SMART/RG
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/ Gateway User Manual

Model: SR501

Release 1.3

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Firmware Version 2.6.2.4

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Welcome!

Thank you for purchasing this SmartRG product.

SmartRG offers solutions that simplify the complex Internet ecosystem. Our solutions include hardware, software, applications, enhanced network insights, and security delivered via a future-proof operating system. Based in the USA, SmartRG provides local, proactive software development and customer support. We proudly offer the best, most innovative broadband gateways available.

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Purpose & Scope

This User Manual provides SmartRG customers with installation, configuration and monitoring information for the SR501 gateway.

Intended Audience

The information in this document is intended for Network Architects, NOC Administrators, Field Service Technicians and other networking professionals responsible for deploying and managing broadband access networks. Readers of this manual are assumed to have a basic understanding of computer operating systems, networking concepts and telecommunications.

Getting Assistance

Frequently asked questions are provided at the bottom of the Subscribers page of the SmartRG Web site.

Subscribers: If you require further help with this product, please contact your service provider.

Service providers: if you require further help with this product, please open a support request.

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Getting Familiar with your Gateway

This section contains descriptions of the SR501 gateway's lights, ports, and buttons.

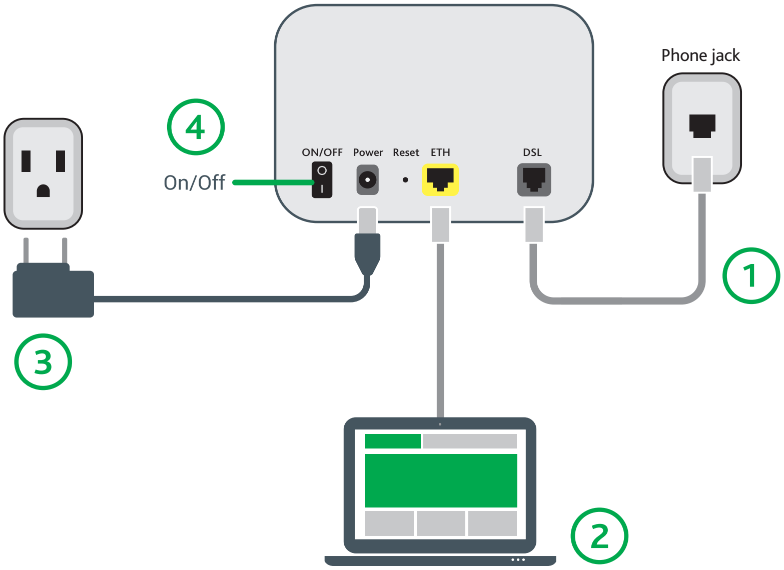
LED Status Indicators

Your SR501 gateway has four indicator lights (LEDs) on the front. The following table describes the LEDs and their functions.

LED	Action	Description
Internet	🟢	Connected to Internet
	🔴	Authentication failed.
DSL	✹	Connecting to DSL
	🟢	Connected to DSL
	✹	Transferring data
LAN	🟢	Connected to LAN
	✹	Transferring data
POWER	🟢	Unit is on

Connections

Below is a diagram of how to install your SR501 gateway. This information is also in the Quick Start Guide enclosed with your gateway.



The ports depicted in this example are described below.

Port	Description
Power	Connect the power cord included with your gateway to this connector. Use only the power supply included with your gateway. Intended for indoor use only.
ETH	The yellow RJ45 port on the back of your gateway is used to connect client devices such as computers and printers to your gateway
DSL	The grey RJ12 port labeled DSL is specifically intended for connection to an internet provider via a DSL (Digital Subscriber Line) service.

Buttons

ON/OFF Switch

The ON/OFF toggle switch is located on the back of the gateway and turns the gateway on and off.

Reset Button

The Reset button is a small hole in the gateway's enclosure with the actual button mounted behind the surface. This style of pushbutton prevents the gateway from being inadvertently reset during handling. Reset must be actuated with a paper clip or similar implement.

The Reset button is located on the back of the unit.

This pin-hole sized reset button has three functions. The duration for which the button is held dictates which function is carried out.

Hold Duration	Effect
Less than 6 seconds	Performs a modem reset that is equivalent to the **Reboot** function in the gateway software.
6-20 seconds	Performs the software equivalent to the **Restore Defaults** function in the gateway software.
20 or more seconds	Changes the POWER LED to red and the gateway enters CFE mode which is a state associated with performing firmware updates via Internet browser.

