standard operation).
 - Click any of the private fixed IP addresses (192.168.1.64 to 192.168.1.253) shown in the list to allocate that IP address to the selected client.
4. Click the **Save** button to save the IP allocation settings. A red "Changes saved" message appears at the top of the IP Allocation page.

Link: HPNA

When you click the [HPNA](#) link, the HPNA Network page appears.

HPNA Network

Firmware Version 1.0.4 D-UcVt-9-4-27111005-ATT.bin
Firmware Signature 089E9A671CFC31620117D443F1536DDC
HPNA Physical Link DOWN
Network Mode SYNCHRONOUS

NodeID	MTU	MAC Address
1	14000	74:16:12:c5:49:a2

[Home Network Performance Management Data](#) [Run extended Test](#)

Data Collection Time

Station-to-Station performance	PHY Rate	SNR	Rx Power Level	Packet Error
--------------------------------	----------	-----	----------------	--------------

[HomePNA Statistics](#) [Refresh](#)

Station ID	1
Local	Local
HPNA MAC Address	74:16:12:c5:49:a2
HPNA Firmware (C-coax, T=TP)	C
HPNA Version	1.0.4 Aug 30 2011
HPNA Master	#

Start	01:30:55
Stop	01:30:55
Short Tx Pkt	0
Short Rx Pkt	0
CRC Errors Rx	0
Dropped Tx	0
Dropped Rx	0
Tx Error %	0
Rx Error %	0
Frames Tx	1280
Frames Rx	529
Bytes Tx	87720
Bytes Rx	39076
Unicast Tx	529
Unicast Rx	
Multicast Tx	0
Multicast Rx	0
Local Control Req	529
Local Control Repl	529
Remote Control Req	0
Remote Control Repl	0

Start	01:15:55
Stop	01:30:55
Short Tx Pkt	0
Short Rx Pkt	0
CRC Errors Rx	0
Dropped Tx	0
Dropped Rx	0
Tx Error %	0
Rx Error %	0
Frames Tx	1288
Frames Rx	529
Bytes Tx	87720
Bytes Rx	39076
Unicast Tx	4284966997
Unicast Rx	
Multicast Tx	820
Multicast Rx	0
Local Control Req	529
Local Control Repl	529
Remote Control Req	0
Remote Control Repl	0

The HPNA Network page displays information about the NVG599 gateway's HPNA-connected devices in 15-minute intervals. You can test the performance of each station to station pair by clicking the [Run extended Test](#) button.

The following page appears as a warning about this invasive test.

HPNA Extended Test

Warning: Running an Extended Test will interrupt HPNA, disrupting any video, and potentially other services.

You may lose connectivity to this display during that time.
Do you wish to continue?

[Continue](#) [Cancel](#)

If you do not run the extended test, the station-to-station performance section is not displayed.

You can generate updated statistics by clicking the [Refresh](#) button.

HomePNA statistics for the current and previous intervals are displayed below the following static values:

- ◆ Station ID
- ◆ HPNA MAC Address
- ◆ HPNA Firmware (C-coax, T=TP)
- ◆ HPNA Version
- ◆ HPNA Master

Interval statistic fields supply the following information:

Label	Statistic Displayed
Short Tx Pkt	Transmitted Packets
Short Rx Pkt	Received Packets
CRC Errors Rx	Receipt errors
Dropped Tx	Transmit packets dropped
Dropped Rx	Receipt packets dropped
Tx Error %	Percentage of transmitted errors
Rx Error %	Percentage of receipt errors
Frames Tx	Number of frames transmitted
Frames Rx	Number of frames received
Bytes Tx	Bytes transmitted
Bytes Rx	Bytes received
Unicast Tx	Number of unicast packets transmitted
Unicast Rx	Number of unicast packets received
Multicast Tx	Number of multicast packets transmitted
Multicast Rx	Number of multicast packets received
Local Control Req	Number of requests made to the device by local control
Local Control Repl	Number of replies made by the device to local control
Remote Control Req	Number of requests made to the device by remote control
Remote Control Repl	Number of replies made by the device to remote control

Voice

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

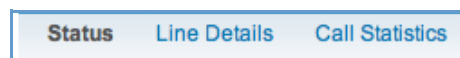
	Line 1	Line 2
Phone Number	Not Subscribed	Not Subscribed
Registration State	Down	Down
Line State	Idle	Idle

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

Voice-over-IP (VoIP) refers to voice telephone calls transmitted over the Internet. This type of service differs from traditional phone service that uses 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 device 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 Details**.

The links at the top of the Voice page provide access to a series of pages that allow you to configure and monitor features of your device.

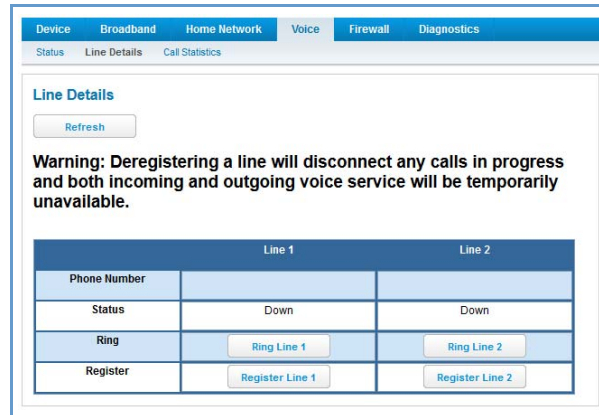


The links bar on the Voice page includes the following links. For more information about each link, see the related section in this guide.

- ◆ **Line Details** (see [page 54](#))
- ◆ **Call Statistics** (see [page 55](#))

Link: Line Details

When you click the [Line Details](#) link, the Line Details page appears.



- ◆ 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.
- ◆ To test if the lines are enabled, click the [Ring Line 1](#) or [Ring Line 2](#) button. If enabled and registered, the respective phone will ring for 30 seconds.
- ◆ To clear the current state of each phone line, click the [Reset Line 1](#) or [Reset Line 2](#) button. This will disconnect any calls currently in progress as well.
- ◆ To update the display, click the [Refresh](#) button.

[Link: Call Statistics](#)

When you click [Call Statistics](#), the Call Statistics page appears.

Line 1	Last Call		Cumulative	
	Incoming	Outgoing	Incoming	Outgoing
RTP Packet Loss	0	0	0	0
RTP Packet Loss percentage	0.00%	0.00%	0.00%	0.00%
Total RTCP Packets	0	0	0	0
Average Inter Arrival Jitter (in ms)	0	0	0	0
Max Inter Arrival Jitter (in ms)	0	0	0	0
Sum of Inter Arrival Jitter (in ms)	0	0	0	0
Sum of Inter Arrival Jitter Squared (in ms)	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 (in ms)	0	0	0	0
Sum of One Way Delay (in ms)	0	0	0	0
Sum of One Way Delay Squared	0	0	0	0
Avg Round Trip Time (in ms)	0	0	0	0
Max Round Trip Time (in ms)	0	0	0	0
Sum of Round Trip Time (in ms)	0	0	0	0
Sum of Round Trip Time Squared	0	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 – Incoming/Outgoing	
RTP Packet Loss	Real-time Transport Protocol packets dropped
RTP Packet Loss percentage	Percent of Real-time Transport Protocol packets dropped
Total RTCP Packets	Total Real-time Transport Control Protocol packets
Average Inter Arrival Jitter	Calculated continuously in milliseconds as each data packet is received and averaged.
Max Inter Arrival Jitter	The maximum value in milliseconds recorded as each data packet is received.
Sum of Inter Arrival Jitter	Calculated continuously in milliseconds as each data packet is received and totalled.
Sum of Inter Arrival Jitter Squared	Calculated continuously in milliseconds 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 number 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 values will give the Sum of Franc Loss Squared.
Max One Way Delay	One-way delay will be calculated in milliseconds on every RTCP SR or RR packet. This value is $(systime - lsr - dslr) / 2$ <i>lsr</i> means last SR timestamp <i>dslr</i> means delay since last SR.
Sum of One Way Delay	The sum of all the one-way delays calculated in milliseconds 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 values will give the Sum of One Way Delay Squared.
Avg Round Trip Time	Average time in milliseconds from this local source to destination address and back again for all logged calls
Max Round Trip Time	Maximum amount of time in milliseconds from this local source to destination address and back again for all logged calls
Sum of Round Trip Time	Sum of time in milliseconds 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 (in secs)	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	0	0
Duration (in secs)	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 in seconds 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 in seconds 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

The following table shows VoIP line states during various conditions.

VoIP Line 1/2	Hook state	WAN IP	Reg-state	FXS Voltage	Tone	LED
Disabled	On/Off-hook	Up	Idle	Off	N/A	Off
Enabled	On-hook	Up	Registered	On	N/A	Solid
Enabled	Off-hook	Up	Registered	On	Dial tone	Blink
Enabled	On/Off hook	Up	Failure	Off	N/A	Off
Enabled	On/Off hook	Down	Idle	Off	N/A	Off

The following table provides the state changes during the boot-up procedure.

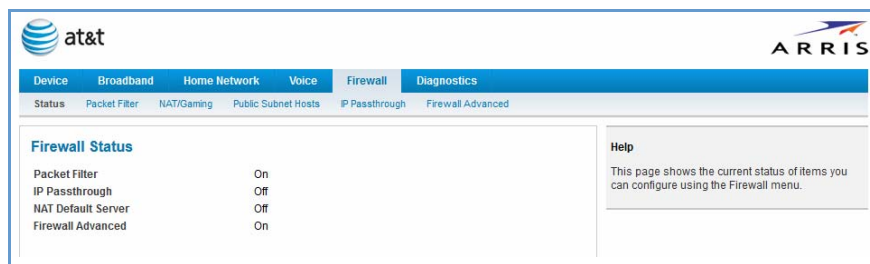
VoIP Line 1/2	WAN Status	Hook State	Reg-state	FXS Voltage	Tone	LED
Disabled	Down	Off-hook	Idle	On-to-off	Off	Off
Enabled	Down	On/Off-hook	Idle	On	Congestion	Off
Enabled	Up	Off-hook	Registered	On	Congestion. Dial Tone played after the hook state is changed.	On

Firewall

When you click the [Firewall](#) tab, the Firewall Status page appears. The Firewall page displays the status of your system firewall elements.

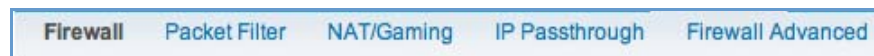
All computer operating systems are vulnerable to attack from outside sources, typically at the operating system or Internet Protocol (IP) layers. Stateful Inspection firewalls intercept and analyze incoming data packets to determine whether they should be admitted to your private LAN, based on multiple 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 network address translation (NAT) is disabled. You can configure UDP and TCP “no-activity” periods that will also apply to NAT timeouts 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.



The Firewall Status page shows whether the each firewall feature is On or Off.

The links at the top of the Firewall page provide access to series of pages that allow you to configure security features of your device.

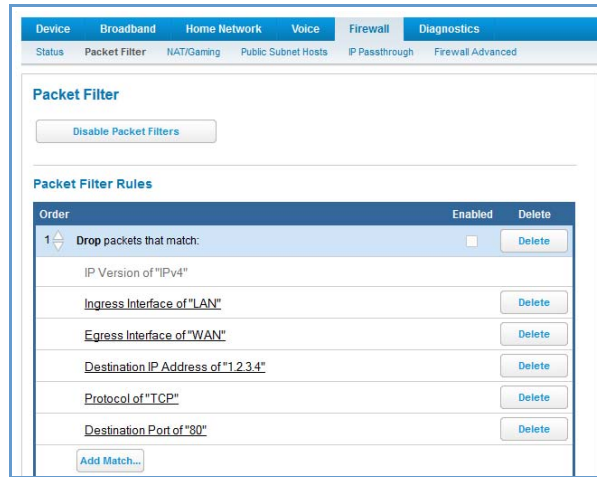


The links bar on the Firewall page includes the following links. For more information about each link, see the related section in this guide.

- ◆ [Packet Filter](#) (see [page 60](#))
- ◆ [NAT/Gaming](#) (see [page 67](#))
- ◆ [IP Passthrough](#) (see [page 73](#))
- ◆ [Firewall Advanced](#) (see [page 76](#))

[Link: Packet Filter](#)

When you click the [Packet Filter](#) link, the Packet Filter page appears.



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 ARRIS NVG599 device incorporating NAT has advanced security features built in. Improperly adding filters and filtersets increases the possibility of loss of communication with the device and the Internet. Never attempt to configure filters unless you are local to the NVG599 device.

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.

ARRIS's packet filters are designed to provide security for the Internet connections made to and from your network. You can customize the NVG599 device'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 firewalls 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:

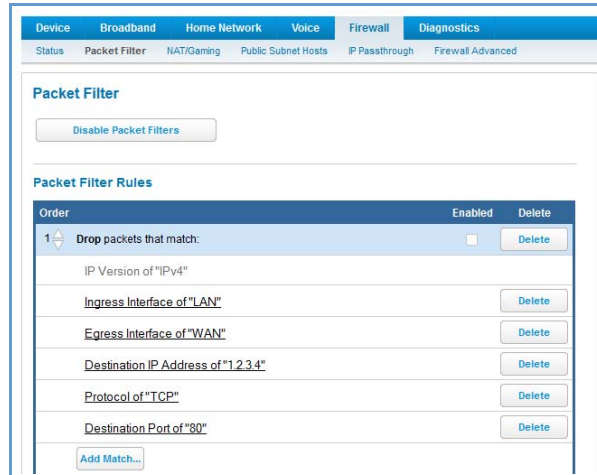
- ◆ That which is not expressly prohibited is permitted.
- ◆ That which is not expressly permitted is prohibited.

We strongly recommend that you take the latter, and safer, approach to all of your filterset designs.

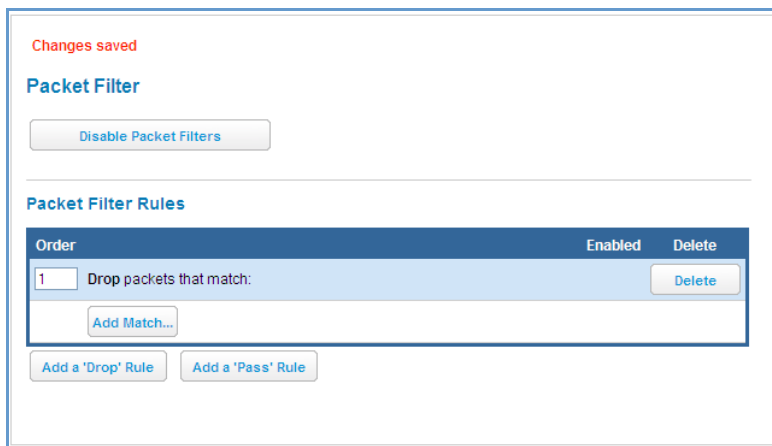
Working with Packet Filters

To work with filters:

1. Accessing the Packet Filter page by clicking the Packet Filter link.



2. Globally turn filters on or off by clicking the [Enable/Disable Packet Filters](#) button.
3. Select the type of packet filter rule by clicking either the [Add a 'Drop' Rule](#) or [Add a 'Pass' Rule](#) button.
 - If you select a drop rule, the specified packets will be blocked.
 - If you select a pass rule, the specified packets will be forwarded.



4. Click the **Add Match** button to enter the source IP address or destination IP address this filter will match on. As you create new matches, the list items change. There can only be one match from each match type for a given rule. Match types like **Source Port**, **Destination Port**, and **TCP Flags** are only available if other matches (for example, **Protocol =TCP**) have previously been created.
5. Select a protocol, if necessary, from the pull-down menu: **ICMP**, **TCP**, **UDP**, or **None** to specify any another IP transport protocol.
 - If you chose **by number**, enter the **Protocol by number** here.
 - If you chose **by name**, enter the **Protocol by name** here.
 - 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 [Enter Match](#) button.

The filter is automatically saved.

Packet Filter Rules List

Your entries to the packet filter rules list are displayed as a table.



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 NVG599 device itself.

Example:

Assume a configured Custom Service/Hosted Application for an internal web server whose global port range is 8080-8080. Also assume that we want to allow only one external subnet access to this internal server: 207.53.17.0/24. And finally, assume that we want to disallow one IP address on that subnet, 207.53.17.9, from access to that same server (perhaps they were abusing the system in some way). We would need the following rules:

Input Rules						
Rule Order	Action	Source IP	Destination IP	Protocol	Source Port	Destination Port
1	Drop	207.53.17.9	-	TCP		8080
2	Pass	207.53.17.0/24	-	TCP		8080
3	Drop	-	-	TCP		8080

Changes saved

Packet Filter

Disable Packet Filters

Packet Filter Rules

Order	Enabled	Delete
1	<input checked="" type="checkbox"/>	Delete
Drop packets that match:		
Source IP Address of "207.53.17.9"		
Add Match...		
2	<input checked="" type="checkbox"/>	Delete
Pass packets that match:		
Source IP Address of "207.53.17.0/24"		
Add Match...		

Update Order Add a 'Drop' Rule Add a 'Pass' Rule



Caution:

If the packet filter or port forwarding rule involves TCP port 80 or 3389; or UDP port 47806, 43962, 69, 123, or 53; or if you attempt to add or change a match such that this occurs and you are running in VDSL/Ethernet mode, the following warning will appear.

Warning

Warning: The change you are attempting to make may cause AT&T U-verse TV to stop working properly.

Please select "Confirm" to continue with the change, or "Cancel" to revert the change.

Confirm Cancel

Example 2

The following example uses the GUI to detail how to create a public subnet.

1. Select **Home Network** -> **Subnets & DHCP** from the Web management GUI.

The screenshot shows the 'Subnets & DHCP' configuration page. The 'Public Subnet' section is active, with the following settings:

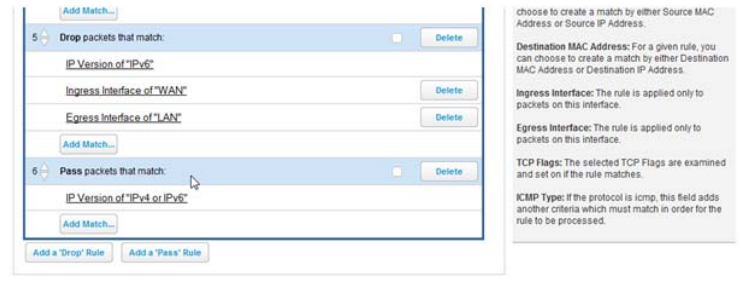
- Public Subnet Mode: On
- Allow Inbound Traffic: Off
- Public IP Address: (empty)
- Public Subnet Mask: 255.255.255.0
- DHCPv4 Start Address: (empty)
- DHCPv4 End Address: (empty)
- Primary DHCP Pool: Public

2. Select On from the **Public Subnet Enable** drop-down menu.
3. Enter all applicable public subnet IP address information and select Save at the bottom of the view.
4. Select **Firewall** -> **Packet Filter** to create a packet filter that will allow specific traffic to flow to a public LAN client.

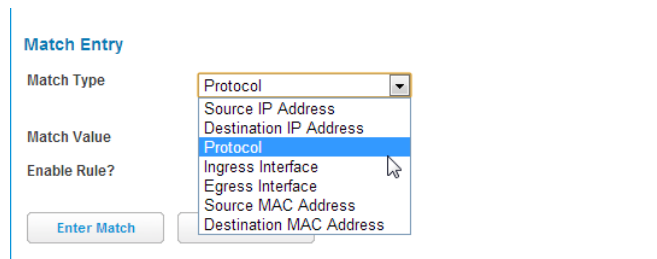
The screenshot shows the 'Packet Filter' configuration page. The 'Packet Filter Rules' table is as follows:

Order	Enabled	Delete
1	<input type="checkbox"/>	Delete
Drop packets that match:		
IP Version of "IPv4"		
Ingress Interface of "LAN"		
Egress Interface of "WAN"		
Destination IP Address of "1.2.3.4"		
Protocol of "TCP"		
Destination Port of "80"		
Add Match...		

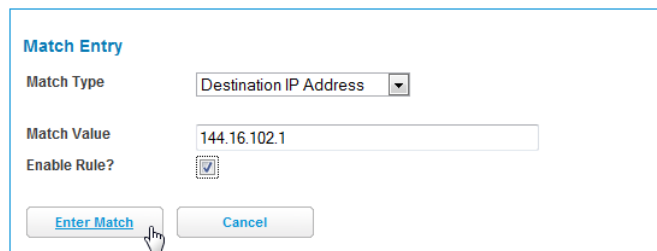
5. Scroll to the bottom of the screen and select **Add a Pass Rule**. This rule will allow traffic to flow through the public subnet based on the match criteria that will be set up next. The new rule will be at the bottom of the **Packet Rules** list (as shown below).



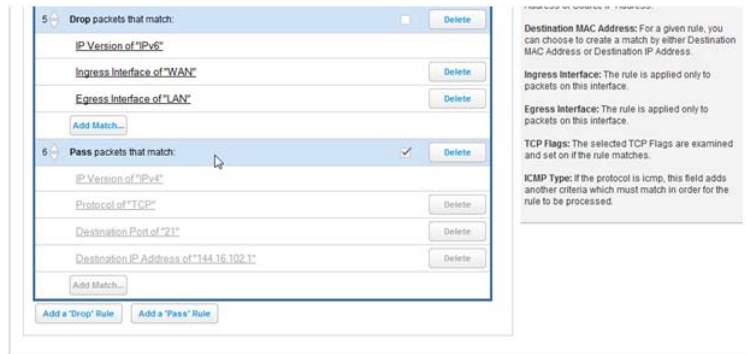
6. Select the **Add Match** button below the new rule created above. This opens the **Match Entry** view.



7. For this example, the filter will be made based on a TCP port. Select **Protocol** from the **Match Type** drop-down menu. This automatically fills in **TCP** in the **Match Value** field. At this point do not enable the rule until all criteria have been entered.
8. Click **Enter Match**. This will return the GUI to the **Packet Rules** list.
9. Select **Add Match** below the rule created earlier.
10. Select **Destination Port** from the **Match Type** drop-down menu and enter **21** (this value corresponds to FTP) in the **Match Value** entry box.
11. Click **Enter Match**.
12. Select **Add Match** below the same rule created earlier.

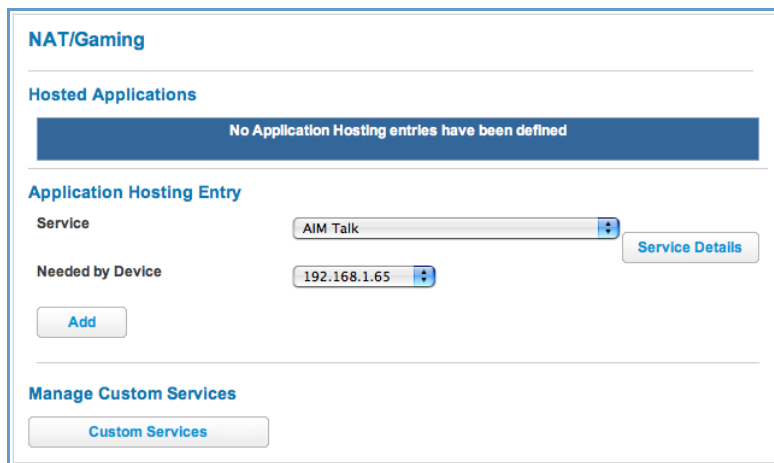


13. Select **Destination IP Address** from the **Match Type** drop-down menu and enter the IP address entered in Step 3 of this procedure.
14. Select the **Enable Rule** check box and click **Enter Match**. The GUI returns to the **Packet Rules** list and the rule is active and grayed out. It cannot be edited without first disabling the rule.



[Link: NAT/Gaming](#)

When you click the [NAT/Gaming](#) link, the NAT/Gaming page appears.



The NAT/Gaming feature allows you to host internet applications when NAT (network address translation) is enabled. You can host different games and software on different PCs.

From the **Service** drop-down menu, you can select any of a large number of predefined games and software. (See [“List of Supported Games and Software” on page 71.](#)) In addition to choosing from these predefined services you can also select a user defined custom service. (See [“Custom Services” on page 69.](#))

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/UDP
Global Port Range	3000-3000
Protocol	TCP/UDP
Global Port Range	5190-5190

[Return to NAT/Gaming](#)

1. Select a hosting device from the **Needed by Device** drop-down menu.
2. Once you choose a software service or game, click [Add](#).
3. Select a PC to host the software from the Select Host Device drop-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	Details
Needed by Device	precision-m65	

[Add](#) [Save](#)

Custom Services

[Add/Edit 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.

Changes saved

NAT/Gaming

Hosted Applications

Service	Ports	Device	Delete
AIM Talk	TCP/UDP: 3000,5190	E51311-04	Delete

Application Hosting Entry

Service: [Service Details](#)

Needed by Device:

[Add](#)

Manage Custom Services

[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:

[Add](#)

[Return to NAT/Gaming](#)

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 NVG599 device 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 add 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

[Add](#)

[Return to NAT/Gaming](#)

Changes are saved immediately.

To remove this Service, click the [Delete](#) button.

To edit this Service, click the [Edit](#) button.



NOTE:

You cannot edit a custom service if that service is active; it must be inactive before it can be edited.

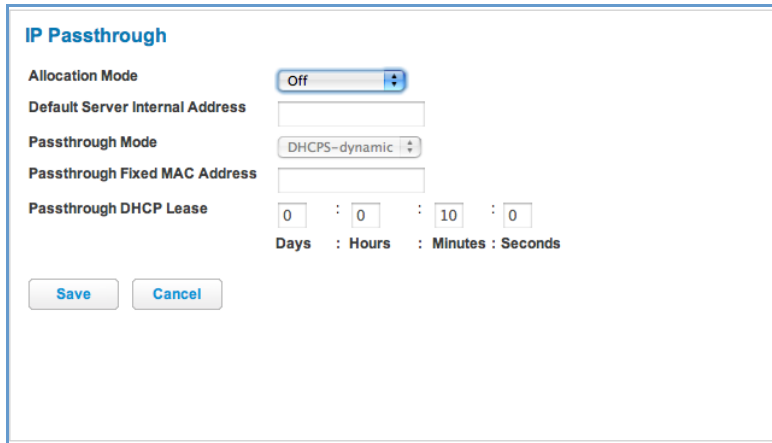
List of Supported Games and Software

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](#)

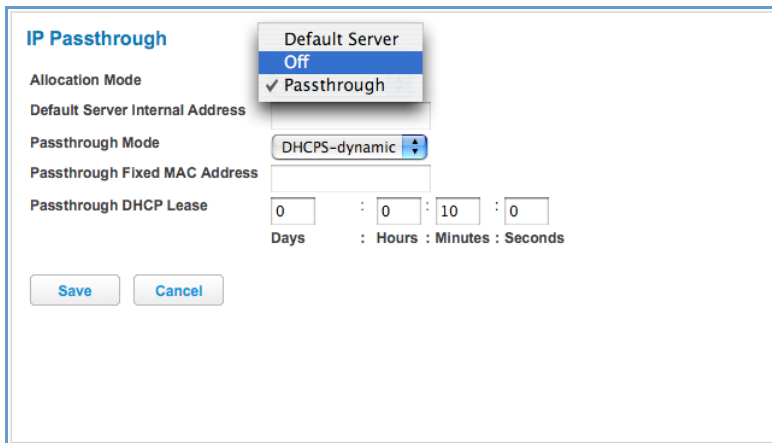
When you click the [IP Passthrough](#) link, the IP Passthrough page appears.



The screenshot shows the 'IP Passthrough' configuration page. The 'Allocation Mode' dropdown menu is set to 'Off'. Other fields include 'Default Server Internal Address', 'Passthrough Mode' (set to 'DHCPs-dynamic'), 'Passthrough Fixed MAC Address', and 'Passthrough DHCP Lease' (set to 0 days, 0 hours, 10 minutes, and 0 seconds). There are 'Save' and 'Cancel' buttons at the bottom.

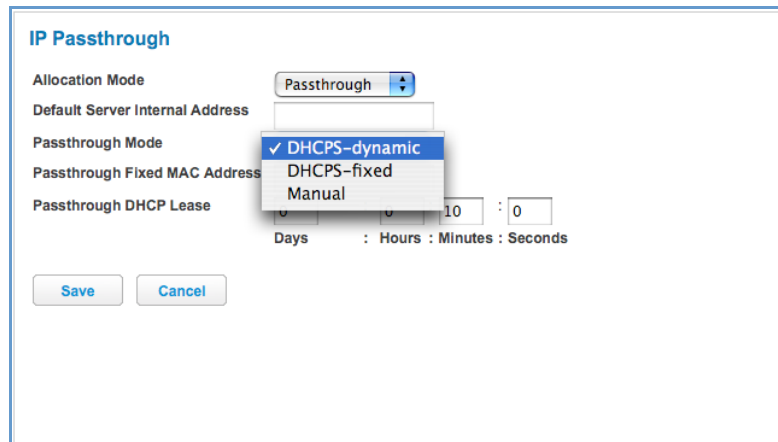
IP Passthrough

The IP Passthrough feature allows a single PC on the LAN to have the ARRIS Gateway's public address assigned to it. It also provides PAT (port address translation) (or NAT – network address and port translation) via the same public IP address for all other hosts on the private LAN subnet.



The screenshot shows the 'IP Passthrough' configuration page with the 'Allocation Mode' dropdown menu open. The menu options are 'Default Server', 'Off', and 'Passthrough', with 'Passthrough' selected and marked with a checkmark. The other fields and buttons are the same as in the previous screenshot.

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.

- ◆ The two DHCP modes assign the needed WAN IP information to the client automatically.
 - You can select the MAC address of the PC you want to be the IP Passthrough client with **fixed** mode, or,
 - with “first-come-first-served” – **dynamic** – the first client to renew its address will be assigned the WAN IP.
- ◆ **Manual** mode is like statically configuring your PC. With Manual mode, you configure the **TCP/IP Properties** of the LAN client PC you want to be the IP Passthrough client. You then manually enter the WAN IP address, gateway address, and so on that matches the WAN IP address information of your ARRIS device. This mode works the same as the DHCP modes. Unsolicited WAN traffic will get passed to this client. The client is still able to access the ARRIS NVG599 device and other LAN clients on the 192.168.1.x network, etc.
- ◆ 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 upon restart.

A Restriction

Because both the NVG599 device and the passthrough host will use the same IP address, new sessions that conflict with existing sessions will be rejected by the NVG599. 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 – because, from the WAN, it is indistinguishable – will fail.

IP Passthrough

Allocation Mode:

Default Server Internal Address:

Passthrough Mode:

Passthrough Fixed MAC Address:

Passthrough DHCP Lease: : : :
Days : Hours : Minutes : Seconds

NAT Default Server

The NAT default server feature allows you to:

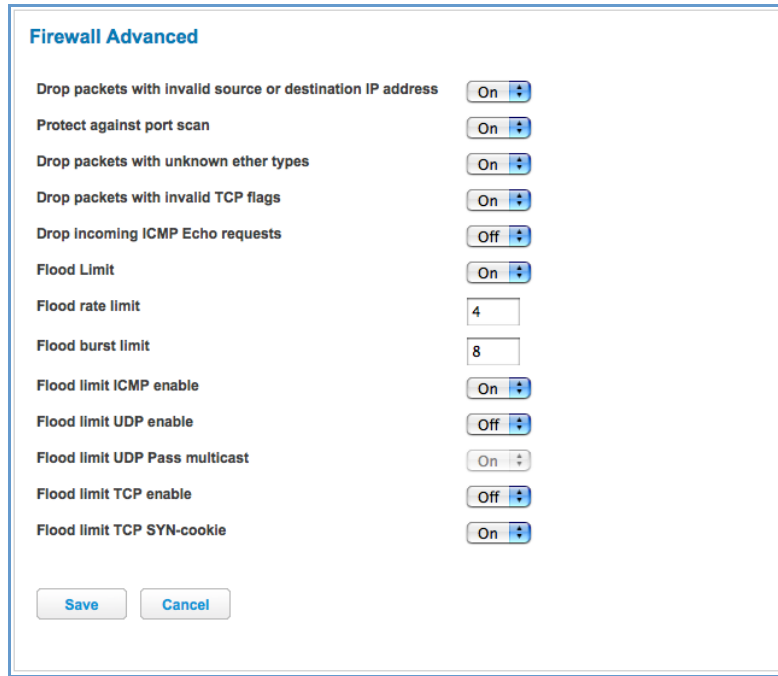
- ◆ Direct your NVG599 device to forward all externally initiated IP traffic (TCP and UDP protocols only) to a default host on the LAN, specified by your entry in the **Internal Address** field.
- ◆ Enable the default server for certain situations:
 - Where you cannot anticipate what port number or packet 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 device, these packets normally would be discarded. For instance, this feature could be used for application traffic where you do not 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](#) link the Firewall Advanced screen appears.



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 timeouts if stateful inspection is enabled on the interface. Stateful inspection parameters are active on a WAN interface only if enabled on your NVG599 device. Stateful inspection can be enabled on a WAN interface whether NAT is enabled or not.

DoS Protection – Denial-of-service (DoS) attacks are common on the Internet, and can render an individual PC or a whole network practically unusable by consuming all its resources. Your NVG599 includes default settings to block the most common types of DoS attacks. For special requirements or circumstances, a variety of additional blocking characteristics are 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
Drop incoming ICMP Echo requests	Whether all ICMP echo requests are to be dropped; On or Off.

Menu item	Function
Flood Limit	Whether packet flooding should be detected and offending packets be dropped; On or Off .
Flood rate limit	Specifies the number limit of packets per second before dropping the remainder.
Flood burst limit	Specifies the number limit of packets in a single burst before dropping the remainder.
Flood limit ICMP enable	Whether ICMP traffic packet flooding should be detected and offending packets be dropped; On or Off .
Flood limit UDP enable	Whether UDP traffic packet flooding should be detected and offending packets be dropped; On or Off .
Flood limit UDP Pass multicast	Allows exclusion of UDP multicast traffic. On by default.
Flood limit TCP enable	Allows exclusion of TCP traffic. Off by default.
Flood limit TCP SYN-cookie	Allows TCP SYN cookies flooding to be excluded.
Neighbor Discovery Attack protection	Prevents downstream traffic from an upstream device that sends excessive traffic but receives no replies; On or Off .
ESP Header Forwarding	Allows the use of Encapsulating Security Payload (ESP) data payload encryption for IP Secure (IPsec) from qualifying endpoints; On or Off .
Authentication Header Forwarding	Accept and forward IPSec packets with Authentication Headers, which may be used by some IPSec implementations to validate packet sources ; On or Off .
Reflexive ACL	When IPv6 is enabled, Reflexive Access Control Lists can deny inbound IPv6 traffic unless this traffic results from returning outgoing packets (except as configured through firewall rules).

If you make any changes here, click the [Save](#) button.

Diagnostics

When you click the [Diagnostics](#) tab, the Troubleshoot page appears.

The screenshot shows a web interface titled "Troubleshoot". At the top, it says "Running this test will help locate problems with your Internet Connection." Below this is a table with four rows: "Ethernet", "Authentication", "IP", and "DNS". Each row has a status indicator (a dash) and a "Details" button. Below the table is a "Run Full Diagnostics" button. Underneath is a section titled "Test Internet Access" with instructions to enter an internet address. There is an "Address" input field and buttons for "Ping", "Traceroute", "NSLookup", and "Detect Missing Filter". A red warning icon and text state "Detect Missing Filter is an invasive test." At the bottom is a "Progress Window" which is currently empty.

Ethernet	-	Details
Authentication	-	Details
IP	-	Details
DNS	-	Details


Run Full Diagnostics

Test Internet Access

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

Address

Ping Traceroute NSLookup

Detect Missing Filter  Detect Missing Filter is an invasive test.

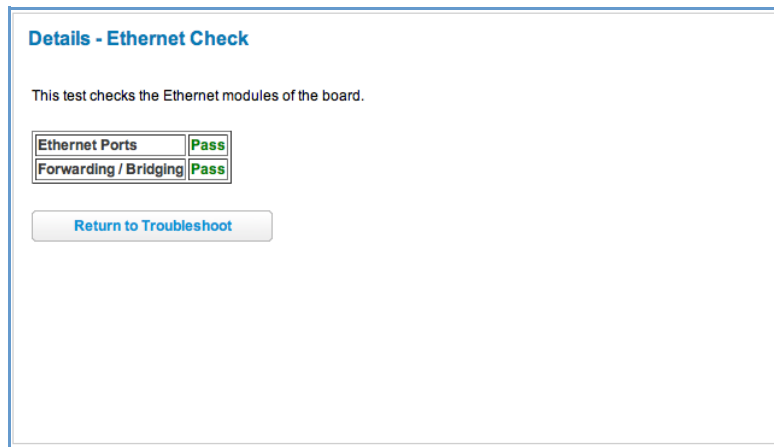
Progress Window

This automated multi-layer test examines the functions 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 device 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. The details presented depend on the configuration of your router and your network type.

Here is an example of the Ethernet Details screen.



Test Internet Access

Internet access 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.arris.com). You enter a Web address URL or an IP address in the respective field.

Click the [Ping](#), [Trace](#), [NSLookup](#), or [Detect Missing Filter](#) 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.
- ◆ **Detect Missing Filter** - if you click the [Detect Missing Filter](#) button, a warning message appears at the top since the detection takes up to 2 minutes. When completed the Progress area might look like following.

```
Non-linear Noise Level: Low
Affected Bins: 6
Non-Linearity Threshold: 60
Non-linear Echo(db): 0
```

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. Be sure to 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 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.

Logs

[Clear Log](#) [Save to File...](#) Select Log: **System** (checked), Firewall, VoIP

```
P0000-00-00T00:00:04 L6 sdb[318]: log buffer s... 192
P0000-00-00T00:00:04 L7 sdb[318]: libmotopia: .../motopia
P0000-00-00T00:00:04 L7 sdb[318]: starting process /sbin/klogd (pid 323)
P0000-00-00T00:00:11 L7 sdb[318]: libmotopia: Closing /dev/motopia
P0000-00-00T00:00:11 L7 sdb[318]: Loading platform module bcm_enet
P0000-00-00T00:00:12 L6 sdb[318]: SSL CA-root-cert directory is ready.
P0000-00-00T00:00:12 L6 sdb[318]: Hardware is 'NVG510'
P0000-00-00T00:00:13 L6 sdb[318]: S/N 153056273312, SKU 64
P0000-00-00T00:00:15 L3 sdb[318]: Wireless subsystem found
P0000-00-00T00:00:18 L5 sdb[318]: VOIP subsystem found
P0000-00-00T00:00:18 L7 sdb[318]: netfilter: redirect object not found. skip prerout
P0000-00-00T00:00:20 L6 sdb[318]: ip6.route[1]: setting state from 'unset' to 'down
P0000-00-00T00:00:20 L3 sdb[318]: Wi-Fi: Adding interface w10
P0000-00-00T00:00:20 L3 sdb[318]: Wi-Fi: Adding interface w10.1
P0000-00-00T00:00:20 L3 sdb[318]: Wi-Fi: Adding interface w10.2
P0000-00-00T00:00:20 L3 sdb[318]: Wi-Fi: Adding interface w10.3
P0000-00-00T00:00:20 L3 sdb[318]: DSL: EOC version 23a2dd63a0 NVG510 901108-64
P0000-00-00T00:00:20 L7 sdb[318]: enabling vc[1]
P0000-00-00T00:00:21 L7 sdb[318]: starting process /bin/voipexe (pid 1089)
P0000-00-00T00:00:21 L5 sdb[318]: voipexe start returned ret=0
P0000-00-00T00:00:21 L5 sdb[318]: login authorization-delay timer set for 300 second
P0000-00-00T00:00:21 L5 sdb[318]: SYS: no saved configuration found, using defaults
P0000-00-00T00:00:21 L6 sdb[318]: ip6_set_proc: setting to '1'
P0000-00-00T00:00:21 L6 sdb[318]: ip6_set_proc: setting to '1'
P0000-00-00T00:00:21 L6 sdb[318]: ip6_set_proc: setting to '0'
P0000-00-00T00:00:22 L7 sdb[318]: sdb_system (ret 2): tc qdisc delete dev eth0 ingre
P0000-00-00T00:00:22 L7 sdb[318]: sdb_system (ret 2): tc qdisc delete dev eth1 ingre
P0000-00-00T00:00:22 L7 sdb[318]: sdb_system (ret 2): tc qdisc delete dev eth2 ingre
P0000-00-00T00:00:23 L7 sdb[318]: sdb_system (ret 2): tc qdisc delete dev eth3 ingre
P0000-00-00T00:00:23 L7 sdb[318]: Ensw QoS: p-bit map: 0 0 0 1 1 2 2
P0000-00-00T00:00:23 L7 sdb[318]: Ensw: QoS configured
P0000-00-00T00:00:23 L7 sdb[318]: Ensw: max age is 300
P0000-00-00T00:00:23 L3 sdb[318]: Wi-Fi: Initializing the subsystem
P0000-00-00T00:00:23 L3 sdb[318]: Wi-Fi: Starting autochannel scan...
P0000-00-00T00:00:25 L3 sdb[318]: Wi-Fi: Autochannel found channel 11 on attempt 1
P0000-00-00T00:00:25 L7 sdb[318]: starting process /sbin/eapd (pid 1170)
P0000-00-00T00:00:25 L3 sdb[318]: Wi-Fi: EAPD daemon started
P0000-00-00T00:00:25 L7 sdb[318]: starting process /sbin/nas (pid 1171)
P0000-00-00T00:00:25 L3 sdb[318]: Wi-Fi: NAS daemon started
P0000-00-00T00:00:25 L7 sdb[318]: Port ssid-1 sending UP event
P0000-00-00T00:00:25 L6 sdb[318]: DSL: TPS-TC encoding set to auto-detect.
P0000-00-00T00:00:26 L3 sdb[318]: DSL: NLNM threshold value set to 60
P0000-00-00T00:00:26 L3 sdb[318]: DSL: Bitswap is ON, SRA is ON
P0000-00-00T00:00:26 L3 sdb[318]: DSL: Dying Gasp is OFF
P0000-00-00T00:00:26 L3 sdb[318]: DSL: DSP version - A2pd0351.d24b
P0000-00-00T00:00:26 L7 sdb[318]: sdb_system (ret 2): tc qdisc delete dev ptm0 ingre
P0000-00-00T00:00:26 L5 sdb[318]: ATM: Autodetect: Setting VC 1 vpi 0 vci35
P0000-00-00T00:00:26 L3 sdb[318]: ATM: VC 1, vpi=0, vci=35 QoS No
P0000-00-00T00:00:26 L7 sdb[318]: ATM: VC QoS No change: vpi=0 vci =35
P0000-00-00T00:00:26 L3 sdb[318]: ATM: VC vpi=0 vci =35 vc-1 atml
P0000-00-00T00:00:26 L7 sdb[318]: sdb_system (ret 2): tc qdisc delete dev atml ingre
P0000-00-00T00:00:26 L5 sdb[318]: ATM: VC 2 vpi 0 vci 0 disabled
P0000-00-00T00:00:26 L5 sdb[318]: ATM: VC 3 vpi 0 vci 0 disabled
P0000-00-00T00:00:26 L5 sdb[318]: ATM: VC 4 vpi 0 vci 0 disabled
P0000-00-00T00:00:26 L5 sdb[318]: ATM: VC 5 vpi 0 vci 0 disabled
P0000-00-00T00:00:26 L5 sdb[318]: ATM: VC 6 vpi 0 vci 0 disabled
P0000-00-00T00:00:26 L5 sdb[318]: ATM: VC 7 vpi 0 vci 0 disabled
P0000-00-00T00:00:26 L5 sdb[318]: ATM: VC 8 vpi 0 vci 0 disabled
P0000-00-00T00:00:28 L7 sdb[318]: conn[1]: linkchange_handler got event 19 from linl
P0000-00-00T00:00:28 L7 sdb[318]: conn[2]: linkchange_handler got event 19 from linl
P0000-00-00T00:00:28 L7 sdb[318]: conn[11]: linkchange_handler got event 19 from linl
```

The current status of the device is displayed for all logs: **System**, **Firewall**, or **VoIP**. Choose the log you want to display from the drop-down menu.

- ◆ 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 ARRIS device'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.