Installing your SmartRG Gateway

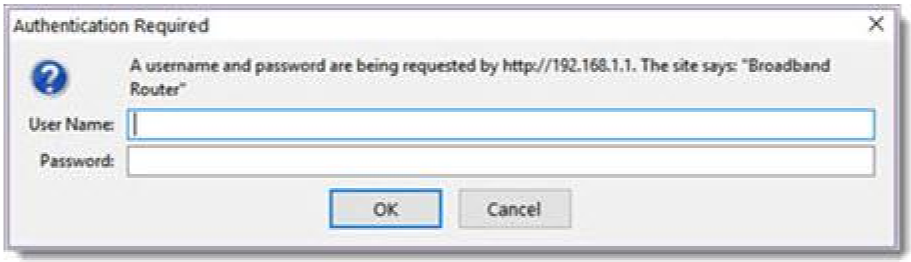
The following instructions explain all connection types offered for SmartRG gateways. For instructions specific to your gateway, follow the instructions in the Quick Start Guide included in the box.

1. Attach your computer's RJ45 connection to the SmartRG gateway's LAN port.
2. If your computer is not already set up to acquire IP addresses using DHCP, configure your computer's IP interface to do so. (For instructions on logging in to a SmartRG gateway configured for "bridge mode" operation, see the Note below.)

Logging in to your SmartRG Gateway's UI

To manually configure the SmartRG Gateway, you can access the gateway's embedded web UI.

1. Open a browser and enter the gateway's default address: http://192.168.1.1 in the address bar. The Authentication Required dialog box appears.



Authentication Required

A username and password are being requested by http://192.168.1.1. The site says: "Broadband Router"

User Name:

Password:

2. Enter the default username and password: admin/admin, and click **OK**. The Device Info summary page appears.

Note: The gateway's UI can be accessed via the WAN connection by entering the WAN IP address in your browser's address bar and entering the default username and password: support/support. WAN HTTP access control MUST be enabled to access the gateway's UI via the WAN connection. For more information, see the Management Access Control section.

If your SmartRG gateway is configured for "bridge mode" (modem) operation, your PC will NOT be able to acquire an address via CPE DHCP. Instead, manually configure your PC's interface with an IP address on the default network (e.g., 192.168.1.100).

The remainder of this guide is dedicated to a sequential walk-through of the gateway user interface. Screen captures are provided along with descriptions of the options available on the pictured page. Where applicable, valid values are provided.

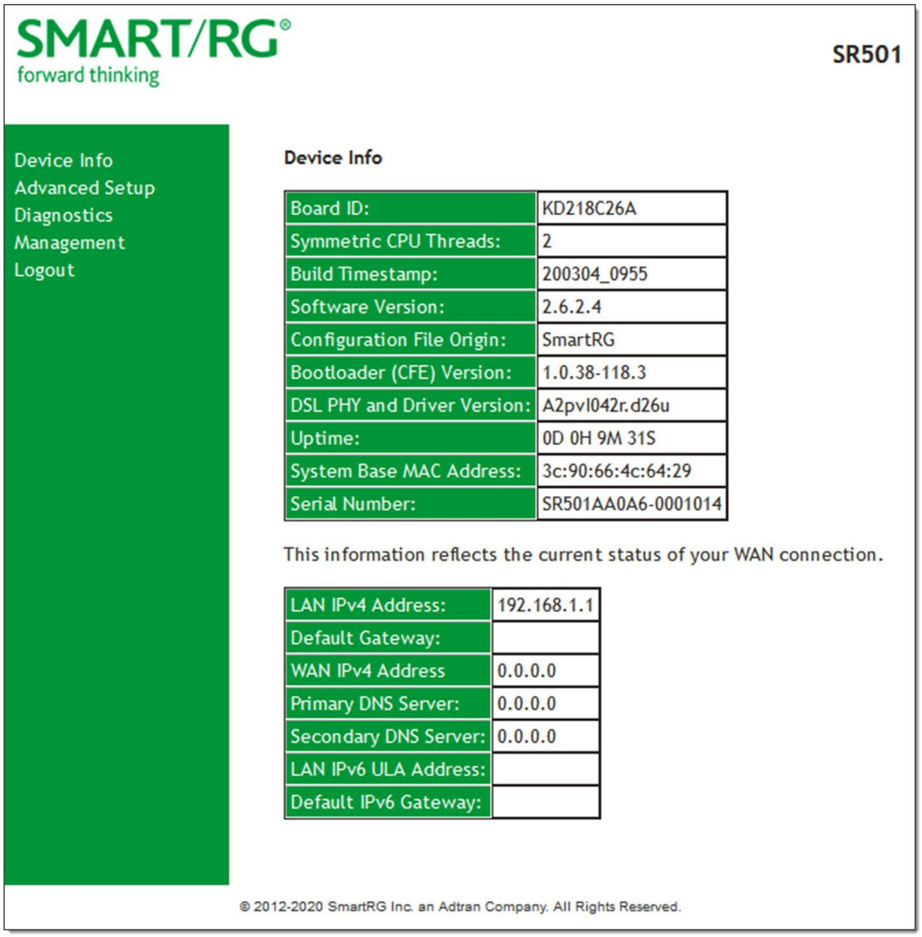
For in-depth "how-to" information for specific scenarios, look at the knowledge base found on our support web site. Access to this site is restricted to SmartRG customers and partners. Do not share links to this site with your subscribers.