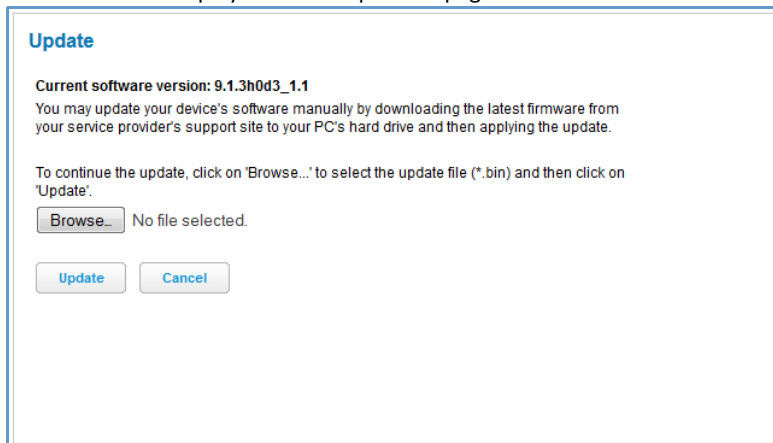
The following is an example log portion saved as a .TXT file:

No.	Time	Src IP	Dst IP	Proto	Reason
1	2012-03-06T12:04:56-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
2	P0000-00-00T00:01:34	192.168.1.105	192.168.1.254	TCP	Downstream direction
3	P0000-00-00T00:05:52	192.168.1.105	192.168.1.254	TCP	Downstream direction
4	P0000-00-00T00:08:16	192.168.1.105	192.168.1.254	TCP	Downstream direction
5	2012-03-06T12:22:00-05:00	192.168.1.43	192.168.1.254	TCP	Downstream direction
6	2012-03-06T12:22:20-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
7	2012-03-06T12:24:07-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
8	2012-03-06T12:25:08-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
9	2012-03-06T12:26:09-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
10	2012-03-06T12:28:53-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
11	P0000-00-00T00:00:39	192.168.1.253	255.255.255.255	UDP	Generic Discards
12	2012-03-06T12:33:13-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
13	2012-03-06T12:34:17-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
14	2012-03-06T12:35:20-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
15	2012-03-06T12:36:24-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
16	2012-03-06T12:37:28-05:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
17	2012-03-06T11:48:18-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
18	2012-03-06T11:49:22-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
19	2012-03-06T11:51:17-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
20	2012-03-06T11:52:21-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
21	2012-03-06T11:56:18-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
22	2012-03-06T11:57:22-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
23	2012-03-06T11:58:26-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
24	2012-03-06T11:59:30-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
25	2012-03-06T12:00:39-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
26	2012-03-06T12:05:11-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
27	2012-03-06T12:06:15-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
28	2012-03-06T12:07:19-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
29	2012-03-06T12:08:23-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
30	2012-03-06T12:09:26-06:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
31	2012-03-06T10:38:03-08:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
32	2012-03-06T10:39:06-08:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
33	2012-03-06T10:40:10-08:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
34	2012-03-06T10:41:13-08:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
35	2012-03-06T10:42:17-08:00	10.8.50.176	10.8.205.145	ICMP	ICMP Echo Request
36	2012-03-08T18:28:23Z	10.43.0.156	224.0.0.1	2	Generic Discards
The last message was repeated 14 times.					
38	2012-03-09T12:48:24Z	10.43.0.156	224.0.0.1	2	Generic Discards
The last message was repeated 13 times.					
40	2012-03-09T13:24:55Z	10.17.219.52	50.30.8.46	TCP	Downstream direction
41	2012-03-09T13:25:54Z	10.43.0.156	224.0.0.1	2	Generic Discards
42	2012-03-09T13:30:04Z	10.43.0.156	224.0.0.1	2	Generic Discards
43	2012-03-09T13:32:09Z	10.43.0.156	224.0.0.1	2	Generic Discards
44	2012-03-09T13:32:18Z	192.168.1.65	74.125.225.133	TCP	Downstream direction
45	2012-03-09T13:34:14Z	10.43.0.156	224.0.0.1	2	Generic Discards
46	2012-03-09T13:36:19Z	10.43.0.156	224.0.0.1	2	Generic Discards
47	2012-03-09T13:38:24Z	10.43.0.156	224.0.0.1	2	Generic Discards
48	2012-03-09T13:42:34Z	10.43.0.156	224.0.0.1	2	Generic Discards
49	2012-03-09T13:59:14Z	10.43.0.156	224.0.0.1	2	Generic Discards
50	2012-03-09T10:09:58-05:00	192.168.1.65	69.171.228.21	TCP	Downstream direction
51	P0000-00-00T00:00:39	192.168.1.43	192.168.1.255	UDP	Generic Discards

Link: Update

When you click [Update](#), the Update page appears.

Operating system software is what makes your NVG599 device run, and occasionally it needs to be updated. Your **Current software version** is displayed at the top of the page.



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.

1. [Browse](#) your computer for the operating system file you downloaded and select the file.
2. Click the [Update](#) button.
The LEDs will operate normally as described in ["Status Indicator Lights" on page 88](#).
3. The installation may take a few minutes and the Web page will indicate a 3-part countdown before returning you to the Home page; wait for it to complete. During the software installation, you will lose Internet and phone service. The LEDs will function as follows:
 - The **Power** LED will flash **Orange/Amber** during firmware upgrade (flash writing to memory) and all other LEDs will be off.
4. The Gateway will restart automatically.
As the device reboots, the LEDs display power-on behavior.
5. Your new operating system will then be running.

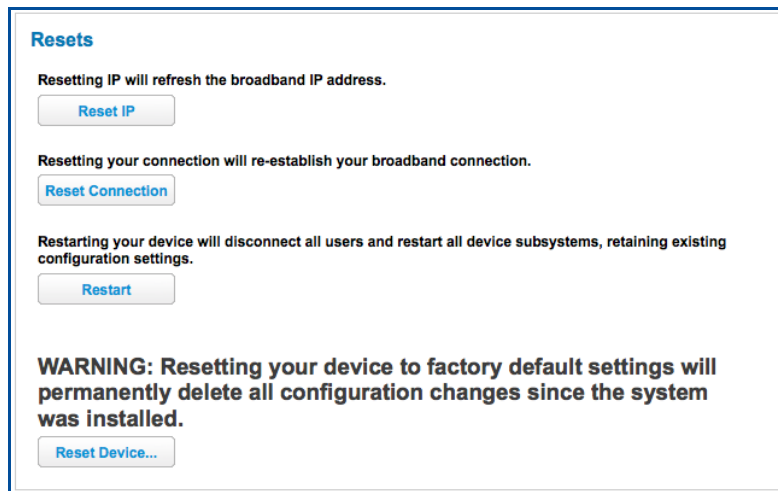
[Link: Resets](#)

When you click the [Resets](#) link, the Resets page appears.

In some cases, you may need to clear all the configuration settings and start over again to program the ARRIS NVG599 device. 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 IP](#) button to refresh your Internet WAN IP address. LAN-side users will be briefly disconnected from the Internet, but will otherwise be unaffected.
- ◆ Click the [Reset Connection](#) button to disconnect and reconnect all of your connections, including your VoIP phones.
- ◆ Click the [Reset Device](#) button to reset the Gateway back to its original factory default settings.
- ◆ Click the [Restart](#) button to reboot the device. Previous configuration settings are still retained.



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 NVG599 device.

Link: Syslog

When you click the [Syslog](#) link the Syslog configuration page appears. You can configure a UNIX-compatible (BSD Syslog protocol - RFC 3164) Syslog client to report a number of subsets of the events entered in the device logs.

The screenshot shows the Syslog configuration page in the AT&T/ARRIS network management interface. The page has a blue header with the AT&T logo on the left and the ARRIS logo on the right. Below the header is a navigation bar with tabs for Device, Broadband, Home Network, Voice, Firewall, and Diagnostics. Under the Diagnostics tab, there are sub-tabs for Troubleshoot, Logs, Update, Resets, Syslog, Event Notifications, and NAT Table. The Syslog configuration form includes the following fields:

- Syslog:** A dropdown menu set to "On".
- Server IP Address:** An empty text input field.
- Server Port:** A text input field containing "514".
- Facility:** A dropdown menu set to "Local0".
- Log Level:** A dropdown menu set to "Notice".
- System Log:** A dropdown menu set to "On".
- Firewall Log:** A dropdown menu set to "Off".
- Voice Log:** A dropdown menu set to "Off".

At the bottom of the form are "Save" and "Cancel" buttons. To the right of the form is a "Help" section with the following text:

Help
The syslog function, if enabled, sends log messages to the specified Server IP Address using the specified Server Port. You must have a UNIX-compatible syslog client for this feature.

Facility: Syslog allows programs to supply an identifying Facility string that syslog will prepend to each log message. This allows easy selection of the log messages in interest.

Log Level: This level is the severity level of logs sent to the syslog client. The severity level of the system may be more inclusive than that of the syslog. The levels in decreasing order of severity are:

1. Emergency
2. Alert
3. Critical
4. Error
5. Warning
6. Notice
7. Info
8. Debug

Log Types: You can turn on/off various categories of syslog entries.

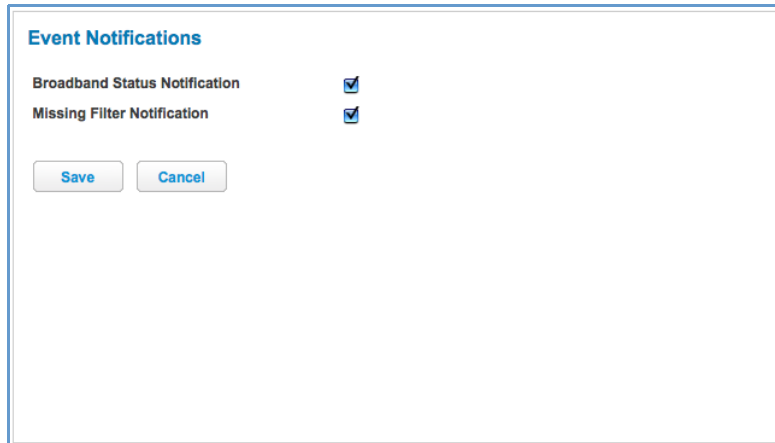
- ◆ You can enable or disable the Syslog client dynamically. When enabled, it will report any appropriate and previously unreported events.
- ◆ You can specify the Syslog server's address and port, if required, either in dotted decimal format or as a DNS name of up to 63 characters.
- ◆ You can specify the UNIX Syslog facility to use by selecting from the **Facility** drop-down menu.
- ◆ From the **Log Level** drop-down menu, you can select a level from a list organized in decreasing severity level: Emergency, Alert, Critical, Error, Warning, Notice, Info, or Debug.
- ◆ By toggling each event descriptor to either **On** or **Off**, you can determine which ones are logged and which are ignored.

You will need to install a Syslog client daemon program on your PC and configure it to report the events you specified in the Syslog configuration screen.

Click the [Save](#) button.

[Link: Event Notifications](#)

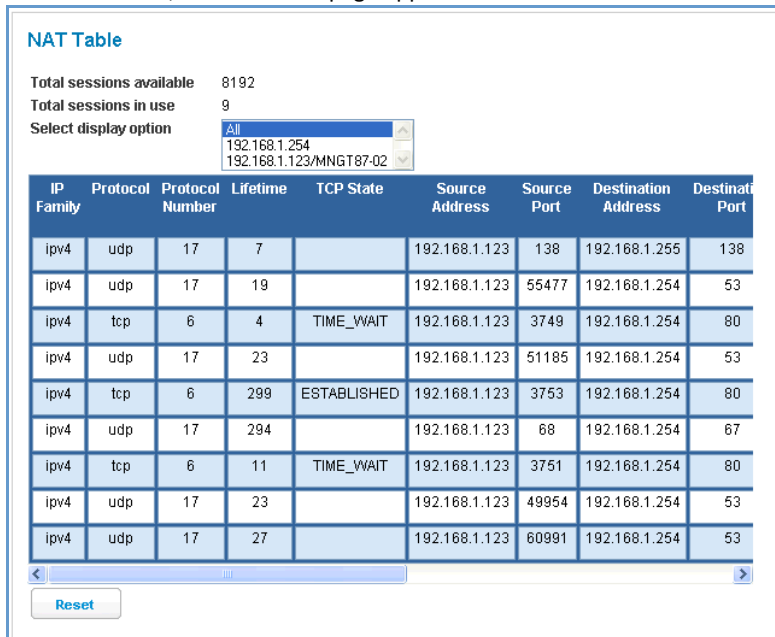
When you click the [Event Notifications](#) link, the Event Notifications page appears.



- ◆ If you select the **Broadband Status Notification** checkbox, the device will alert users on your network if the connection to the Internet should fail. In that event, troubleshooting suggestions will display.
- ◆ If you select the **Missing Filter Notification** checkbox, the device will alert users on your network if hardware line filters are either missing or improperly installed. In that event, troubleshooting suggestions will display.

[Link: NAT Table](#)

When you click the [NAT Table](#) link, the NAT Table page appears.



The NAT Table page displays the network address translation sessions in use by the NVG599 device. You can use the drop-down menu to limit the displayed sessions to selected IP addresses.

To refresh all the sessions displayed, click the [Reset](#) button.

CHAPTER 3 Basic Troubleshooting

This chapter gives some simple suggestions for troubleshooting problems with your NVG599 VDSL2 Gateway's initial configuration. This chapter covers the following topics:

- ◆ Status Indicator Lights on [page 88](#)
- ◆ Factory Reset Switch on [page 95](#)
- ◆ Event Log Messages on [page 96](#)

Before troubleshooting, make sure you have:

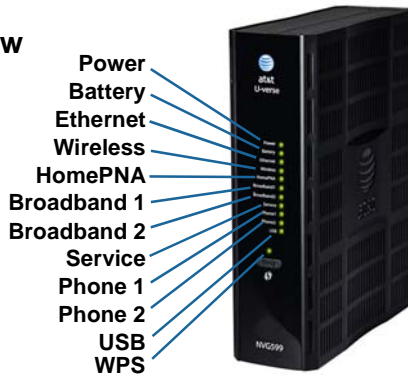
- ◆ Read this guide
- ◆ Plugged in all the necessary cables
- ◆ Set your PC's TCP/IP controls to obtain an IP address automatically

Status Indicator Lights

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


ARRIS NVG599 VDSL2 Gateway Status Indicator Lights

Side View

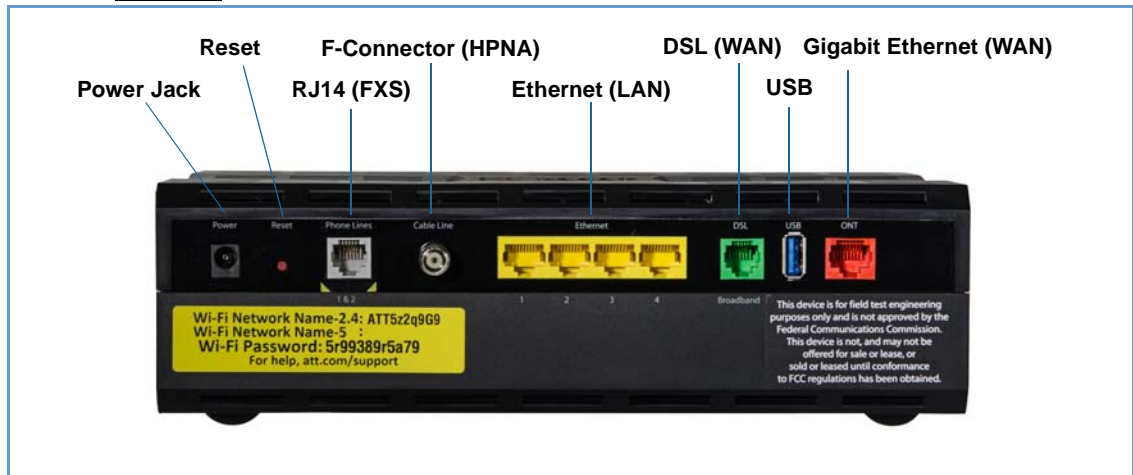


LED	Activity
Power	<p>Solid Green = The device is powered.</p> <p>Flashing Green = A power-on self-test (POST) is in progress</p> <p>Flashing Red = A POST failure (not bootable) or device malfunction occurred.</p> <p>Flashing Amber = Firmware upgrade in progress (see below)</p> <p>Off = The unit has no AC power. If the battery is in use, the Battery LED will indicate battery status, and all other LEDs will be off.</p>
Power during Firmware Upgrade	<p>During the software installation, you will lose Internet and phone service. The LEDs will function as follows:</p> <ol style="list-style-type: none"> As firmware is being loaded into flash, the LEDs operate normally. During the firmware upgrade, which takes a few minutes, the Power LED will flash amber (flash writing to memory), and all other LEDs are off. The NVG599 restarts automatically. As the device reboots, the LEDs display power-on behavior.
All during Boot process	<ul style="list-style-type: none"> Power LED = Flashing Green All other LEDs = Off <p>If the device does not boot and fails its self-test or fails to perform initial load of the bootloader:</p> <ul style="list-style-type: none"> Power LED = Flashing Red ALL other LEDs = Off <p>If the device boots and then detects a failure:</p> <p>Power LED = Flashing Green starting POST, and then all LEDs will flash red, including Power LED.</p>
Battery	<p>Solid Green = Battery in place but not being used.</p> <p>Flashing Green = Battery charging.</p> <p>Solid Red = Battery backup mechanism has a fault.</p> <p>Flashing Red = Battery needs to be replaced.</p> <p>Solid Amber = Battery in use.</p> <p>Flashing Amber = Low battery.</p> <p>Off = No battery, or battery has no charge.</p>

LED	Activity
Ethernet	<p>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).</p> <p>Flickering Green = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic.</p> <p>Off = The device is not powered, or no cable or no powered devices are connected to the associated ports.</p>
WiFi	<p>Solid Green = Wi-Fi is powered.</p> <p>Flickering Green = Activity seen from devices connected via Wi-Fi. The flickering of the light is synchronized to actual data traffic.</p> <p>Off = The device is not powered, or no powered devices are connected to the associated ports.</p>
HomePNA	<p>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).</p> <p>Flickering Green = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic.</p> <p>Off = The device is not powered, or no cable or no powered devices are connected to the associated ports.</p>
Broadband 1**, 2	<p>Solid Green = Good broadband connection (good DSL sync or Gigabit Ethernet).</p> <p>Flashing Green = Attempting broadband connection (DSL attempting sync).</p> <p>Flashing Green and Red = If, after three consecutive minutes, the broadband connection fails to be established, the LED switches to Flashing Green alternating with a five second steady Red while attempting or waiting to establish a broadband connection. This pattern continues until the broadband connection is successfully established.</p> <p>Flashing Red = No DSL signal on the line. This display is not used during times of temporary 'no tone' during the training sequence.</p> <p>Off = The device is not powered.</p> <p>** Broadband 1 LED is also the Gigabit Ethernet WAN LED when that is in play (and DSL is not).</p>
Service	<p>Solid Green = IP connected. The device has a WAN IP address from DHCP or 802.1x authentication and the broadband connection is up.</p> <p>Flashing Green = Attempting connection, attempting IEEE 802.1X authentication, or attempting to obtain DHCP information.</p> <p>Red = Device attempted to become IP connected and failed (no DHCP 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.</p> <p>Off = The device is not powered or the broadband connection is not present.</p>
Phone 1, 2	<p>Solid Green = The associated VoIP line has been registered with a SIP proxy server.</p> <p>Flashing Green = Indicates a telephone is off-hook on the associated VoIP line.</p> <p>Off = VoIP not in use, line not registered, or NVG599 power off.</p>
USB	<p>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).</p> <p>Flickering Green = Activity seen from devices associated with the port. The flickering of the light is synchronized to actual data traffic.</p> <p>Off = The device is not powered, no cable or no powered devices connected to the associated ports.</p>

LED	Activity
<p>WPS (appears after using WPS button)</p> 	<p>Solid Green = Wi-Fi Protected Setup has been completed successfully. LED should stay on for 5 minutes or until push button is pressed again.</p> <p>Flashing Green = Continues for 2 minutes, indicating when WPS is broadcasting.</p> <p>Flashing Red = Continues for 2 minutes, indicating a Session overlap was detected (possible security risk).</p> <p>Solid Red = Error unrelated to security, such as failure to find a partner, or WPS is disabled. LED should stay solid red for 5 minutes or until push button is pressed again.</p> <p>Off = The device is not powered, or no cable or no powered devices are connected to the associated ports.</p>

Rear View



LED	Action
<p>Ethernet 1,2 3,4</p>	<p>Flashing Amber = A Gigabit Ethernet device is connected to each port.</p> <p>Solid Green = A 10/100 Ethernet device is connected.</p> <p>Flickering Green = Ethernet traffic activity.</p> <p>Off = The device is not powered, or no powered devices are connected to the associated ports.</p>



NOTE:

The NVG599 supports two VoIP lines over one RJ11 VoIP port. In order to connect two phone lines the supplied inner/outer pair splitter adapters must be attached to the RJ11 VoIP port in order to terminate both lines. This is a special-purpose splitter. You must only use the inner/outer pair splitter adapters supplied by AT&T.



LED Function Summary Matrix

Power	Solid Green = The device is powered.	Flashing Green = A power-on self-test (POST) is in progress.	Orange/Amber = Firmware upgrade (see “Power during Firmware Upgrade” on page 88)	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.
Battery	Solid Green = Battery in place but not being used.	Flashing Green = Battery charging.	Solid Amber = Battery in use. Flashing Amber = Low battery.	Solid Red = Battery backup mechanism has a fault. Flashing Red = Battery needs to be replaced.	Off = No battery or battery has no charge. Cycle between all colors = Battery conducting self-test.
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.
WiFi	Solid Green = Wi-Fi is powered.	Flashing Green = Activity seen from devices connected via Wi-Fi. 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.
HomePNA	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.

<p>Broadband 1**, 2</p>	<p>Solid Green = Good broadband connection (i.e., good DSL Sync). ** Broadband 1 LED is also the Gigabit ethernet WAN LED when that is in play (and DSL is not).</p>	<p>Flashing Green = Attempting broadband connection (i.e., DSL attempting sync).</p>	<p>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.</p>	<p>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.</p>	<p>Off = The device is not powered.</p>
<p>Service</p>	<p>Solid Green = IP connected (The device has a WAN IP address from DHCP or 802.1x authentication and the broadband connection is up).</p>	<p>Flashing Green = Attempting PPP connection.p Attempting IEEE 802.1X authentication or attempting to obtain DHCP information.</p>		<p>Red = Device attempted to become IP connected and failed (no DHCP 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.</p>	<p>Off = The device is not powered or the broadband connection is not present.</p>
<p>Phone 1, 2</p>	<p>Solid Green = The associated VoIP line has been registered with a SIP proxy server.</p>	<p>Flashing Green = Indicates a telephone is off-hook on the associated VoIP line.</p>			<p>Off = VoIP not in use, line not registered or NVG599 power off.</p>

USB	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.
WPS	Solid Green = Wi-Fi Protected Setup has been completed successfully. It should stay on for 5 minutes or until push button is pressed again.	Flashing Green = Indicates when WPS is broadcasting.	Solid Red = Error unrelated to security, such as failed to find any partner, or protocol prematurely aborted. It should stay Solid Red for 5 min or until push button is pressed again.	Flashing Red = Session overlap detected (possible security risk) in Scenario.	Off = WPS is not active, the device is not powered, no cable or no powered devices connected to the associated ports.

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

LED Not Lit	Possible Problems
Power	<ul style="list-style-type: none">◆ 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	<ul style="list-style-type: none">◆ 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 is 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	<ul style="list-style-type: none">◆ 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 are 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 use the factory reset switch to reset the NVG599 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 NVG599 is to follow these steps:

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



Reset Switch

2. Carefully insert the point of a pen or an unwound paperclip into the opening.
 - ◆ If you press the factory reset switch for **less than ten seconds**, the device will be rebooted. The indicator lights on the device will respond immediately and start blinking red within one second of the reset switch being pressed. The lights will blink whether the switch is still being pressed or has been released. The indicator lights will flash for a minimum of five seconds, even if the reset switch is released within five seconds of being pressed. If the reset switch is held for more than five seconds, it will continue to blink until released or until ten seconds have elapsed (see below).
 - ◆ If you press the factory reset switch for a **longer period of time**, the device will be reset to the factory default shipped settings. If the switch is held for ten seconds, the Power indicator continues to blink for an additional five seconds, and then the indicator lights return to their normal operating mode, whether or not the reset switch is still depressed.

Log Event Messages

The system generates the log messages described in the following tables for events related to administrative access, system operation, DSL issues, packet access, or firewall issues.

Administration-Related Log Messages

- | | |
|---|--|
| 1. administrative access attempted: | This log message is generated whenever the user attempts to access the router's management interface. |
| 2. administrative access authenticated and allowed: | This log message is generated whenever the user attempts to access the router's management interface and is successfully authenticated and allowed access to the management interface. |
| 3. administrative access allowed: | If for some reason, a customer does not want password protection for the management interface, this log message is generated whenever any user attempts to access the router's management interface and is allowed access to the management interface. |
| 4. administrative access denied - invalid user name: | This log message is generated whenever the user tries to access the router's management interface and authentication fails because of an incorrect username. |
| 5. administrative access denied - invalid password: | This log message is generated whenever the user tries to access the router's management interface and authentication fails because of an incorrect password. |
| 6. administrative access denied - telnet access not allowed: | This log message is generated whenever the user tries to access the router's Telnet management interface from a public interface and is not permitted because remote management is disabled. |
| 7. administrative access denied - web access not allowed: | This log message is generated whenever the user tries to access the router's HTTP management interface from a public interface and is not permitted because remote management is disabled. |

System Log Messages

- | | |
|--|--|
| 1. Received NTP Date and Time: | This log message is generated whenever NTP receives date and time from the server. |
| 2. EN: IP up: | This log message is generated whenever Ethernet WAN comes up. |
| 3. WAN: Ethernet WAN1 activated at 100000 Kbps: | This log message is generated when the Ethernet WAN link is up. |
| 4. Device Restarted: | This log message is generated when the router has been restarted. |

DSL Log Messages (Most Common)

- | | |
|---|---|
| 1. WAN: Data link activated at <Rate> Kbps (rx/tx) | This log message is generated when the DSL link comes up. |
| 2. WAN: Data link deactivated | This log message is generated when the DSL link goes down. |
| 3. RFC1483 up | This log message is generated when RFC1483 link comes up. |
| 4. RFC1483-<WAN-instance>: IP down | This log message is generated when RFC1483 link goes down. |
| 5. PPP: Channel <ID> up Dialout Profile name: <Profile Name> | This log message is generated when a PPP channel comes up. |
| 6. PPP-<WAN Instance> down: <Reason> | This log message is generated when a PPP channel goes down. The reason for the channel going down is displayed as well. |

Access-Related Log Messages

- | | |
|---|--|
| 1. permitted: | This log message is generated whenever a packet is allowed to traverse router interfaces or allowed to access the router itself. |
| 2. attempt: | This log message is generated whenever a packet attempts to traverse router interfaces or attempts to access the router itself. |
| 3. dropped - violation of security policy: | This log message is generated whenever a packet, traversing the router or destined to the router itself, is dropped by the firewall because it violates the expected conditions. |
| 4. dropped - invalid checksum: | This log message is generated whenever a packet, traversing the router or destined to the router itself, is dropped because of invalid IP checksum. |
| 5. dropped - invalid data length: | This log message is generated whenever a packet, traversing the router or destined to the router itself, is dropped because the IP length is greater than the received packet length or if the length is too small for an IP packet. |
| 6. dropped - fragmented packet: | This log message is generated whenever a packet, traversing the router, is dropped because it is fragmented, stateful inspection is turned ON on the packet's transmit or receive interface, and the deny-fragment option is enabled. |
| 7. dropped - cannot fragment: | This log message is generated whenever a packet traversing the router is dropped because the packet cannot be sent without fragmentation, but the do-not-fragment bit is set. |
| 8. dropped - no route found: | This log message is generated whenever a packet, traversing the router or destined to the router itself, is dropped because no route is found to forward the packet. |
| 9. dropped - invalid IP version: | This log message is generated whenever a packet, traversing the router or destined to the router itself, is dropped because the IP version is not 4. |
| 10. dropped - possible land attack: | This log message is generated whenever a packet, traversing the router or destined to the router itself, is dropped because the packet is a TCP/UDP packet and the source IP address and source port equals the destination IP address and destination port. |
| 11. TCP SYN flood detected: | This log message is generated whenever a SYN packet destined to the router's management interface is dropped because the number of SYN-sent and SYN-receive messages exceeds one-half the number of allowable connections in the router. |

Access-Related Log Messages

- 12. Telnet receive DoS attack - packets dropped:** This log message is generated whenever TCP packets destined to the router's Telnet management interface are dropped due to overwhelming receive data.
- 13. dropped - reassembly timeout:** This log message is generated whenever packets, traversing the router or destined to the router itself, are dropped because of reassembly timeout.
- 14. dropped - illegal size:** This log message is generated whenever packets, traversing the router or destined to the router itself, are dropped during reassembly because of illegal packet size in a fragment.

Firewall Log Messages Detail (AT&T Requirement #841)

Reason Enumeration (C)	Log Text Representation	Why the Packet Was Logged
NM_LOGDROP_CAT_DIR	DIRECTION	Direction (generic)
NM_LOGDROP_CAT_DIR_UP	DIRECTION-UP	Upstream direction
NM_LOGDROP_CAT_DIR_DOWN	DIRECTION-DOWN	Downstream direction
NM_LOGDROP_CAT_ETH	ETH	Ethernet header (generic)
NM_LOGDROP_CAT_ETH_SRC_ADDR	ETH-SRC	Ethernet source MAC address
NM_LOGDROP_CAT_ETH_DST_ADDR	ETH-DST	Ethernet destination MAC address
NM_LOGDROP_CAT_ETH_PROT	ETH-PROTOCOL	Ethernet Protocol
NM_LOGDROP_CAT_ETH_VLAN	ETH-VLAN	Ethernet VLAN ID (where applicable)
NM_LOGDROP_CAT_IP	IP	IP header (generic)
NM_LOGDROP_CAT_IP_SRC	IP-SRC	IP source address
NM_LOGDROP_CAT_IP_DST	IP-DST	IP destination address
NM_LOGDROP_CAT_IP_PROT	IP-PROTOCOL	IP Protocol
NM_LOGDROP_CAT_IP_SPOOF	IP-SPOOF	IP address is spoofed (could not have been sent by a device legitimately with the address in the source address field)
NM_LOGDROP_CAT_IP_ILL	IP-ILLEGAL	IP address is illegal (either src or dest)
NM_LOGDROP_CAT_TCP	TCP	TCP header (generic)
NM_LOGDROP_CAT_TCP_SRC_PORT	TCP-SRC-PORT	TCP source port
NM_LOGDROP_CAT_TCP_DST_PORT	TCP-DST-PORT	TCP destination port
NM_LOGDROP_CAT_TCP_FLAGS	TCP-FLAGS	TCP flags field
NM_LOGDROP_CAT_UDP	UDP	UDP header (generic)
NM_LOGDROP_CAT_UDP_SRC_PORT	UDP-SRC-PORT	UDP source port
NM_LOGDROP_CAT_UDP_DST_PORT	UDP-DST-PORT	UDP destination port
NM_LOGDROP_CAT_ICMP	ICMP	ICMP packet (generic)
NM_LOGDROP_CAT_ICMP_TYPE	ICMP-TYPE	ICMP Type field
NM_LOGDROP_CAT_ICMP_CODE	ICMP-CODE	ICMP Code field
NM_LOGDROP_CAT_ICMP6	ICMPv6	ICMPv6 (generic)

Firewall Log Messages Detail (AT&T Requirement #841)

Reason Enumeration (C)	Log Text Representation	Why the Packet Was Logged
NM_LOGDROP_CAT_POLICY	POLICY	Policy (generic). This currently includes filterset rules, restricted hosts, IPv6 profiles.
NM_LOGDROP_CAT_POLICY_INPUT	POLICY-INPUT-GEN-DISCARD	Packets destined for the CPE that are generically discarded (we specify the packets we <i>do</i> want; the rest are discarded.)
NM_LOGDROP_CAT_POLICY_WAN_MGMT	POLICY-WAN-MGMT-ACCESS	1) Trying to access CPE service from WAN side using LAN-side port 2) Trying to access CPE service from LAN side using WAN-side IP address 3) Trying to access CPE service from WAN side using IPv6
NM_LOGDROP_CAT_POLICY_ICMP_ECHO	POLICY-ICMP-ECHO	ICMP echo request discarded (more specific than NM_LOGDROP_CAT_ICMP_TYPE)
NM_LOGDROP_CAT_POLICY_UWC_RESTRICT	POLICY-UWC-RESTRICT	Packets dropped because of "Universal Wi-Fi Configuration" restrictions (currently unused)
NM_LOGDROP_CAT_POLICY_RESTRICTED_HOST	POLICY-RESTRICTED-HOST	Packets dropped because of "Restricted Host" feature (either content or time restrictions) (currently unused)
NM_LOGDROP_CAT_POLICY_WAN_DNS_QUERY	POLICY-WAN-SIDE-DNS-QUERY	DNS query packets received on a WAN interface
NM_LOGDROP_CAT_POLICY_WAN_DHCP_TO_SRV	POLICY-WAN-SIDE-DHCP-TO-SRVR	DHCP Discover request received on a WAN interface
NM_LOGDROP_CAT_POLICY_AH	POLICY-IPV6-AH	IPv6 packets with AH header (if so configured)
NM_LOGDROP_CAT_POLICY_ESP	POLICY-IPV6-ESP	IPv6 packets with ESP header (if so configured)
NM_LOGDROP_CAT_POLICY_DEP_HEADER	POLICY-DEPRECATED-HEADER	IPv6 packets with deprecated header (currently this only includes routing extension header type 0)
NM_LOGDROP_CAT_POLICY_CAPT_PORTAL	POLICY-CAPTIVE-PORTAL	[IPv6] packets dropped because captive portal is enabled.
NM_LOGDROP_CAT_FLOW	FLOW	Packets rejected as a result of analysis of multiple related packets (generic)
NM_LOGDROP_CAT_FLOW_FLOOD	FLOOD	Packets rejected because of flood-limiting
NM_LOGDROP_CAT_FLOW_PORTSCAN	PORTSCAN	Packets rejected because of port-scan detection
NM_LOGDROP_CAT_FLOW_DOS_OTHER	OTHER-DoS	Packets rejected because of other DoS detection. Currently this includes downstream flows that don't generate upstream responses - specifically addressing IPv6 Neighbor Discovery DoS attacks.

CHAPTER 4 Command Line Interface

The NVG599 VDSL2 Gateway operating software includes a command line interface (CLI) that lets you access your NVG599 device 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:

- ◆ [“Overview” on page 103](#)
- ◆ [“Starting and Ending a CLI Session” on page 105](#)
- ◆ [“Using the CLI Help Facility” on page 106](#)
- ◆ [“About SHELL Commands” on page 106](#)
- ◆ [“SHELL Commands” on page 107](#)
- ◆ [“About CONFIG Commands” on page 118](#)
- ◆ [“CONFIG Commands” on page 121](#)
- ◆ [“Debug Commands” on page 178](#)

CONFIG Commands

- ["Connection Commands" on page 121](#)
- ["Filter Set Commands" on page 124](#)
- ["Queue Commands" on page 129](#)
- ["IP Gateway Commands" on page 132](#)
- ["IPv6 Commands" on page 132](#)
- ["IP DNS Commands" on page 139](#)
- ["IP IGMP Commands" on page 139](#)
- ["NTP Commands" on page 142](#)
- ["Application Layer Gateway \(ALG\) Commands" on page 142](#)
- ["Dynamic DNS Commands" on page 143](#)
- ["Link Commands" on page 143](#)
- ["Management Commands" on page 146](#)
- ["Remote Access Commands" on page 148](#)
- ["Physical Interfaces Commands" on page 150](#)
- ["PPPoE Relay Commands" on page 157](#)
- ["NAT Pinhole Commands" on page 157](#)
- ["Security Stateful Packet Inspection \(SPI\) Commands" on page 158](#)
- ["VoIP Commands" on page 160](#)
- ["System Commands" on page 173](#)

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	Description
arp	Send ARP request
clear	Erase all stored configuration information
clear_certificate	Remove an SSL certificate that has been installed
clear_https_certkey	Remove a secure HTTP certificate key value
clear_firewall_log	Empty the contents of the firewall event log
clear_log	Erase all stored log info in flash memory
configure	Configure unit's options
diagnose	Run self-test
download	Download config file
exit	Quit this shell
ffbb	Show the number of POST fault states
help	Get more: "help all" or "help help"
install	Download and program an image into flash
log	Add a message to the diagnostic log
loglevel	Report or change diagnostic log level
netstat	Show IP information
nslookup	Send DNS query for host
ping	Send ICMP echo request
quit	Quit this shell
6rd-check	Send a 6rd loopback packet to the border gateway
reset	Reset subsystems
restart	Restart unit
show	Show system information
start	Start subsystem
status	Show basic status of unit
telnet	Telnet to a remote host
traceroute	Send traceroute probes
upload	Upload config file
view	Show configuration information
who	Show who is using the shell
wps	Enter Wireless Protection Settings mode

CONFIG Commands	
Command Verbs	Description
delete	Delete configuration list data
help	Display a list of Help command options
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
ip6	IPv6 protocol options
dns	Domain Name System options
gfs	Global filter set options
igmp	IGMP configuration options
ntp	Network Time Protocol options
gateway	Gateway options
link	WAN link options
management	System management options
physical	Physical interface options
dsl	DSL configuration options
enet	Ethernet options
pinhole	Pinhole options
pppoe-relay	Point to Point Protocol over Ethernet relay options
preferences	Shell environment preferences
queue	Queue options
security	Security (firewall) options
system	Gateway's system options
target-ad-insertion	Targeted Ad Insertion (TAI) options
voip	IP Voice (VoIP) configuration 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

To start a CLI session, you need to 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 NVG599 device before you can make a Telnet connection to it. By default, your NVG599 uses 192.168.1.254 as the IP address for its LAN interface. You can use a Web browser to configure the NVG599 IP address.

Logging In

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

Entering the administrator password lets you display and update all NVG599 settings.

When you have logged in successfully, the command line interface lists the user name 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 displays online 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, type **help** or 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

Begin in SHELL mode when you start a CLI session. SHELL mode lets you perform the following tasks:

- ◆ Monitor NVG599 performance
- ◆ Display and reset NVG599 device statistics
- ◆ Issue administrative commands to restart NVG599 device functions

SHELL Prompt

When you are in SHELL mode, the CLI prompt is the name of the NVG599 device followed by a right angle bracket (>). For example, if you open a CLI connection to the NVG599 device named "ARRIS-3000/9437188," you would see **ARRIS-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 an NVG599 device. You are prompted to confirm the **clear** command by entering **yes**.

clear_certificate

Removes an SSL certificate that has been installed.

clear_https_certkey

Removes any Secure HTTP certificate key value installed in the NVG599.

configure

Puts the command line interface into Configure mode, which lets you configure your NVG599 with **config** commands. The **config** commands are described starting on [page 121](#).

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

Installs a file of configuration parameters into the NVG599 device 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 NVG599 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*]

ffbb

Displays the number of times that the NVG599 device has entered a Power-On Self-Test (POST) fault state.

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

Downloads a new version of the NVG599 operating software from a TFTP (Trivial File Transfer Protocol) server, validates the software image, and programs the image into the NVG599 memory. After you install new operating software, you must restart the NVG599 device.

The **server_address** argument identifies the IP address of the TFTP server on which your NVG599 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 NVG599 diagnostic log.

loglevel [level]

Displays or modifies the types of log messages you want the NVG599 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 log level 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 NVG599.

netstat -r

Displays the IP routes stored in your NVG599.

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 NVG599 to issue a series of ICMP Echo requests for a 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.arris.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 NVG599 device's own IP address.

quit

Exits the NVG599 command line interface.

6rd-check [-s size] [-c count] conn_name

Generates and sends 6rd (IPv6 Rapid Deployment) loopback packets to the 6rd gateway.

reset arp

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

reset crash

Clears crash-dump information, which identifies the contents of the NVG599 registers at the point of system malfunction.

reset dhcp server

Clears the DHCP lease table in the NVG599 device.

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 NVG599 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.

restart [seconds]

Restarts your NVG599 device. If you include the optional **seconds** argument, your NVG599 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 NVG599 device.

show bridge interfaces

Displays bridge interfaces maintained by the NVG599 device.

show bridge table

Displays the bridging table maintained by the NVG599 device.

show config

Dumps the ARRIS Gateway's configuration script just as the **script** command does in Configure mode.

show crash

Displays the most recent crash information, if any, for your NVG599 device.

show dhcp server leases

Displays the DHCP leases stored in RAM by your NVG599 device.

show dhcp client

Displays the DHCP clients stored in RAM by your NVG599 device.

show dsl [all]

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

show dsif 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 NVG599 device. Supports display of individual LAN switch port statistics as well as WAN Ethernet statistics (where applicable).

Example:

```
Ethernet driver full statistics - LAN
10/100/1000 Ethernet
Port Status: Link up
```

```
General:
  Transmit OK      : 253
  Receive OK      : 22
  Tx Errors       : 0
  Rx Errors       : 0

Receiver:
  Dropped Packets : 0

Transmitter:
  Collisions      : 0
  Dropped Packet  : 0

Upper Layers:
  Rx No Handler   : 0
  Rx No Message   : 0
  Rx Octets       : 4781
  Rx Unicast Pkts : 22
  Rx Multicast Pkts : 0
  Tx Discards     : 0
  Tx Octets       : 17204

10/100/1000 Ethernet port 1
Port Status: Link down

10/100/1000 Ethernet port 2
Port Status: Link up
Duplex: Full
Speed: 1000BASE-T
  Transmit OK      : 253
  Transmit unicastpkts : 0
  Tx Octets       : 16192
  Tx Collision     : 0
  Receive OK      : 24
  Receive unicastpkts : 0
  Receive errors   : 0
  Rx Octets       : 4781

10/100/1000 Ethernet port 3
Port Status: Link down

10/100/1000 Ethernet port 4
Port Status: Link down

HPNA port 5 (counter values include management traffic)
Port Status: Link up
Duplex: Full
Speed: 200 MBPS
  Transmit OK      : 1702
  Transmit unicastpkts : 1173
  Tx Octets       : 226117
  Tx Collision     : 0
  Receive OK      : 1168
  Receive unicastpkts : 1168
  Receive errors   : 0
  Rx Octets       : 202156

Ethernet driver statistics - Wireless
Port Status: Link down

Ethernet driver full statistics - PTM WAN
Port Status: Link down
```

```
Ethernet driver full statistics - WAN
10/100/1000 Ethernet
Port Status: Link down
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 enet tx-queue

```
"show enet tx-queue"
This is an output of what is should look like:
NOS/128600225699776/UNLOCKED> show enet tx-queue
No transmit software queue configured on Ethernet port 1
No transmit software queue configured on Ethernet port 2
No transmit software queue configured on Ethernet port 3
No transmit software queue configured on Ethernet port 4
No transmit software queue configured on Ethernet port 5
No transmit software queue configured on Ethernet port 6

Ethernet switch queue stats:
Port 1:
  TxQ1: 54257
  TxQ2: 0
```

```
TxQ3: 0
TxQ4: 508
Port 2:
TxQ1: 55767
TxQ2: 0
TxQ3: 0
TxQ4: 508
Port 3:
TxQ1: 0
TxQ2: 0
TxQ3: 0
TxQ4: 0
Port 4:
TxQ1: 0
TxQ2: 0
TxQ3: 0
TxQ4: 0
Port 5:
TxQ1: 92950
TxQ2: 0
TxQ3: 0
TxQ4: 508
```

show group-mgmt

Displays the IGMP Snooping table. See [“IP IGMP Commands” on page 139](#) for detailed explanation.

show ip arp

Displays the Ethernet address resolution table stored in your NVG599 device.

show ip igmp

Displays the contents of the IGMP Group Address table and the IGMP Report table maintained by your NVG599 device.

show ip interfaces

Displays the IP interfaces for your NVG599 device.

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 NVG599 device.

show ipmap

Displays IPMap table (NAT).

show ipv6 interfaces

Displays IPv6 interfaces.

show ipv6 routes

Displays the IPv6 route table.

show ipv6 neighbors

Displays the IPv6 neighbor table.

show ipv6 dhcp server leases

Displays the DHCPv6 server lease table.

show ipv6 statistics

Displays IPv6 statistics information.

show log

Displays blocks of information from the NVG599 diagnostic log. To see the entire log, you can repeat the **show log** command, or you can enter **show log all**.

show firewall-log

Displays blocks of information from the NVG599 firewall log.

show memory [all]

Displays memory usage information for your NVG599 device. If you include the optional **all** argument, your NVG599 will display a more detailed set of memory statistics.

show ptm

Displays statistics information for each PTM session.

show post-results

Displays Power-On Self-Test results.

show pppoe

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

show rootcert

Dumps the Subject line for the list of all the trusted root certificates for the 802.1x supplicant.

show rtsp

Displays RTSP ALG session activity data.

show status

Displays the current status of an NVG599 device, the device's hardware and software revision levels, a summary of errors encountered, and the length of time the device 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.

show voip

Displays VoIP call statistics.

show voiplog

Displays VoIP event logs.

telnet [hostname | ip_address] [port]

Lets you open a Telnet connection to the specified host through your NVG599 device.

- ◆ The **hostname** argument is the name of the device to which you want to connect, for example, **telnet ftp.arris.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 the 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 NVG599 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 NVG599 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 NVG599 device's configuration just as the **view** command does in Configure mode.

who

Displays the names of the current shell and PPP users.

wps

Enters the wireless WPS (Wi-Fi Protected Setup) mode.

WPS Commands

The following commands are available in WPS mode:

pushbutton

Sets the NVG599 device to WPS “pushbutton” mode, initiating protected setup.

pin

Sets the NVG599 device to PIN mode, enabling authorized devices to be identified and added by MAC address personal identification number.

list

Lists the WPS-ready client devices (enrollees) known to the NVG599.

self-pin

Displays the NVG599's own Personal Identification Number (PIN) value.

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 NVG599 device 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 NVG599 device 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 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 NVG599 device. The optional **all** argument displays a more detailed set of ATM statistics.

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 can 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 NVG599 device 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 prompt **ARRIS-3000/9437188 (top) >>** 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 **ARRIS-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 Enter.