Device Info

In this section, you can view information about your gateway's setup, status or nature of its connection with the provider and with LAN devices. You cannot change the settings in this section.

Summary

When you log into the gateway interface, the **Device Info** summary page appears. This page displays details about the hardware and software associated with your gateway. In addition, the current status of the WAN connection (if present) is shown.



Device Info

Board ID:	KD218C26A
Symmetric CPU Threads:	2
Build Timestamp:	200304_0955
Software Version:	2.6.2.4
Configuration File Origin:	SmartRG
Bootloader (CFE) Version:	1.0.38-118.3
DSL PHY and Driver Version:	A2pvl042r.d26u
Uptime:	0D 0H 9M 31S
System Base MAC Address:	3c:90:66:4c:64:29
Serial Number:	SR501AA0A6-0001014

This information reflects the current status of your WAN connection.

LAN IPv4 Address:	192.168.1.1
Default Gateway:	
WAN IPv4 Address	0.0.0.0
Primary DNS Server:	0.0.0.0
Secondary DNS Server:	0.0.0.0
LAN IPv6 ULA Address:	
Default IPv6 Gateway:	

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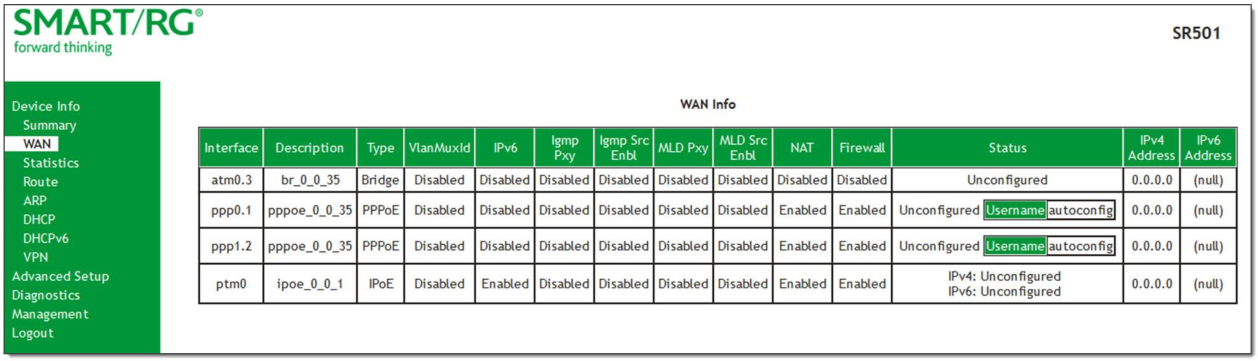
WAN

On this page, you can view information about the connection between your ISP and your gateway. The WAN interface can be DSL or Ethernet and supports a number of Layer 2 and above configuration options (explained later in this document).

In the left navigation bar, click **Device Info** > **WAN**. The following page appears.