```
ARRIS-3000/9437188 (top) >> quit
ARRIS-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 Enter.

```
ARRIS-3000/9437188 (top) >> ip
ARRIS-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 only one CONFIG node starts with “b,” you could enter the 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 following CONFIG command consists of three keywords (**ip**, **dns** and **domain-name**) and one argument (**domain_name_value**).

```
set ip dns domain-name domain_name_value
```

When you use the command to configure your NVG599 device, you would replace the argument with a value appropriate to your site.

For example:

```
set ip dns domain-name arris.com
```

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 can be enclosed in double (") or single (') quotation marks. If the text string includes an embedded space, it must be enclosed in quotation marks. Special characters are represented using backslash notation.
Numbers	Enter numbers as integers, or in hexadecimal format, 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 an NVG599 device.

Displaying Current Gateway Settings

You can use the **view** command to display the current CONFIG settings for your NVG599. 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 NVG599 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 Enter key. To use a different value, type it and press Enter.

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 Enter) to exit. For example:

```
ARRIS-3000/9437188 (top) >> set system
...
system
  name ("ARRIS-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 NVG599 device verifies that all required settings for all services are present and that settings are consistent.

```
ARRIS-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 NVG599 device 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

The **conn** commands are used to create connections, for example, a WAN or LAN connection. There may be more than one of each depending on your model. The **name** commands 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** | **ppp**]**

Specifies whether the **type** of the connection named *name* is static, DHCP, or PPP.

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

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

set conn name *name* lan-type [**private | **public** | **public-delegated**]**

Specifies whether this connection's LAN is private, public, or public-delegated. The default is **private**, the usual type of local network.

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* rip-send [**off | **v1** | **v2** | **v1-compatible** | **v2-md5**]**

Specifies whether the device should use Routing Information Protocol (RIP) broadcasts to advertise its routing tables to other gateways. RIP Version 2 (RIP-2) is an extension of the original Routing Information Protocol (RIP-1) that expands the amount of useful information in the RIP packets. While RIP-1 and RIP-2 share the same basic algorithms, RIP-2 supports several additional features, including inclusion of subnet masks in RIP packets and implementation of multicasting instead of broadcasting (which reduces the load on hosts that do not support routing protocols). RIP-2 with MD5 authentication is an extension of RIP-2 that increases security by requiring an authentication key when routes are advertised. Depending on your network needs, you can configure your device to support RIP-1, RIP-2, or RIP-2MD5.

If you specify v2-MD5, you must also specify a rip-send-key. Keys are ASCII strings with a maximum of 31 characters, and must match the other gateway keys for proper operation of MD5 support. The default is **off**.

set conn name *name* rip-recv [**off | **v1** | **v2** | **v1-compatible** | **v2-md5**]**

Specifies whether the device should use Routing Information Protocol (RIP) broadcasts to update its routing tables with information received from other gateways on the other side of the connection. If you specify **v2-md5**, you must also specify a rip-recv-key. Keys are ASCII strings with a maximum of 31 characters, and must match the other gateway keys for proper operation of MD5 support. The default is **off**.

set conn name *name* icmp-echo-drop [off | on]

If set to **on**, drops echo-requests received on the particular interface. The default is **off**.

set conn name *name* icmp-err-suppress [off | on]

An additional option to suppress ICMP error messages on WAN IP interfaces. 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.

**NOTE:**

You must also set the gateway address OR turn it off, otherwise the settings cannot be saved. See [“IP Gateway Commands” on page 132](#).

Example:

```

NOS/128600225634272/conf
Config Mode v1.3
NOS/128600225634272 (top)>> conn
NOS/128600225634272 (conn)>> set
  conn
(conn) node list ...
  "LAN"
  "WAN"
Select (name) node to modify from list,
or enter new (name) to create.
conn name (?):
  name "LAN"
    link-oid ("LAN") [ LAN | WAN | PPPoE | ]:
    type (static) [ static | dhcpc | ppp ]:
    side (lan) [ lan | wan ]:
    lan-type (private) [ private | public | public-delegated ]:
    mcast-forwarding (off) [ off | on ]:
    rip-send (off) [ off | v1 | v2 | v1-compatible | v2-md5 ]:
    rip-receive (off) [ off | v1 | v2 | v1-compatible | v2-md5 ]:
    fs-egress ("") [ Security | QosUpstream | WanEgress | ]:
    fs-ingress ("") [ Security | QosUpstream | WanEgress | ]:
    static
      ipaddr ("192.168.1.254"):
      netmask ("255.255.255.0"):
      dhcp-server-enable (on) [ off | on ]:
      dhcp-server
        start-addr ("192.168.1.64"):
        end-addr ("192.168.1.253"):
        lease-time (01:00:00:00):
        subnet-order (1) [ 1 - 8 ]:
        gen-option
(gen-option) node list ...
Select (name) node to modify from list,
or enter new (name) to create.
  gen-option name (?):
  option-group
(option-group) node list ...
Select (name) node to modify from list,
or enter new (name) to create.
  option-group name (?):

```

```

filterset
(filterset) node list ...
Select (name) node to modify from list,
or enter new (name) to create.
filterset name (?):
name "WAN"
link-oid ("WAN") [ LAN | WAN | PPPoE | ]:
type (dhcp) [ static | dhcp | ppp ]: static
side (wan) [ lan | wan ]:
mcast-forwarding (off) [ off | on ]:
nat-enable (on) [ off | on ]:
rip-receive (off) [ off | v1 | v2 | v1-compatible | v2-md5 ]:
icmp-echo-drop (on) [ off | on ]:
icmp-err-suppress (off) [ off | on ]:
fs-egress ("WanEgress") [ Security | QoSUpstream | WanEgress | ]:
fs-ingress ("") [ Security | QoSUpstream | WanEgress | ]:
static
ipaddr (""): 10.3.53.100
netmask ("255.255.255.0"):
NOS/128600225634272 (conn)>> set ip gateway address 10.3.53.1
NOS/128600225634272 (conn)>> save
If you do not want the gateway use this command to turn it off:
set ip gateway enable off

```

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 NVG599 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 NVG599. Lease time is in seconds. Default is **3600**.

set conn name *name* dhcp-server subnet-order [1... 8]

If **dhcp-server-enable** is set to **on**, specifies the order in which to address the first of 8 possible subnets. Ordinarily, this is the first one, the default **1**.

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

Specifies whether you want the NVG599 device 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**. The **discover-time** value is in seconds; the default is **30**.

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

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]

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 connection, which is applied to transmitted packets. See [“Filter Set Commands” on page 124](#).

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

Attaches a user filter set to a connection, which is applied to received packets. See [“Filter Set Commands” on page 124](#).

Filter Set Commands

Filter sets 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.

Your NVG599 device is capable of adding and stripping 802.1Q tags to and from frames before transmission on its LAN interfaces. See also [“Link Commands” on page 143](#) for more information.

A maximum of 8 filter sets are supported. Each filter set can have up to 8 rules configured. A maximum 8 egress queues are supported. Each queue can have up to 8 entries.

A filter set 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 filter set rules (1 before 2, etc). If **order** is unspecified, the value of **order** is set to 1 more than the last order in the filter set. If **order** is set to an already existing order value, order values of other rules are incremented automatically.

set filterset name *filterset_name* rule *number* enable [on | off]

Dynamically enables or disables the specified filter set rule.

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-packet-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 filter set's default action: *pass*, *drop*, or *reject*.

set filterset name *filterset_name* rule *number* match-qos-marker-enable [*off* | *on*]

Turns the function of tagging the packet according to the queue marker name on or off. Default is *off*.

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 129](#).

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

Sets the packet TOD 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 filter set.

Default Actions

If a packet passes through all of a filter's rules without a match, then the filter set'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 filter set.

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

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

Global Filter Set (“IPv6 Firewall”) Commands

Global filter sets exist at the root level of the hierarchy, outside the umbrella of both the “ip” and “ip6” subtrees, since they pertain to both.

Global filter set rules allow for the specification of these match attributes:

- ◆ IP Protocol
- ◆ Source and/or destination port:
 - UDP
 - TCP
- ◆ TCP flags, for rules that specify TCP traffic
- ◆ ICMP type, for IP-protocol types 1 (ICMP) and 58 (IPv6-ICMP)
- ◆ LAN-side device/range:
 - By MAC address (or current IPv4/6 address, host name, equivalently)
 - IPv4 address, range, or subnet
 - IPv6 address or subnet
- ◆ WAN-side range:
 - IPv4 address, range, or subnet
 - IPv6 address or subnet
- ◆ Ingress and egress interface, by link-oid (such as “LAN”)

set gfs name *filterset_name* enable [on | off]

Dynamically enables or disables the specified filter set rule.

set gfs name *filterset_name* default-action value [pass | drop]

Executes the named filter set’s default action: **pass** or **drop**.

set gfs name *filterset_name* rule *number* enable [on | off]

Dynamically enables or disables the specified filter set rule.

set gfs name *filterset_name* rule *number* active [on | off]

Activates or deactivates the specified filter set rule.

set gfs name *filterset_name* rule *number* type [either | ipv4 | ipv6]

Specifies whether the named filter set rule applies to IPv4, IPv6, or both (either).

set gfs name *filterset_name* rule *number* action value [pass | drop | accept]

Executes the named filter set’s action: **pass**, **drop**, or **accept**.

set gfs name *filterset_name* rule *number* order *number*

Determines order of execution of filter set rules (1 before 2, etc). If **order** is unspecified, the value of **order** is set to 1 more than the last order in the filter set. If **order** is set to an already existing order value, order values of other rules are incremented automatically.

set gfs name *filterset_name* rule *number* match *number* category [src-ip-addr | dst-ip-addr | ip-proto | src-port | dst-port | tcp-flags | src-host-mac | dst-host-mac | in-link-oid

| out-link-oid | icmp-type]

Matches on the following categories:

src-ip-addr	(ip[4 6] address or subnet spec (type ip4 or ip6 only))
dst-ip-addr	(ip[4 6] address or subnet spec (type ip4 or ip6 only))
ip-proto	(0-255 or iana-defined string equivalents)
src-port	(1-65535[:1-65535], only if ip-proto == TCP or UDP)
dst-port	(1-65535[:1-65535], only if ip-proto == TCP or UDP)
tcp-flags	(only if ip-proto == TCP)
icmp-type	(only if ip-proto == ICMP or IPv6 ICMP)
src-host-mac	(MAC address of src)
dst-host-mac	(MAC address of dest)
in-link-oid	(oid of ingress link oid)
out-link-oid	(oid of egress link oid)

set gfs name *filterset_name* rule *number* match *number* value [*value* (category-specific)]



NOTE:

A rule cannot contain data that specifies both IPv6 and IPv4 at the same time, and thus be applicable to neither **iptables** nor **ip6tables**; however, a rule can be IP-version agnostic, in which case it will be applied to both **iptables** and **ip6tables**, given the proper conditions. For instance, if a LAN-side device has both an IPv4 address and a routable IPv6 address, then one can specify a rule for this device by referring to its MAC address, and if no other match attributes of the rule preclude its use in both tables, the rule will be applied to both **iptables** and **ip6tables** (given the assumption that the LAN Host Discovery database contains both addresses).

Queue Commands

Queue configuration typically requires a classification component to set a QoS marker to a packet and a queuing component to schedule the marked packets to the link. This is accomplished using filter sets ([“Filter Set Commands” on page 124](#)).

The basic queue's size and length are controls for how many packets and total bytes can be enqueued before it is considered to be full. Once it is full, any attempts to enqueue another packet will result in a “tail-drop.”

Both constraints are simultaneously used, such that the queue is full when either packet count *or* byte count exceeds the limit. This allows flexibility in obtaining a balance, where a large number of small packets, but only a small number of large packets can be enqueued.

If there are no tail-drops – that is, the queue is not blocked from sending and doesn't over-fill and dump packets – then these queue size/bytes parameters do not affect anything. Their only function is to adjust the threshold at which the queue is considered full, which dictates when tail-drops will occur. So if there are no tail-drops, then increasing the queue length will have no effect. Increasing the queue length has no effect unless there are tail-drops.

The maximum size/bytes of a queue balances how much burstiness can be buffered versus having a queue that is simply too long.

Burstiness smoothing requires queuing up the buffers. For example, if the upstream line rate is 1 mbps, but the traffic source sends 100 mbps bursts for 10 ms every second (which coincidentally averages 1 mbps) then

the router will have to buffer enough (about a full second worth of traffic) so that the burst of traffic doesn't get tail-dropped when it arrives and is enqueued at the same time in the same burst.

On the other hand, it is undesirable to buffer too much data in the queue(s) since the packets may be stale by the time they are sent. It may be desirable to drop the traffic sufficiently that there are queuing disciplines such as Random Early Discard (RED) that do not drop packets from the tail of the queue. Instead, RED drops packets towards the front of the queue, so that the congestion is noticed more quickly in order for the sender to scale back bandwidth usage to avoid drops.

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 number of packets that can be enqueued.

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

Sets the maximum total number of bytes that can be enqueued.

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... 10000000]

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... 10000000]

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 *ip-proto-mode*** [**bps** | **relative**]**

Sets the mode of the weighted fair queue. The **bps** keyword indicates that weights are defined as bits-per-second. The **relative** keyword 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* entry *number* peak [0... 100,000,000]

Sets the peak level of this weighted fair queue. The **peak** parameter is a number from 0 through 100,000,000 in bits/second. It must be at least 50,000 for best effect. It is the peak data rate allowed on the queue entry, and usually supports bandwidth sharing, that is, if other queues are not busy and there is spare bandwidth, then a busy queue is allowed to go up to the peak rate.

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

Indicates the input queue 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 NVG599 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. The default is **off**. When enabled, the following default configuration is created:

```
set ip6 enable on
set ip6 conn name "WANv6" enable on
set ip6 conn name "WANv6" type rd
set ip6 conn name "WANv6" mtu 1472
set ip6 conn name "WANv6" side wan
set ip6 conn name "WANv6" mcast-forwarding off
set ip6 conn name "WANv6" icmp-echo-drop on
set ip6 conn name "WANv6" traffic-class-clear on
set ip6 conn name "WANv6" 6rd-tunnel type cpe
set ip6 conn name "WANv6" 6rd-tunnel ipv4-conn "WAN"
set ip6 conn name "WANv6" 6rd-tunnel use-dhcp-values off
set ip6 conn name "WANv6" 6rd-tunnel prefix "::"
set ip6 conn name "WANv6" 6rd-tunnel prefix-length 1
set ip6 conn name "WANv6" 6rd-tunnel ipv4-common-bits 0
set ip6 conn name "WANv6" 6rd-tunnel relay-ipv4-addr "0.0.0.0"
set ip6 conn name "WANv6" 6rd-tunnel ipv4-tx-tos-mode off
set ip6 conn name "WANv6" 6rd-tunnel force-tx-to-br on
set ip6 conn name "WANv6" 6rd-tunnel anti-spoof-enable on
set ip6 conn name "WANv6" 6rd-tunnel tx-df-bit-set on
set ip6 conn name "LANv6" enable off
set ip6 gateway enable on
set ip6 gateway conn "WANv6"
set ip6 gateway address "::"
set ip6 dhcp-server enable on
set ip6 dhcp-server information-only off
set ip6 dhcp-server preference 255
set ip6 dhcp-server authoritative on
set ip6 dhcp-server rapid-commit on
set ip6 dhcp-server unicast off
set ip6 dhcp-server leasequery off
set ip6 dhcp-server pd-enable on
set ip6 dhcp-server default-lease-time 2592000
set ip6 dhcp-server preferred-lifetime 604800
set ip6 dhcp-server T1 302400
set ip6 dhcp-server T2 483840
```

```
set ip6 dhcp-server info-refresh-time 86400
set ip6 dns primary-address ""
set ip6 dns secondary-address ""
```

Default IPv6 security configuration values:

```
set security spi ip6 src-mcast-drop off
set security spi ip6 invalid-mcast-scope-drop on
set security spi ip6 forbidden-addr-drop on
set security spi ip6 deprecated-ext-hdr-drop on
set security spi ip6 src-addr-from-lan-unassigned-drop on
set security spi ip6 lan-assigned-src-addr-from-wan-drop on
set security spi ip6 ula-drop on
set security spi ip6 ignore-dns-from-wan on
set security spi ip6 ignore-dhcp-from-wan on
set security spi ip6 esp-hdr-drop on
set security spi ip6 ah-hdr-drop on
set security spi ip6 allow-inbound off
set security spi ip4 invalid-addr-drop on
set security spi ip4 private-addr-drop off
set security spi flood-limit enable off
set security ip6 firewall-level low
set security ip6 enable on
```

ip6 gateway conn

set ip6 gateway enable [on | off]

Enables or disables IPv6 default gateway.

set ip6 gateway conn *value*

Sets the default gateway to point to an associated link specified by the **conn-oid** value. Normally, this would be the WAN connection.

set ip6 gateway address *ipv6_address*

Specifies the IPv6 address of a host on a local or remote network in standard IPv6 format.

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 that 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 the IPv4 connection named *ipv4_name*. See the Internet Engineering Task Force document, “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]

The **off** parameter sets the TOS field in the IPv4 header to zero for transmitted 6rd packets. The keyword **use-ipv6** sets the the TOS field in the IPv4 header to the DS field of the 6rd-encapsulated IPv6 packet.

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

If the **off** parameter is used, each packet set to a destination IPv6 address within the originating 6rd domain is sent directly to the 6rd endpoint. If the keyword **on** is used, 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*

Sets the connection’s SIXXS user name.

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

Sets the connection’s SIXXS password.

Delegated Prefix Connections

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

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

Sets the connection to obtain its prefix from the specified link.

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

Sets the delegated prefix 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 connection'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 connection delegating the prefix remains active in the event that the connection 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 **ip6v6-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 connections 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]

The **on** parameter sets router advertisement to enabled for this connection.

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]

The **on** parameter sets the DHCPv6 server to enabled for this connection.

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 that is assigned to the LAN connection.

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 (optional).

IPv6 DHCP Server

set ip6 dhcp-server enable [on | off]

Globally enables or disables DHCPv6 servers on all IPv6 LAN connections. The default is **on**.

set ip6 dhcp-server information-only [off | on]

The **on** parameter sets DHCPv6 servers on all IPv6 LAN connections to operate in stateless “information-only” mode. The default is **off**.

set ip6 dhcp-server preference 255

Sets the preference option, as defined in RFC1315, sec. 22.8. The preference option in the server’s Advertise message may assist a DHCPv6 client in selecting from more than one server on the LAN.

set ip6 dhcp-server authoritative [on | off]

If a client requests an IP address on a given network segment that the server knows is not valid for that segment, and **authoritative** is set to **on**, the server will respond with a DHCPNAK message, causing the client to forget its IP address and try to get a new one. If **authoritative** is set to **off**, the server will ignore the client’s request. The default is **on**.

set ip6 dhcp-server rapid-commit [on | off]

Enables or disables the rapid commit option per RFC 3315 Section 22.14. The default is **on**.

set ip6 dhcp-server unicast [off | on]

Enables or disables server unicast option per RFC 3315 Section 22.12. The default is **off**.

set ip6 dhcp-server leasequery [off | on]

Enables or disables DHCPv6 Leasequery option per RFC 5007. The default is **off**.

set ip6 dhcp-server pd-enable [on | off]

Enables or disables prefix delegation globally on all DHCPv6 servers on all IPv6 LAN connections, overriding individual DHCPv6 server settings. The default is **on**.

set ip6 dhcp-server default-lease-time *seconds*

Sets the global DHCPv6 lease time setting in seconds. The default is **2592000** (30 days).

set ip6 dhcp-server preferred-lifetime *seconds*

Sets the global DHCPv6 preferred lifetime of prefixes in seconds, per RFC 3633. The default is **604800** (7 days).

set ip6 dhcp-server T1 seconds **set ip6 dhcp-server T2 seconds**

Sets global DHCPv6 T1, T2 values, per RFC 3315 for local NA addresses:

-
- | | |
|-----------|---|
| T1 | The time at which the client contacts the server from which the addresses in the IA_NA were obtained to extend the lifetimes of the addresses assigned to the IA_NA; T1 is a time duration relative to the current time expressed in seconds. Defaults to 302400 (3.5 days). |
| T2 | The time at which the client contacts any available server to extend the lifetimes of the addresses assigned to the IA_NA; T2 is a time duration relative to the current time expressed in seconds. Defaults to 483840 (5.6 days). |

And also per global DHCPv6 T1, T2 values, per RFC 3633 for PD prefixes:

-
- | | |
|-----------|--|
| T1 | The time at which the requesting router should contact the delegating router from which the prefixes in the IA_PD were obtained to extend the lifetimes of the prefixes delegated to the IA_PD; T1 is a time duration relative to the current time expressed in seconds. |
| T2 | The time at which the requesting router should contact any available delegating router to extend the lifetimes of the prefixes assigned to the IA_PD; T2 is a time duration relative to the current time expressed in seconds. |

set ip6 dhcp-server info-refresh-time seconds

In seconds, per RFC 4242: The information refresh time option specifies an upper bound for how long a client should wait before refreshing information retrieved from DHCPv6 in stateless mode. The default is **86400** (24 hours).

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]

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, NVG599 devices use a protocol for forwarding multicasting: Internet Group Management Protocol (IGMP).

NVG599 devices 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 locations 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 source filtering, which is the ability for group memberships to incorporate source address filtering. This ability 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 NVG599 to “listen in” to IGMP traffic. The NVG599 discovers multicast group membership for the purpose of restricting multicast transmissions to only those ports which have requested them. This restriction 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** – 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 the IP profile and the 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: 2 – 255. The default is 2.

set ip igmp query-interval *value*

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

set ip igmp query-response-interval *value*

Sets the query-response interval range in deci-seconds (tenths of a second): 5 – 255. 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 fast-leave [off | on]

Sets fast leave **on** or **off**. Set to **on** 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.

set ip igmp max-group-memberships *value*

Sets the maximum number of IGMP group memberships. Default is **20**.

set ip igmp fwd-admin-groups [off | on]

Turns Admin group forwarding off or on. Default is **off**.

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 default-fwd-allow [on | off]

Turns default forwarding on or off. The default is **on**.

set ip igmp snoop-entry-time *seconds*

The **snoop-entry-time** value 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 the value of **seconds**. If no additional joins are seen, the entry will expire after the value of **seconds**. Default is **130**.

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

The **snooping-unreg-mode** value can be set to **block** or **flood**. This value 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*

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

set ip ntp update-period *minutes*

Specifies how often, in minutes, the gateway should update the clock. Default is **1440**.

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. Because the ALG is the only address seen by the public Internet, 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 (Encapsulating 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 host name, user name for the service, and password. Number of retries defaults to **5**.

Default Server Settings

set ip wan-allocation mode [normal | defaultserver]

Sets the WAN mode to direct your NVG599 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

The **link** commands represent physical connections. Currently, port-based VLAN support is provided at this level. Your NVG599 device is capable of adding and stripping 802.1Q tags to and from frames before transmission on its LAN interfaces. See also [“Filter Set Commands” on page 124](#) and [“Queue Commands” on page 129](#) for more information.

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

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

set link name *name* mtu-override [0 - 1500]

Specifies whether the maximum transmission unit value should be set to other than the standard 1500. A setting of **0** (zero) turns off override.

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-1... 4 | hpna | ssid-1...4 | 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* tagged-vlan name *integer* ports [lan-1... 4 | hpna | ssid-1...4 | ptm | vc-1 | vc-2]

Specifies a tagged VLAN on the selected port on the link named *name*. Default is **ptm**.

set link name *name* tagged-vlan name *integer* vid *vlan_id*

Specifies a VLAN ID (VID) on the selected link named *name*. Default is **0**.

set link name *name* tagged-vlan name *integer* 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* supplicant type [none | eap-tls]

Specifies whether the EAP TLS supplicant is enabled on the link named *name*. Default is **eap-tls**.

set link name *name* supplicant priority [0 - 7]

Sets the supplicant priority on the link named *name* when supplicant type is **eap-tls**. Default is **0**.

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 user name *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 NVG599 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 NVG599 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 NVG599 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 NVG599 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 NVG599 device when it is unused for extended periods. If you specify **always-on**, the NVG599 never shuts down the PPP link. If you specify **instant-on**, the NVG599 shuts down the PPP link after the number of seconds specified in the timeout setting (below) if no traffic is moving over the circuit.

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

Specifies whether you want your NVG599 to send LCP echo requests. You should turn off LCP echoing if you do not want the NVG599 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 NVG599 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 NVG599 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 NVG599 accepts name server addresses from the peer.

- ◆ The default is **on**, which means the NVG599 expects to get name server 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 name server 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 NVG599 to acquire any name server addresses from this PPP connection.

Specifies an ISP name or a class or quality of service. The service name tells the access concentrator which network service the NVG599 is trying to reach.

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

Specifies this particular access concentrator (AC) unit from all others. Some access provider networks may have multiple PPPoE servers, and having the NVG599 indicate an AC name specifies to which one the NVG599 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 NVG599 device. TR-069 protects sensitive data on the NVG599 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 user name 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
```

TR-064

DSL Forum TR-064 (“LAN Side CPE Configuration”) is an extension of UPnP (Universal Plug-and-Play). It defines more services to locally manage the NVG599 device. While UPnP allows open access to configure the device's features, TR-064 requires a password to execute any command that changes the device's configuration.

set management lanmgmt enable [off | on]

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

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

Specifies a timeout period of inactivity for Telnet access to the NVG599 device, after which a user must re-log in to the NVG599. Default is **15** minutes for Telnet.

set management shell ssh-port [1 - 65534]

Specifies the port number for secure shell (SSH) communication with the NVG599. Defaults to port **0** (off).

set management shell telnet-port [1 - 65534]

Specifies the port number for Telnet (CLI) communication with the NVG599 device. 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 NVG599 Telnet configuration interface. A setting of **0** (zero) will turn the server off.

set management upnp enable [off | on]

Turns Universal Plug-and-Play (UPnP) on or off.

set management web http-port [1 - 65534]

Specifies the port number for HTTP (Web) communication with the NVG599 device. 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 NVG599 Web configuration interface. A setting of **0** (zero) will turn the server off.

set management web https-port [1 - 65534]

Sets the secure Web access port for secure management of the NVG599. Default is port **443**.

set management web https-cert-cn *string*

Specifies a certificate from a trusted certificate authority to identify the secure Web access.

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

Specifies a timeout period of inactivity for HTTP access to the NVG599 device, after which a user must log in to the NVG599. 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 NVG599.

set management web isp-help-desk *phone_number_string*

Specifies the ISP Help Desk phone number as it appears in the Web UI. For AT&T, the default is: 1-800-288-2020.

Remote Access Commands

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

Sets the Web access port for remote access management of the NVG599. 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 NVG599, after which a user must log in to the device. 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 NVG599, after which a user must log in to the device. 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 NVG599. 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 NVG599 device, after which a user must log in to the device. 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 NVG599 device, after which a user must log in to the device. 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.

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

Specifies the port number for remote access Telnet (CLI) communication with the NVG599 device. 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 NVG599 Telnet configuration interface. A setting of **0** (zero) will turn the server off. Defaults to port **0**.

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

Specifies a timeout period of inactivity for remote Telnet access to the NVG599 device, after which a user must log in to the device. 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 NVG599 device, after which a user must log in to the device. 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 NVG599. 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 NVG599 device, after which a user must log in to the device. 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 NVG599 device, after which a user must log in to the device. 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** and 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-redirect missing-filter-notify [on | off]

If set to **on** and a missing filter on the line 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 TR-064 ("LAN Side CPE Configuration") is an extension of UPnP (Universal Plug-and-Play). It defines more services to locally manage the NVG599 device. While UPnP allows open access to configure the device's features, TR-064 requires a password to execute any command that changes the device's configuration.

set management lanmgmt enable [off | 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 dsl-mode [auto | single | bonded]

Sets the mode for the DSL connection, whether a **single** line or **bonded**. If the default **auto** is set, the device will try both single and bonded, attempting to detect and lock on the mode in use.

set physical dsl loopback [off | on]

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

set physical dsl annexm [off | on]

Turns optional DSL Annex M off or on. Default is **off**. If enabled, data rates can be as high as 12 or 24 Mbit/s downstream and 3 Mbit/s upstream depending on the distance from the DSLAM to the customer's premises.

set physical dsl modulation auto [off | on]

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

set physical dsl modulation vdsl2 [off | on]

Turns VDSL2 DSL modulation off or on. Default is **on**.

set physical dsl modulation adsl2 [off | on]

Turns ADSL2 DSL modulation off or on. Default is **on**.

set physical dsl modulation adsl2+ [off | on]

Turns ADSL2+ DSL modulation off or on. Default is **on**.

set physical dsl modulation annex-l [off | on]

Turns Annex-L DSL modulation off or on. Default is **off**.

set physical dsl modulation annex-m [off | on]

Turns Annex-M DSL modulation off or on. Default is **off**.

set physical dsl profile-8a [on | off]

Enables or disables VDSL2 profile 8a governing upstream and downstream bandwidth. Default is **on**.

set physical dsl profile-8b [on | off]

Enables or disables VDSL2 profile 8b governing upstream and downstream bandwidth. Default is **on**.

set physical dsl profile-8c [on | off]

Enables or disables VDSL2 profile 8c governing upstream and downstream bandwidth. Default is **on**.

set physical dsl profile-8d [on | off]

Enables or disables VDSL2 profile 8d governing upstream and downstream bandwidth. Default is **on**.

set physical dsl profile-12a [on | off]

Enables or disables VDSL2 profile 12a governing upstream and downstream bandwidth. Default is **on**.

set physical dsl profile-12b [on | off]

Enables or disables VDSL2 profile 12b governing upstream and downstream bandwidth. Default is **on**.

set physical dsl profile-17a [on | off]

Enables or disables VDSL2 profile 17a governing upstream and downstream bandwidth. Default is **on**.

set physical dsl profile-30a [on | off]

Enables or disables VDSL2 profile 30a governing upstream and downstream bandwidth. Default is **off**.

set physical dsl bit-swap [on | off]

Turns DSL bit-swapping on or off. Bit-swapping is resilient to loss of hand-shake commands. Default is **on**.

set physical dsl trellis [on | off]

Turns trellis error correction encoding on or off. Default is **on**.

set physical dsl vectoring-enable [off | on]

Enables or disables VDSL2 vectoring. Vectoring enables VDSL2 to achieve its highest potential data rates, exceeding 100 Mbps. Default is **off**.

set physical dsl vectoring-timeout-ms *milliseconds*

If **vectoring-enable** is set to **on**, specifies a timeout interval in milliseconds. Default is **5000**.

set physical dsl nlnm-threshold [0 - 480]

Specifies the New Low Noise Model (NLNM) value between 0 and 480. Default is **60**.

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

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

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 dsl atm vcc 1 auto-vpi-vci [on | off]

Turns automatic VPI/VCI detection on or off. If you leave the default **on**, the device will try a series of VPI/VCI pairs that are commonly used by service providers. When one pair succeeds, the device will use this one for future connections.

set physical dsl atm vcc 1 vpi-vci-list *vpi_vci_pairs*

Specifies the series of VPI/VCI pairs that the device will use to attempt a connection. The default set ("0/35 8/35 0/43 0/51 0/59 8/43 8/51 8/59") can be changed.

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

Turns QoS off or on on the virtual circuit. Default is **off**.

set physical dsl power-save enable [off | on]

Turns power saving mode off or on. Default is **off**.

Ethernet Interfaces

set physical enet [1 - 4] mac-addr-override *mac_addr*

You can override your NVG599 device'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 - 4] 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 - 4] port mdix [auto | on | off]

Sets the Ethernet port's crossover detection. Default is **off**.

set physical enet [1 - 4] tx-queue *queue_name*

Attaches the egress queue template to the Ethernet interface when the queue type is egress.

set physical enet [1 - 4] rx-queue *queue_name*

Attaches the ingress queue to the Ethernet interface when the queue type is ingress.

set physical enet [1 - 4] port power-save enable ""

Turns power saving mode off or on.

set physical ensw max-age *seconds*

Sets the maximum delay on the Ethernet switch in seconds. Default is **300** (5 minutes).

set physical ensw qos-mode [off | p-bit]

Sets QoS up on Ethernet switch, classified by priority-bit mapping. Default is **off**. When **p-bit** is selected, packets will be mapped from their priority (even if untagged) to one of four queues per-port in the Ethernet switch.

See ["Quality of Service \(QoS\) Examples" on page 217](#) for more information.



NOTE:

This setting only applies to packets sent from the host CPU to a switch port; it does not apply to port-to-port traffic.

set physical ensw p-bit-map *pbit-to-4queue-map*

Sets the mapping from the 8 priority-bits to the four queues in the Ethernet switch. The lowest priority queue is "1", and the highest priority queue is "4".

Example: Mapping is "1 1 2 2 3 3 4 4", where priority bit values 0 and 1 would map to queue 1, and values 2 and 3 would map to queue 2, etc.

Wireless Interfaces

set physical wireless enable [on | off]

Enables or disables the wireless capability for supported Wi-Fi devices. Default is **on**.

set physical wireless standard [bg | b-only | g-only | bgn | n-only | an | a-only]

Sets and locks the NVG599 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 selection on or off.

set physical wireless bandwidth [narrow | wide]

Specifies whether the Wi-Fi channel is narrow or wide band. Default is **narrow** in compliance with FCC requirements.

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 2.4 Ghz band. 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 NVG599 device is located close to other Wi-Fi devices and causes interference. Defaults to **100** (percent).

set physical wireless mul2uni [off | on]

Turns wireless “many-to-one” packet scheduling off or on. Default is **off**.

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 of the form “ATTxxx”.

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 SSID hiding 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 WLAN side of the NVG599. 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.

set physical wireless wmm power-save [off | on]

Turns power saving mode off or on for wireless multimedia when **wmm enable** is on. Default is **on**.

PPPoE Relay Commands



NOTE:

When configuring a PPPoE connection, you must also configure the required PPPoE authentication details (such as user name and password combinations) on the client computer.

set pppoe-relay enable [on | off]

Allows the NVG599 device 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 NVG599. 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 NVG599 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 NVG599 device'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 NVG599 device 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 ip4 invalid-addr-drop [on | off]

Enables or disables whether broadband packets with invalid source or destination addresses should be dropped. Default is **on**.

set security spi ip4 private-addr-drop [on | off]

Enables or disables whether broadband packets with private source or destination addresses should be dropped. Default is **off**.

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 ip4 invalid-addr-drop [on | off]

Blocks broad sets of addresses that should not be used as either source or destination addresses, or both. These include the following:

IP address/mask	Source or destination
10.0.0.0/8	source
192.168.0.0/16	source
169.254.0.0/16	source
172.16.0.0/12	source
224.0.0.0/4	Source / destination
224.0.0.0/5	Source / destination
0.0.0.0/8	Source / destination
255.255.255.255	destination

The default is **on**.

set security spi ip4 private-addr-drop [off | on]

Drops packets sourced or destined for private IPv4 addresses. The default is **off**.

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. Defaults to **4**.

set security spi flood-limit burst-limit *max_value*

Sets a maximum value in a packet-burst for packet flood criterion. Defaults to **8**.

set security spi flood-limit icmp enable [on | off]

Enables or disables whether ICMP packet flooding should be detected and offending packets be dropped. Defaults to **on**.

set security spi flood-limit udp enable [off | on]

Enables or disables whether UDP packet flooding should be detected and offending packets be dropped. Defaults to **off**.

set security spi flood-limit tcp enable [off | on]

Enables or disables whether TCP packet flooding should be detected and offending packets be dropped. Defaults to **off**.

set security spi flood-limit tcp syn-cookie [on | off]

Allows TCP SYN cookies flooding to be excluded. Defaults to **on**.

Reflexive ACL

set security spi ip6 allow-inbound [on | off]

Turns reflexive ACL on or off for IPv6.

Reflexive access control lists (ACL) provide that Layer 4 session information is used to make decisions about what packets to route. Reflexive ACL reduces exposure to spoofing and denial-of-service attacks, because desired inbound packet flows are usually in response to outbound traffic.

ARRIS 9.x DSL gateways use the relevant session information about whether the packet flow was initiated from the LAN side (upstream) or WAN side (downstream). If the parameter **security.spi.ip6.allow-inbound** is set to **off**, then sessions which are initiated from the WAN side are disallowed. Upstream sessions are never precluded because of reflexive ACL. (Of course there may be other reasons that particular packets are dropped.)

For IPv4, NAT is generally enabled, thus reflexive ACL is usually not an issue.

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 ARRIS 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.

VoIP Profile Settings

set voip profile [1 - 4] prof-enable [on | off]

Enables or disables the use and configuration of the specified VoIP profile on the NVG599.

set voip profile [1 - 4] proxy-server *address*

Specifies the IP address or fully-qualified domain name of the SIP proxy server that stations using the profile will connect to.

set voip profile [1 - 4] proxy-port *port*

Sets the well-known port number the station using the profile will use to connect to the SIP proxy. Default is **5060**.

set voip profile [1 - 4] proxy-transport **udp**

Assigns a proxy transport protocol to the VoIP profile. Default is **udp**.

set voip profile [1 - 4] registrar-server *address*

Specifies the IP address or fully-qualified domain name of the SIP registrar (server) that stations using the profile will connect to.

set voip profile [1 - 4] registrar-port *portnumber*

Sets the well-known port number the user agent using the profile will use to connect to the SIP registrar. Default is **5060**.

set voip profile [1 - 4] registrar-transport [**tcp | **udp** | **tls**]**

Assigns a registrar transport protocol to the VoIP profile. Default is **udp**.

set voip profile [1 - 4] sip-expires [0 – 65535]

Specifies the SIP registration server timeout duration from 0 – 65535 seconds for the specified profile. Default is **3600** (1 hour).

set voip profile [1 - 4] outbound-proxy-server *address*

Specifies the SIP outbound proxy server for the specified profile by fully qualified server name or IP address.

set voip profile [1 - 4] outbound-proxy-port *portnumber*

Specifies the SIP outbound proxy server port for the specified profile. Default is **5060**.

set voip profile [1 - 4] sip-user-domain *name*

Sets the SIP user domain value to be used by the VoIP profile.

set voip profile [1 - 4] sip-user-port [1 - 65535]

Specifies the SIP user port for the specified phone, Default is **5060**.

set voip profile [1 - 4] sip-user-transport [tcp | udp]

Assigns a transport protocol to the identified VoIP SIP profile. Default is **udp**.

set voip profile [1 - 4] invite-expires *seconds*

Assigns the “lifespan” of a SIP INVITE message for the identified profile.

set voip profile [1 - 4] reinvite-expires *seconds*

Sets the amount of time a SIP user agent with the named profile will consider a re-INVITE message valid.

set voip profile [1 - 4] reg-retry-interval *seconds*

Specifies the number of seconds that must elapse before a SIP user agent using the named profile may attempt to retry registration.

set voip profile [1 - 4] reg-min-expires *seconds*

Assign the profile a minimum length of time until a registration expires and must be renewed.

set voip profile [1 - 4] registration-period *seconds*

Sets the amount of time that a registration remains valid.

set voip profile [1 - 4] max-retrans-invite *times*

Assigns the profile a maximum number of INVITE message retries. Default: **3**.

set voip profile [1 - 4] max-retrans-non-invite *times*

Assigns the profile a maximum number of non-INVITE message retransmissions. Default: **4**.

set voip profile [1 - 4] sip-publish-method PUBLISH

Sets the specified profile’s SIP event state publication method to PUBLISH.

set voip profile [1 - 4] sip-publish-destination "DEFAULT"

Sets the specified profile’s SIP event state published destination to DEFAULT.

set voip profile [1 - 4] sip-publish-destination2 "NULL"

Clears (assign to NULL) the specified SIP profile’s second published destination.

set voip profile [1 - 4] sip-publish-invocation never

Sets the specified profile to never invoke PUBLISH.

set voip profile [1 - 4] sip-publish-interval seconds

Assigns the publication interval to the specified profile.

set voip profile [1 - 4] sip-publish-count -1

Sets the number of SIP publication events for the profile.

set voip profile [1 - 4] sip-advanced-setting sip-hk-flash-mode info

Assigns a SIP HK Flash mode to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-session-refresher auto

Assigns a SIP session refresh method to the identified profile.

set voip profile [1 - 4] sip-advanced-setting sip-session-timer-value [value]

Configures the SIP session timer value for the profile. Default: **2280**.

set voip profile [1 - 4] sip-advanced-setting sip-dynamic-payload [value]

Sets the dynamic payload value for the identified profile. Default: **101**.

set voip profile [1 - 4] sip-advanced-setting sip-dtmf-mode [inband | rfc2833 | info]

Assigns a DTMF signaling mode for the SIP profile.

- ◆ **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.

Default: **rfc2833**.

set voip profile [1 - 4] sip-advanced-setting sip-digit-map "O=15,l=6,S=3(*#101<:@C03>|*#103<:@C06>|T0|T*xx|T*xxx|E[2-9]11|E[01]911|1[2-9]xxxxxxxxx|T[2-9]xxxxxx|[2-9]xxxxxxxxxn.)"

Assigns the specified digit map to the SIP profile.

set voip profile [1 - 4] sip-advanced-setting sip-compact-header [on | off]

Sets the profile to use compact format when set to **on**. Sends the SIP messages with compact headers, reducing the size of the SIP messages.

set voip profile [1 - 4] sip-advanced-setting sip-q-value [0 - 10]

Assigns a prioritizing SIP q-value to the profile. Default: **10**.

set voip profile [1 - 4] sip-advanced-setting sip-qos-tos [0 - 255]

Specifies the SIP DiffServ type of service (ToS) values for Quality of Service (QoS) assignment. Default: **160**.

set voip profile [1 - 4] sip-advanced-setting sip-qos-p-bit [0 - 7]

Assigns a Quality of Service priority bit (p-bit) value to the SIP profile. Default: **6**.

set voip profile [1 - 4] sip-advanced-setting sip-qos-marker [value]

Assigns a QoS packet marker to the SIP profile. Default: **VO**.

set voip profile [1 - 4] sip-advanced-setting fax-redundancy-level [0 - 1]

Specifies the level of fax redundancy for t38 fax data rate management. Default: **1**.

set voip profile [1 - 4] sip-advanced-setting sip-init-de-register [on | off]

Turns SIP de-registration on or off for the profile. Default: or both.

set voip profile [1 - 4] sip-advanced-setting sip-known-ip-list "[string]"

Specifies a known IP address list of SIP servers for the SIP profile.

set voip profile [1 - 4] sip-advanced-setting sip-allow-ip-list "[string]"

Defines a string of named SIP servers that the profile may use.

set voip profile [1 - 4] sip-advanced-setting sip-t1-timer-value 500

Assigns a SIP t1 (estimated round trip time) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-t2-timer-value 4000

Assigns a SIP t2 (maximum non-INVITE retransmit time) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-t4-timer-value 5000

Assigns a SIP t4 (message clear time) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-a-value 500

Assigns a SIP A timer (UDP INVITE retransmit interval) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-b-value 32000

Assigns a SIP B timer (INVITE transaction timeout) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-c-value 0

Assigns a SIP C timer value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-d-value 32000

Assigns a SIP D timer (response retransmission time) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-e-value 500

Assigns a SIP E timer (UDP non-INVITE retransmit interval) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-f-value 32000

Assigns a SIP F timer (non-INVITE retransmit interval) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-g-value 500

Assigns a SIP G timer (INVITE response retransmit interval) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-h-value 32000

Assigns a SIP H timer (ACK receipt wait time) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-i-value 5000

Assigns a SIP I timer (ACK retransmit wait time) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-j-value 32000

Assigns a SIP J timer (non-INVITE retransmit request wait time) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-timer-k-value 0

Assigns a SIP K timer (response retransmission wait time) value to the profile.

set voip profile [1 - 4] sip-advanced-setting sip-reset-code "code"

Sets the SIP reset code for the profile. Default: **101**

set voip profile [1 - 4] sip-advanced-setting sip-timer-shortinterdigit-value [value]

Sets an interdigit (short) timer value for the profile. Default: **0**

set voip profile [1 - 4] sip-advanced-setting sip-timer-interdigit-value [value]

Sets an interdigit timer value to the profile. Default: **0**.

set voip profile [1 - 4] rtp-advanced-setting rtp-qos-tos [value]

Assigns a Real Time Protocol terms of service number code to the VoIP profile. Default: **184**.

set voip profile [1 - 4] rtp-advanced-setting rtp-qos-p-bit [0 - 7]

Sets a Real Time Protocol Priority bit (P-bit) value to the VoIP profile. Default: **6**.

set voip profile [1 - 4] rtp-advanced-setting rtp-qos-marker "string"

Assigns a Real Time Protocol QoS packet marker to the VoIP profile. Default **VO**.

set voip profile [1 - 4] rtp-advanced-setting rtp-port-range-start [value]

Defines the beginning of the VoIP Real Time Protocol port range assigned to the profile. Default: **6002**.

set voip profile [1 - 4] rtp-advanced-setting rtp-port-range-end [value]

Defines the end of the VoIP Real Time Protocol port range assigned to the profile. Default: **6200**.

set voip profile [1 - 4] rtp-advanced-setting rtcp-option [on | off]

Configures the Real Time Control Protocol (RTCP) setting for the VoIP profile.

set voip profile [1 - 4] rtp-advanced-setting rtcp-repeat-interval [value]

Assigns a Real Time Control Protocol repeat interval value to the VoIP RTP profile. Default: **5000**

set voip profile [1 - 4] advanced-telephony-setting fxs-port-setting-for-fxo [none | fxs1 | fxs2 | both | emgncy]

Sets a port to be used for the FXS (foreign exchange station) interface port to the FXO (foreign exchange office) interface—the phone—port. Default is **none**.

set voip profile [1 - 4] advanced-telephony-setting t38-option [on | off]

Enables or disables T.38 fax capability for the VoIP profile.

set voip profile [1 - 4] advanced-telephony-setting sip-dynamic-line-selection [on | off]

Turns dynamic (next available) line selection off or on for the identified VoIP profile. Default is **off**.

set voip profile [1 - 4] advanced-telephony-setting sip-dns-ns [on | off]

Enables or disables SIP DNS NS records (for Authoritative Name Server zone specification).

set voip profile [1 - 4] advanced-telephony-setting sip-dns-naptr [on | off]

Enables or disables the Name Authority Pointer (NAPTR) DNS function in the SIP profile.

set voip profile [1 - 4] advanced-telephony-setting sip-dns-srv [on | off]

Enables or disables the use of DNS Service Locator (SRV) functions in the profile.

set voip profile [1 - 4] advanced-telephony-setting announcement-setting announcement-battery-alert-option [on | off]

Enables or disables the autonomous announcement of battery alert conditions in the VoIP profile.

set voip profile [1 - 4] advanced-telephony-setting battery-notification-setting battery-notification-interval [value]

Specifies the number of seconds between battery notification messages.

set voip profile [1 - 4] advanced-telephony-setting battery-notification-setting battery-notification-tod-start "[HH:MM]AM | [HH:MM]PM"

Assigns a start time for battery notification message generation to the profile.

set voip profile [1 - 4] advanced-telephony-setting battery-notification-setting battery-notification-tod-end "[HH:MM]AM | [HH:MM]PM"

Assigns an end time for battery notification message generation to the profile.

set voip profile [1 - 4] advanced-telephony-setting testline-setting voip-testline-mode Always

Assigns a line test mode to the VoIP profile specified.

set voip profile [1 - 4] advanced-telephony-setting testline-setting voip-testline-maxlenX5s [value]

Sets the maximum X5s length to the profile's testline settings. Default: 6.

set voip profile [1 - 4] advanced-telephony-setting testline-setting voip-testline-maxfreq [value]

Sets the maximum frequency of line tests for the VoIP profile. Default: 10.

set voip profile [1 - 4] user-account [1 - 4] enable [on | off]

Enables or disables the identified VoIP user account (individual account) on the specified VoIP profile.



NOTE:

User account settings may be specified for disabled user accounts, but the features will not be available unless the account is enabled.

set voip profile [1 - 4] user-account [1 - 4] voip-testline-option [on | off]

Enables or disables the test line option for the named user account on the VoIP profile. Default: **off**.

set voip profile [1 - 4] user-account [1 - 4] fxs-line 1

Sets a line in the user account to support FXS (foreign exchange station) interface. Default is **none**.

set voip profile [1 - 4] user-account [1 - 4] sip-user-disp-name "[string]"

Assigns a display name for the identified user account on the specified VoIP profile. Default: **1000**.

set voip profile [1 - 4] user-account [1 - 4] sip-user-name "[string]"

Adds a user name value to the VoIP profile SIP user account. Default: **1000**.

set voip profile [1 - 4] user-account [1 - 4] sip-user-password "[string]"

Sets the SIP password for the user account on the VoIP profile.

set voip profile [1 - 4] user-account [1 - 4] sip-user-auth-id “[string]”

Defines a user authentication ID value for the user account on the VoIP profile. Default: **1000**.

set voip profile [1 - 4] user-account [1 - 4] sip-uri ""

Assigns a SIP Uniform Resource Identifier (URI) to the specified user account.

set voip profile [1 - 4] user-account [1 - 4] sip-subscribe-expires [time]

Sets the expiration timer value for SIP subscriptions by the identified user account. Default: **3600**.

set voip profile [1 - 4] user-account [1 - 4] sip-service-outage-detect [on | off]

Enables or disables the detection of SIP service outages by the user account.

set voip profile [1 - 4] user-account [1 - 4] codec G711U priority [1 - 7 | none]

Assigns a priority value to the Mu-law (G711U) codec on the user account. Default: **1**

set voip profile [1 - 4] user-account [1 - 4] codec G711U packetization-time [value]

Assigns a packetization time value to the Mu-law (G711U) codec on the user account. Default: **20**

set voip profile [1 - 4] user-account [1 - 4] codec G711A priority [1 - 7 | none]

Assigns a priority value to the a-law (G711A) codec on the user account. Default: **2**

set voip profile [1 - 4] user-account [1 - 4] codec G711A packetization-time [value]

Assigns a packetization time value to the a-law (G711A) codec on the user account. Default: **20**

set voip profile [1 - 4] user-account [1 - 4] codec G729 priority [1 - 7 | none]

Assigns a priority value to the G.729 codec on the user account. Default: **7**

set voip profile [1 - 4] user-account [1 - 4] codec G729 packetization-time [value]

Assigns a packetization time value to the G.729 codec on the user account. Default: **20**

set voip profile [1 - 4] user-account [1 - 4] codec G729 annexb-support [on | off]

Enables or disables G.729 Annex-B support on the specified user account. Default: **off**.

set voip profile [1 - 4] user-account [1 - 4] codec G726_16 priority [1 - 7 | none]

Assigns a priority value to the 16 kbit/s G.726 codec on the user account. Default: **3**.

set voip profile [1 - 4] user-account [1 - 4] codec G726_16 payload-type [value]

Assigns a payload value to the 16 kbit/s G.726 codec on the user account. Default: 102.

set voip profile [1 - 4] user-account [1 - 4] codec G726_16 packetization-time [value]

Assigns a packetization time value to the 16 kbit/s G.726 codec on the user account. Default: 20

set voip profile [1 - 4] user-account [1 - 4] codec G726_24 priority [1 - 7 | none]

Assigns a priority value to the 24 kbit/s G.726 codec on the user account. Default: 4

set voip profile [1 - 4] user-account [1 - 4] codec G726_24 payload-type [value]

Assigns a payload value to the 24 kbit/s G.726 codec on the user account. Default: 103

set voip profile [1 - 4] user-account [1 - 4] codec G726_24 packetization-time [value]

Assigns a packetization time value to the 24 kbit/s G.726 codec on the user account. Default: 20

set voip profile [1 - 4] user-account [1 - 4] codec G726_32 priority [1 - 7 | none]

Assigns a priority value to the 32 kbit/s G.726 codec on the user account. Default: 5.

set voip profile [1 - 4] user-account [1 - 4] codec G726_32 packetization-time [value]

Assigns a packetization time value to the 32 kbit/s G.726 codec on the user account. Default: 20

set voip profile [1 - 4] user-account [1 - 4] codec G726_40 priority [1 - 7 | none]

Assigns a priority value to the 40 kbit/s G.726 codec on the user account. Default: 6.

set voip profile [1 - 4] user-account [1 - 4] codec G726_40 payload-type [value]

Assigns a payload value to the 40 kbit/s G.726 codec on the user account. Default: 105.

set voip profile [1 - 4] user-account [1 - 4] codec G726_40 packetization-time [value]

Assigns a packetization time value to the 40 kbit/s G.726 codec on the user account. Default: 20

set voip profile [1 - 4] user-account [1 - 4] codec AMR priority [1 - 7 | none]

Assigns a priority value to the Adaptive Multi-Rate (AMR) - Narrowband audio codec on the user account. Default: none.

set voip profile [1 - 4] user-account [1 - 4] codec AMR payload-type [value]

Assigns a payload value to the AMR codec on the user account. Default: **120**

set voip profile [1 - 4] user-account [1 - 4] codec AMR packetization-time [value]

Assigns a packetization time value to the AMR codec on the user account. Default: **20**

set voip profile [1 - 4] user-account [1 - 4] codec AMR_WB priority [1 - 7 | none]

Assigns a priority value to the Adaptive Multi-Rate Wideband (AMR-WB) audio codec on the user account. Default: **none**.

set voip profile [1 - 4] user-account [1 - 4] codec AMR_WB payload-type [value]

Assigns a payload value to the AMR-WB codec on the user account. Default: **122**

set voip profile [1 - 4] user-account [1 - 4] codec AMR_WB packetization-time [value]

Assigns a packetization time value to the AMR-WB codec on the user account. Default: **20**

set voip profile [1 - 4] user-account [1 - 4] call-feature call-forwarding-all-option [on | off]

Turns unconditional call forwarding on or off for the specified user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature call-forwarding-on-busy-option [on | off]

Enables or disables call forwarding when the line is busy for the specified user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature call-forwarding-on-no-answer-option [on | off]

Turns no-answer call forwarding on or off for the specified user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature call-waiting-option [on | off]

Enables or disables call waiting for the specified user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature call-conferencing-option [on | off]

Enables or disables 3-way conferencing for the user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature do-not-disturb-option [on | off]

Activates or deactivates the ring-prevention (do not disturb) option for the specified user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature subscribe-mwi-option [on | off]

Enables or disables the message waiting indicator for the user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature subscribe-send-message [on | off]

Enables or disables message sending for the user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature anonymous-call-block-option [on | off]

Sets the user account to block (on) or accept (off) calls from unidentified sources.

set voip profile [1 - 4] user-account [1 - 4] call-feature call-transfer-option [on | off]

Enables or disables the call transfer function on the user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature call-disconnsupervision-option [on | off]

Enables or disables disconnection supervision on the user account.

set voip profile [1 - 4] user-account [1 - 4] call-feature call-osi-signaldur [value]

Assigns an OSI signal duration value to the account. Default: 800.

set voip profile [1 - 4] user-account [1 - 4] dsp-settings echo-option [echo-off | echo-on | echo-on-nlp | echo-on-cng-nlp]

Specifies the conditions under which the user account will invoke or disable echo cancellation. Default: echo-on-cng-nlp

set voip profile [1 - 4] user-account [1 - 4] dsp-settings echo-tail-length 0

Specifies the length of the Digital Signal Processor (DSP) echo tail in milliseconds. Default: 0.

set voip profile [1 - 4] user-account [1 - 4] dsp-settings vad-option [on | off]

Enables or disables voice activity detection (VAD) in the DSP for the user account.

Targeted Ad Insertion Commands

set targeted-ad-insertion enable [on | off]

Turns targeted ad insertion on or off. Default is **on**.

set targeted-ad-insertion v-zone-ad [on | off]

Specifies whether the targeted ad is zone-specific. Default is **on**.

set targeted-ad-insertion sender-ssrc [0... n]

Specifies the synchronization source identifier for the sender.

set targeted-ad-insertion carousel-ip-address *ip_address*

Specifies the IP address of the ad carousel server.

set targeted-ad-insertion carousel-port [0... n]

Specifies the port of the ad carousel server.

set targeted-ad-insertion vcc-group-id [0... n]

Specifies the VCC group identifier of the ad carousel server.

set targeted-ad-insertion key-identification-counter [0... n]

Sets a counter value for the ad key identifier.

set targeted-ad-insertion authentication-key *string*

Specifies an authentication key for the targeted ads.

set targeted-ad-insertion channel-change-notification [on | off]

Turns the “change the channel” notification on or off. Default is **on**.

set targeted-ad-insertion retransmit [on | off]

Turns ad retransmission on or off. Default is **on**.

set targeted-ad-insertion unicast-filter [on | off]

Turns unicast filtering on or off. Default is **on**.

set targeted-ad-insertion blocked-unicast-sources *string*

Specifies names of unicast targeted ad sources to be blocked.

set targeted-ad-insertion hello-interval *seconds*

Specifies an interval for ad insertion in seconds. Default is **7200** (2 hours).

set targeted-ad-insertion hello-retransmit-min *seconds*

Specifies a minimum interval for retransmission of ad insertion in seconds. Default is 15 seconds.

set targeted-ad-insertion hello-retransmit-max *seconds*

Specifies a maximum interval for retransmission of ad insertion in seconds. Default is 300 seconds.

set targeted-ad-insertion vcc-ip-address *ip_address*

Specifies the VCC IP address of the ad carousel server.

set targeted-ad-insertion vcc-port [0... n]

Specifies the VCC port of the ad carousel server.

set targeted-ad-insertion zones *zone_number*

Specifies the zone for targeted ads when **v-zone-ad** is set to **on**.

set targeted-ad-insertion during-ad-timeout *value*

Sets a timeout value. Default is 25,000.

System Commands

set system name *name*

Specifies the name of your NVG599 device. Each NVG599 is assigned a name as part of its factory initialization. The default name for an NVG599 device consists of the word “ARRIS-7000/XXX” where “XXX” is the serial number of the device; for example, ARRIS-7000/9437188. A system name can be 1 – 255 characters long. Once you have assigned a name to your NVG599, you can enter that name in the address text field of your browser to open a connection to your NVG599.



NOTE:

Some broadband cable-oriented service providers use the system name as an important identification and support parameter. If your NVG599 device 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]

A **time-zone** setting 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 persist [on | off]

When set to **on**, causes the log information to be kept in flash memory. Default is **off**.

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 fastpath software-enable [on | off]

Enables or disables the fastpath accelerator processor. Fastpath works on only TCP and UDP. Default is **on**.

set system fastpath hardware-enable [off | on]

Enables or disables the fastpath accelerator processor. Default is **off**.

set system fastpath mcast-mode 3

Sets the mode for multicast on the fastpath accelerator processor.

set system scheduler enable [off | on]

Turns the system scheduler feature on or off. The default is **off**.

set system scheduler enable-time *hr:min*

Specifies a time at which to turn the system on. Default is midnight (00:00). The **enable-time** parameter must be supplied in 24-hour military time, colon separated, for example "05:21".

set system scheduler disable-time *hr:min*

Specifies a time at which to turn the system off. Default is 5 o'clock (05:00). The **disable-time** parameter must be supplied in 24-hour military time, colon separated, for example "21:44".

set system calendar-update enable [on | off]

Turns the calendar update feature on or off. The device will periodically poll the update server for new operating system software. The default is **on**.

set system calendar-update interval [monthly | biweekly]

Specifies how often the device should poll the update server, monthly or biweekly. The default is **monthly**.

set system calendar-update protocol [http | https | tftp]

Specifies the protocol for accessing the update server. The default is **http**.

set system calendar-update server *server_address*

Specifies the address of the update server by name or IP address. The default is "cpems.bellsouth.net".

set system calendar-update username *string*

Specifies the user name for the update server. The default is **anonymous**.

set system calendar-update password *string*

Specifies the password for the update server. The default is **guest**.

set system calendar-update fwverfile *filename*

Specifies the firmware version filename to the update server. For the AT&T NVG599 the file is **netopiaNVG599_64.txt**.

set system calendar-update day *day_of_month*

Specifies the numerical day of the month for the update server to be polled, for example, **21**.

set system calendar-update time *hr:min_AMPM*

Specifies the time of day for the update server to be polled, in the format HOUR:MINUTEAM/PM. For example: **06:00AM**.

set system supplicant enable [on | off]

Turns on the 802.1x supplicant functionality. You must set the corresponding **type** field in the WAN link to activate it:

```
NOS/142253966608 (top)>> set link name WAN supplicant
supplicant
  type (none) [ none | eap-tls ]:
  priority (0) [ 0 - 7 ]:
```

Default is **on**.

set system supplicant dest-broadcast [off | on]

Mostly useful for debugging. If this is set to **on**, the destination MAC address FF:FF:FF:FF:FF:FF is used when the supplicant sends 802.1x packets. If this is **off**, the EAPOL-specific destination address of 01:80:C2:00:00:03 is used. Default is **off**.

set system supplicant eap-tls-identity *string*

Sets the identity sent by the supplicant in response to an Identity request from an 802.1x authenticator.

set system supplicant server-cert-check [on | off]

If set to **on**, examines the certificate chain sent by an 802.1x authenticator for validation, and ensures that the root cert of this chain is accepted by the CPE (is in its trust list). Default is **on**.

set system syslog enable [on | off]

Enables or disables the NVG599 Syslog function. The Syslog function is disabled by default. If Syslog is enabled, the following additional Syslog settings may be configured:

- ◆ [set system syslog server-ip <IPv4/IPv6 Address>](#)
- ◆ [set system syslog server-port <port>](#)
- ◆ [set system syslog facility \[local0 ... local7 \]](#)
- ◆ [set system syslog level \[0 ... 7 \]](#)
- ◆ [set system syslog log-system \[on | off \]](#)
- ◆ [set system syslog log-firewall \[on | off \]](#)
- ◆ [set system syslog log-igmp \[on | off \]](#)
- ◆ [set system syslog log-voice \[on | off \]](#)

You must specify the Syslog server's IP address and any custom UDP port number to identify system logging messages with the [set system syslog server-ip <IPv4/IPv6 Address>](#) and [set system syslog server-port <port>](#) commands. After the Syslog server is specified, you may turn on any or all of the logging categories.

The receiving server must have a properly configured Syslog server package active.

set system syslog server-ip <IPv4/IPv6 Address>

Specifies the IP address (in IPv4 dotted decimal notation or IPv6 colon-separated hexadecimal notation) of the server that Syslog messages will be sent to.

set system syslog server-port <port>

Customizes the UDP port number that the Syslog function marks messages to the logging server package with (range: 1 - 65535, default: **514**).

set system syslog facility [local0 ... local7]

Specifies the local facility number that Syslog messages are sent to (range: local0 - local7, default: **local0**).

set system syslog level [0 ... 7]

Sets the severity level of Syslog messages the NVG599 will send to the Syslog server. Each severity level includes all higher-level messages (e.g; a level of 2 [Critical] will also send Alert and Emergency messages). The severity levels are arranged and enumerated as follows:

- ◆ 0 : Emergency
 - ◆ 1 : Alert
 - ◆ 2 : Critical
 - ◆ 3 : Error
 - ◆ 4 : Warning
 - ◆ 5 : Notice (default)
 - ◆ 6 : Info
 - ◆ 7 : Debug
-

set system syslog log-system [on | off]

Enables or disables the generation of system log messages for the Syslog server. If the Syslog function is enabled, system log is enabled (on) by default.

set system syslog log-firewall [on | off]

Enables or disables the delivery of firewall log messages to the Syslog server. Firewall log is disabled by default.

set system syslog log-igmp [on | off]

Enables or disables the delivery of IGMP log messages to the Syslog server. The IGMP log is disabled by default.

set system syslog log-voice [on | off]

Enables or disables the generation of voice log messages for the Syslog server. Voice log is disabled by default.

set system voice-check enable [off | on]

When this is set to **on**, and a voice call is in progress when a software update is scheduled, the software update is deferred for the **voice-check interval** until the call is completed, that is, the call state becomes "idle." If set to **off**, and a voice call is in progress when an update is scheduled, the call is torn down. The default is **on**.

set system voice-check interval [60 - 86400]

Specifies the interval in seconds for the device to wait before attempting a software update, when a software update is scheduled but a voice call is in progress, when **voice-check enable** is set to **on**. The default is **300** (5 minutes).

set system voice-check max-time [300 - 604800]

Specifies the maximum time in seconds for the device to continue to attempt a scheduled software update if a voice call is in progress and **voice-check enable** is set to **on**. The default is **3600** (1 hour).

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 NVG599 device 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 consists of the name of the NVG599 device followed by the word "DEBUG" and a right angle bracket (>). For example, if you open a CLI connection to the NVG599 named "ARRIS-3000/9437188" and then type **debug** you would see **ARRIS-3000/9437188/DEBUG>** as your prompt.

Debug level is available for field debugging purposes. There is no service and quality level guarantee from ARRIS. This level is intended for SEs or Telco lab personnel, not for normal operation at home for end users.

More commands are available. To display the options, type **help all**.

Disclaimer and 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

Makes this session the console.

mirror <src-port> <dst-port>

Mirrors 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.

show fastpath

Displays entries in fastpath.

show cpu

Displays CPU usage as a percentage and CPU load averages over 1, 5, and 15 minute periods.

TR-069 CLI CShell Commands (debug mode)

```
tr69 GetParameterValues <path>
tr69 SetParameterValues <path> = <value>
tr69 GetParameterNames <path> <nextlevel>
tr69 Addobject <path>
tr69 Deleteobject <path>
```

Example:

```
tr69 GetParameterValues InternetGatewayDevice.
```



NOTE:

CLI and ACS sessions are mutually exclusive and should not be used at the same time

CHAPTER 5 Technical Specifications and Safety Information

Description

Dimensions:

10 in H x 7.25 in L x 1.63 in W (25.4 cm H x 18.4 cm L x 4.1 cm W)

1.28 lbs (.58 kg) (without integrated battery)

1.77 lbs (.80 kg) (with integrated battery)

Communications interfaces: The ARRIS Gateways have a 4-port 10/100/1000Base-T Ethernet switch for your LAN connections, an FXS port for VoIP connections, a HomePNA 3.1 coax port, a USB 2.0 network port, and a 400 mW wireless radio for Wi-Fi connections.

WAN interfaces: Bonded VDSL2/single line VDSL2/bonded ADSL2+/single line ADSL, RJ-14; One-port 10/100/1000 Ethernet, RJ-45

Power Supply

115VAC 36W/12VDC@3A (2phone,5REN, RINGING)

Environment

Operating temperature: 0°C to 42°C (32° F to 107° F); 8% to 95% (Non Condensing) Relative Humidity

Storage temperature: -20° C to 85° C (-4° F to 185° F)

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: IPv4 , IPv6/6rd; DHCP server/relay; DNS Proxy, Dynamic DNS Support; Multiple subnet support

WAN support: PPPoA, DHCP, static IP address; ADSL, ADSL2/2+, ADSL2 Reach Extended protocol (ITU G.992.3 annex L)

Security: Stateful Packet Inspection Firewall; Virtual DMZ/IP pass-through; Denial of Service (DoS) protection; VPN Pass-through (PPTP, L2TP, IPSec)

Wi-Fi Security. WEP (64-bit, 128-bit, 256-bit) encryption 802.1x, WPA, WPA-PSK, 802.11i/WPA2, WPA2-PSK EAP-TLS, EAP-TTLS, EAP-SIM MAC Address filtering

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

Integrated Battery:

- ◆ Hazardous Materials Regulations and Procedures CFR Title 49, Section 173, Subsection 185
- ◆ UL60950/CAN/CSA-C22.2 No. 60950—Recognized component (U.S. and Canada)
- ◆ UL 2054—Recognized component (U.S. and Canada)
- ◆ UN Manual of test and Criteria, sect. 38.3, CE, IEC62133
- ◆ California Code of Regulation Title 20

Manufacturer's Declaration of Conformance

**WARNING:**

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 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.

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 device.
- ◆ Increase the distance between the equipment being interfered with and the device.
- ◆ Connect the device to an outlet on a circuit different from the outlet to which the equipment being interfered with is connected.
- ◆ Consult the retailer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations within the 5.15 ~ 5.25GHz band are restricted to indoor use only.

Radiation Exposure Statement: This equipment complies with FCC radiation exposure limits as set forth for an uncontrolled environment. This equipment should be installed and operated maintaining a minimum distance of 20cm between the device and your body.

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.arrisi.com/consumer>

**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 Règlement 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-XXXX-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 NVG599 device, 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 NVG599 device, for warranty information, please contact:

Technical Support for Hardware Products
1-877-466-8646
<http://moto.force.com/customer-care360>

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 ARRIS 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 that the installation of this ARRIS NVG599 VDSL2 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 NVG599 device 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 arrester or similar protection device.

Caring for the Environment by Recycling

When you see this symbol on an ARRIS product, do not dispose of the product with residential or commercial waste.



Recycling your ARRIS 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 ARRIS Customer Service for assistance.

Beskyttelse af miljøet med genbrug

Når du ser dette symbol på et ARRIS-produkt, må produktet ikke bortskaffes sammen med husholdningsaffald eller erhvervsaffald.

Genbrug af dit ARRIS-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 ARRIS Kundeservice.

Umweltschutz durch Recycling

Wenn Sie dieses Zeichen auf einem Produkt von ARRIS sehen, entsorgen Sie das Produkt bitte nicht als gewöhnlichen Hausoder Büromüll.

Recycling bei Geräten von ARRIS

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 ARRIS.

Cuidar el medio ambiente mediante el reciclaje

Quando vea este símbolo en un producto ARRIS, no lo deseche junto con residuos residenciales o comerciales.

Reciclaje de su equipo ARRIS

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 ARRIS.

Recyclage pour le respect de l'environnement

Lorsque vous voyez ce symbole sur un produit ARRIS, ne le jetez pas avec vos ordures ménagères ou vos rebus d'entreprise.

Recyclage de votre équipement ARRIS

Veillez ne pas jeter ce produit avec vos ordures ménagères ou vos rebus 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 région. Si aucun système de collecte n'est disponible, veuillez appeler le Service clientèle de ARRIS qui vous apportera son assistance.

Milieubewust recycleren

Als u dit symbool op een ARRIS-product ziet, gooi het dan niet bij het huishoudelijk afval of het bedrijfsafval.

Dbá³oEç o Erodowisko - recycling

Produktów ARRIS oznaczonych tym symbolem nie naleŹy wyrzucać do komunalnych pojemników na Êmieci.

Cuidando do meio ambiente através da reciclagem

Quando vocÊ ver este símbolo em um produto ARRIS, não descarte o produto junto com lixo residencial ou comercial.

Var rädd om miljön genom återvinning

När du ser den här symbolen på en av ARRIS produkter ska du inte kasta produkten tillsammans med det vanliga avfallet.

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c-ares async resolver library

<http://daniel.haxx.se/projects/c-ares/>

Original ares library by Greg Hudson, MIT

<ftp://athena-dist.mit.edu/pub/ATHENA/ares>

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dhcpcd - DHCP client daemon 5.5.0

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libtecla 1.6.1

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lua 5.1

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muhttp 1.1.3

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OpenSSL 0.9.8k

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pcre 5.0

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Updated to ppp-2.4.1 by Bernhard Kaindl

Updated to ppp-2.4.2 by David Woodhouse 2004.

- disconnect method added

- remove_options() abuse removed.

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Appendix A ARRIS Gateway Captive Portal Implementation

This section contains information about the ARRIS Gateway Captive Portal Support.

Overview

ARRIS 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. A White-IP address list can be configured to avoid the captive portal redirect. All HTTP traffic destined to the IP addresses within this white IP address list will not be redirected to the Captive Portal. Any Changes to the Captive Portal parameters will take place immediately and do not require a reboot.

- ◆ PortalURL can be a maximum of 512 characters long.
- ◆ A maximum of 500 White-IP addresses are supported. The White-IP address list takes a comma-separated string, which can be Individual IP addresses or a range of IP addresses. For a range of IP addresses, a 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
- ◆ The 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**
- ◆ The 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 the NVG599, 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>
```

Appendix B Quality of Service (QoS) Examples

This section contains information about the ARRIS Gateway QoS implementation.

Overview

When packets arrive on a high speed interface and are forwarded to a low speed interface, there is contention for bandwidth. This is the use case for QoS: to make effective use of bandwidth.

The basic steps for Quality of Service are to match and identify packets as belonging to a class of traffic, and to give each class of traffic a certain behavior such as priority queuing or bandwidth shaping across critical networking bottlenecks.

Packets forwarded through the system are classified using sets of filter rules to match various criteria, for example p-bit, DSCP, IP address, port, etc. The matching rule can set the classification, which is the name of the queue that is to be used.

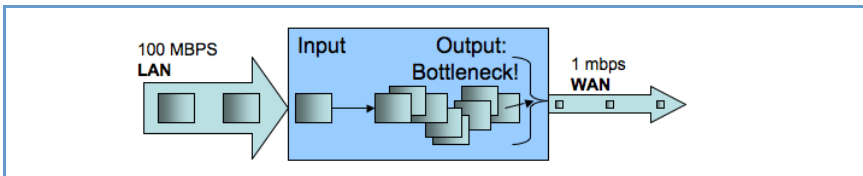


Figure 1. Illustration of upstream congestion, all traffic is consistently delayed.

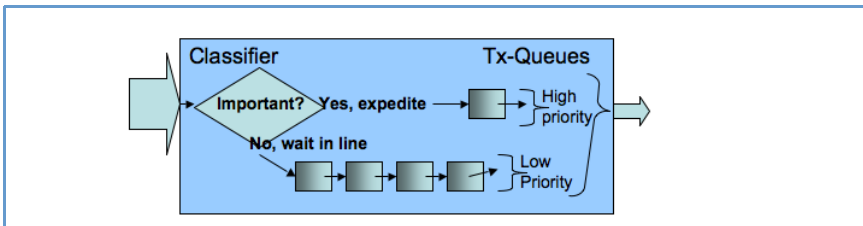


Figure 2. Illustration of classification and transmit queue in a simple high/low priority scheme. Low priority may transmit only when high priority is completely empty.

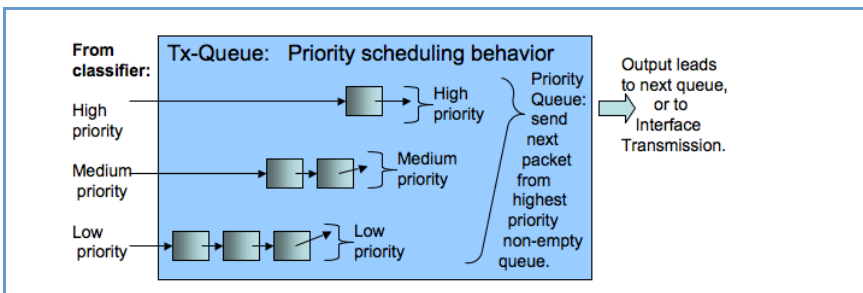


Figure 3. Illustration of priority scheduling

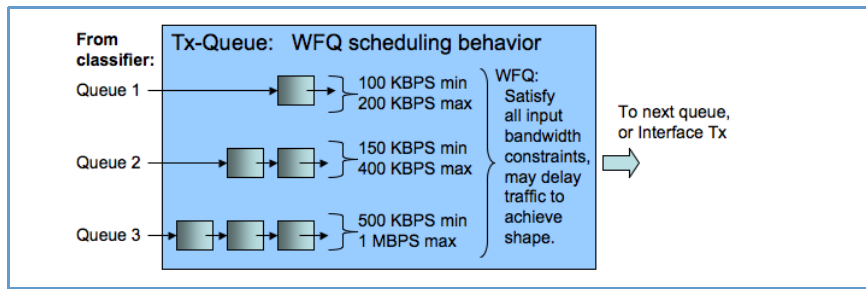


Figure 4. Illustration of weighted fair queue scheduling

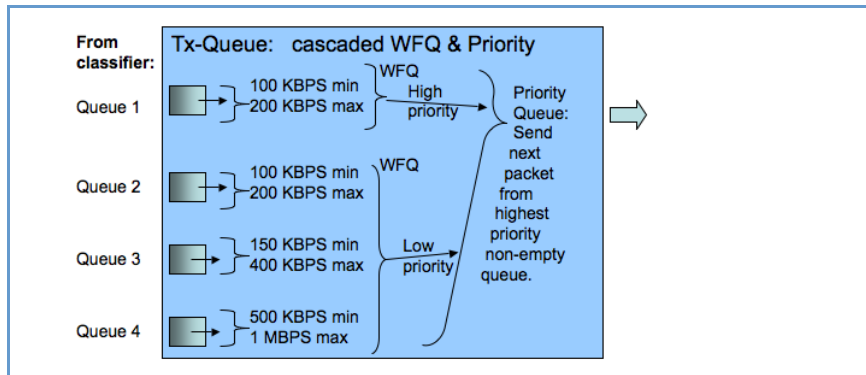


Figure 5. Illustration of a hybrid queue that is both priority and WFQ, to both constrain bandwidth usage and expedite one of the queues.

After the packet has been classified, it can be put in the proper queue. Queues are assigned to interfaces and can be constructed of several queue components to deliver the desired behavior. The components of an interface queue are these building blocks:

- ◆ **basic queues:** a 1 input 1 output packet list with a length of 64 packets by default. Packets will tail-drop when the enqueued to a full basic queue.
- ◆ **priority queue:** 2 or more input, 1 output. Schedules the packets from the various inputs strictly according to input's priority.
- ◆ **weighted fair queue:** 1 or more input, 1 output. Schedules the packets according to bandwidth constraints

Packets are enqueued to basic queues, and only to basic queues. Basic queues are output to priority queues and weighted fair queues, which act as “plumbing” elements that alter the dequeuing order and rate, respectively. Priority queues and weighted fair queues can contain one another.

Weighted fair queues are used to constrain bandwidth. For example, consider a weighted fair queue with three basic queues as inputs, EF, AF and BE:

```

WFQ
Input 1: EF
Input 2: AF
Input 3: BE

```

Each input entry is configured with a weight value, which is the rate at which to limit the traffic. This weight can be either absolute (bps) or a relative percentage of the interface's data-rate. This allows dedicating a split amount of bandwidth to each queue. A special value for the weight parameter is zero, which will use the remainder of unclaimed bandwidth.

There is an option to enable bandwidth sharing, so that unused bandwidth in idle queues can be shared to other queues. When the traffic resumes in the previously idle queue, the previously shared-out bandwidth is taken back.

When bandwidth sharing is enabled, a secondary rate configuration appears on each input entry, the peak parameter. This is a hard limit on the amount of bandwidth that the particular input entry can use. This rate will not be exceeded, even if there is an excess pool of idle bandwidth that could otherwise be shared.

Upstream QoS: Priority and Shaping

The gateway uses the DSL sync rate to determine traffic shaping requirements for WAN traffic. In this case there are 6 basic queues, and a hierarchy of both priority queue and weighted fair queue (WFQ) with bandwidth sharing and dual rate shaping. First the packets are classified via the filterset, to set the QoS-marker with the name of the desired basic queues. The queues are shown here, with packets traveling from left to right. Each basic queue feeds into a WFQ entry, and is shaped between the minimum bandwidth defined by **weight**, and the maximum rate defined by **peak**. If there is sufficient bandwidth, the WFQ entry shapes at the **peak** rate. If there is no spare bandwidth available for sharing, then the queue is shaped at the **weight** rate. The **weight** rate is defined either as a bps value, or as a percentage of line-rate that is determined once the upstream WAN data-rate is acquired. This **weight** value behaves as a committed information rate (CIR), and the **peak** value behaves as a peak information rate (PIR.)

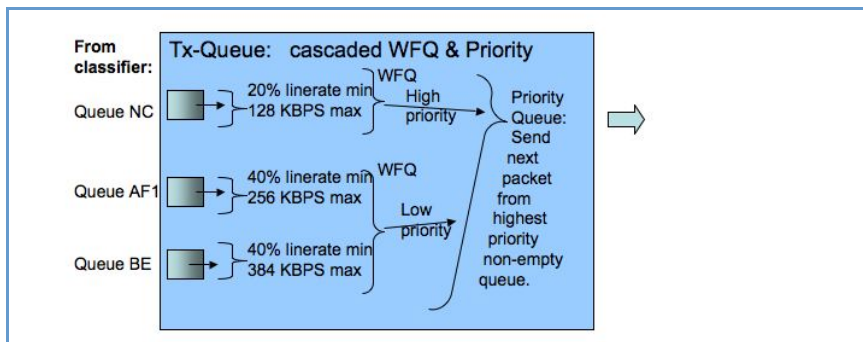


Figure 6. Illustration of default queues used for AT&T

Packet Rx > Filterset Rules:

Match Rule 1? Set QoS marker = EF
 Match Rule 2? Set QoS marker = AF1
 Match Rule 3? Set QoS marker = BE

```
EF CIR/PIR -> wfq_hi -> PQ1 \  
AF4 CIR/PIR \  
AF3 CIR/PIR \  
AF2 CIR/PIR > wfq_lo > PQ2 /  
AF1 CIR/PIR /  
BE CIR/PIR /  
 > PQ output to interface Tx
```

Downstream QoS: Ethernet Switch

The simplest way of handling downstream QoS (from WAN to LAN) is to use the per-port queues that are present in the Ethernet switch. This achieves the greatest efficiency since the queues are handled in the switch hardware, and should be used when a strict priority queue with 4 priorities is sufficient.

The traffic is classified by priority-bit value. This can be the value retained from WAN ingress (assuming WAN is tagged,) or it can be a value that is set via a filter rule, which allows for advanced classification criteria to be used. Even though the LAN interface might not be tagged, there is still an internal priority field which is used to convey this information to the switch.

Downstream QoS: Egress queues

The secondary method of downstream QoS is to assign egress queues to the LAN port configuration. This is less efficient, however it allows more advanced queue scheduling algorithms to be used. Packets are classified by QoS markers set by filter rules.



NOTE:

This method is typically not recommended for deployment configuration as this mechanism can consume a large amount of CPU processing bandwidth.

Index

Symbols

!! command [106](#)

A

Access Code [30](#)

Address resolution table [113](#)

Administrator password [105](#)

Arguments, CLI [118](#)

ARP

Command [107](#), [116](#)

B

basic queues [219](#)

Broadband Network Redirect [22](#)

Broadband Status [34](#)

Broadband Status Notification [86](#)

C

Call Statistics [55](#)

Captive Portal [213](#)

CLI [101](#)

!! command [106](#)

Arguments [118](#)

Command shortcuts [106](#)

Command truncation [118](#)

Configuration mode [118](#)

Keywords [118](#)

Navigating [118](#)

Prompt [106](#), [118](#)

Restart command [106](#)

SHELL mode [106](#)

View command [119](#)

Command

ARP [107](#), [116](#)

Ping [108](#)

Telnet [115](#)

Command line interface (see CLI)

CONFIG

Command List [104](#)

Configuration mode [118](#)

Connection commands [121](#)

Custom Service [69](#)

D

Default Server [75](#)

designing a new filter set [61](#)

Detect Missing Filter [79](#)

Device Access Code [24](#)

Device List [28](#)

DHCP lease table [109](#)

Diagnostic log [109](#), [114](#)

Diagnostics [78](#)

Documentation conventions [8](#)

Downstream QoS [221](#)

E

Ethernet statistics [109](#)

Event Notifications [86](#)

F

filter

parts [61](#)

parts of [61](#)

filter sets

using [62](#)

filters

using [61](#), [62](#)

firewall [113](#)

Firewall Advanced [76](#)

Firewall Status [59](#)

G

Global Filterset [128](#)

H

Help [27](#)

Home Network [39](#)

HPNA [51](#)

HPNA Configure [42](#)

I

ICMP Echo [108](#)
IGMP [139](#)
IGMP Snooping [140](#)
IGMP Stats [38](#)
IP DNS commands [139](#)
IP Gateway commands [132](#)
IP IGMP commands [139](#)
IP interfaces [113](#)
IP Passthrough [73](#)
IP routes [113](#)
IPMap table [113](#)

K

Keywords, CLI [118](#)

L

LAN Ethernet Statistics [41](#)
LAN Host Discovery Table [113](#)
LEDs [13](#)
Link commands [143](#)
links bar [27](#)
Log [114](#)
Logging in [105](#)
Logs [81](#)

M

MAC Filtering [46](#)
Management commands [146](#)
Memory [114](#)
Missing Filter Notification [86](#)

N

NAT Pinhole commands [157](#)
NAT Table [86](#)
NAT/Gaming [67](#)
NSLookup [79](#)
NTP commands [142](#)

P

Packet Filters [60](#)
Password
 Administrator [105](#)
 User [105](#)
Physical interfaces commands [150](#)
Ping [79](#)
Ping command [108](#)
PPP [117](#)
priority queue [219](#)
Prompt, CLI [106](#), [118](#)

Q

QoS [217](#)
Quality of Service [217](#)

R

Redirect page [23](#), [149](#)
Reset Connection [84](#)
Reset Device [84](#)
Reset IP [84](#)
Resets [84](#)
Restart [84](#), [110](#)
Restart command [106](#)
Restart Modem [33](#)

S

Safety Instructions [12](#)
Security
 filters [60](#)
Session Initiation Protocol [160](#)
SHELL
 Command Shortcuts [106](#)
 Commands [106](#)
 Prompt [106](#)
SHELL level [118](#)
SHELL mode [106](#)
show config [110](#)
Show ppp [117](#)
SIP [160](#)
Step mode [119](#)
Subnets & DHCP [47](#)
Supported Games and Software [71](#)
Syslog [85](#)
System commands [173](#)
System Information [29](#)

T

tab bar [27](#)
Targeted Ad Insertion [171](#)
Telnet [105](#)
Telnet command [115](#)
Test Web Access [79](#)
TFTP server [108](#)
Traceroute [79](#)
Trivial File Transfer Protocol [107](#)
Troubleshoot [78](#)
Truncation [118](#)

U

Update [83](#)
Upstream QoS [220](#)
User name [105](#)
User password [105](#)

V

View command [119](#)
view config [115](#)
Voice [53](#)
Voice-over-IP [160](#)
VoIP [160](#)

W

weighted fair queue [219](#)
WiFi-Key [45](#)
Wireless [43](#)
Wireless Security [45](#)



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