WAN Info

Interface	Description	Type	VlanMuxId	IPv6	Igmp Pxy	Igmp Src Enbl	MLD Pxy	MLD Src Enbl	NAT	Firewall	Status	IPv4 Address	IPv6 Address
atm0.3	br_0_0_35	Bridge	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Unconfigured	0.0.0.0	(null)
ppp0.1	pppoe_0_0_35	PPPoE	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Enabled	Enabled	Unconfigured Username autoconfig	0.0.0.0	(null)
ppp1.2	pppoe_0_0_35	PPPoE	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Enabled	Enabled	Unconfigured Username autoconfig	0.0.0.0	(null)
ptm0	ipoe_0_0_1	IPoE	Disabled	Enabled	Disabled	Disabled	Disabled	Disabled	Enabled	Enabled	IPv4: Unconfigured IPv6: Unconfigured	0.0.0.0	(null)

The fields on this page are explained in the following table.

Field Name	Description
Interface	The connection interface (Layer 2 interface) through which the gateway handles the traffic.
Description	The service description such ipoe_0_0_1, showing the type of WAN and its ID.
Type	The service type. Options are **PPPoE**, **IPoE**, and **Bridge**.
VlanMuxId	The VLAN ID. Options are **Disabled** or **0-4094**.
IPv6	The state of IPv6. Options are **Enabled** and **Disabled**.
Igmp Pxy	The IGMP proxy.
Igmp Src Enbl	The IGMP source option is enabled for this connection.
MLD Pxy	The MLD proxy.
MLD Src Enbl	The MLD source option is enabled for this connection.
NAT	The state of NAT. Options are **Enabled** and **Disabled**.
Firewall	The state of the Firewall. Options are **Enabled** and **Disabled**.
Status	The status of the WAN connection(s). Options are **Disconnected**, **Unconfigured**, **Connecting**, and **Connected**.

Field Name	Description
IPv4 Address	The obtained IPv4 address.
IPv6 Address	The obtained IPv6 address.

Statistics

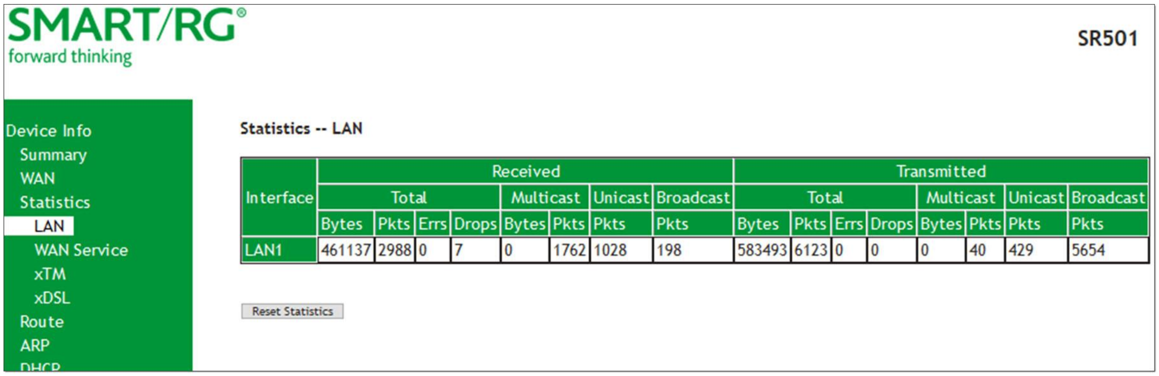
In this section, you can view network interface information for LAN, WAN Service, xTM and xDSL. All data is updated in 15-minute intervals.

LAN

On this page, you can view the received and transmitted bytes, packets, errors and drops for each LAN interface configured on your gateway. Data is provided for the total bytes, packets, errors and drops as well as bytes and packets for multicast transmissions, and packets for unicast and broadcast transmission. All local LAN Ethernet ports, Ethernet WAN ports and w10 (Wireless Interface) are included.

In the left navigation bar, click **Device Info** > **Statistics**. The Statistics - LAN page appears where you can view detailed information about the status of your LAN.

To reset the counters, click **Reset Statistics** near the bottom of the page.



Statistics -- LAN

Interface	Received								Transmitted							
	Total				Multicast		Unicast	Broadcast	Total				Multicast		Unicast	Broadcast
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts
LAN1	461137	2988	0	7	0	1762	1028	198	583493	6123	0	0	0	40	429	5654

The fields on this page are explained in the following table.

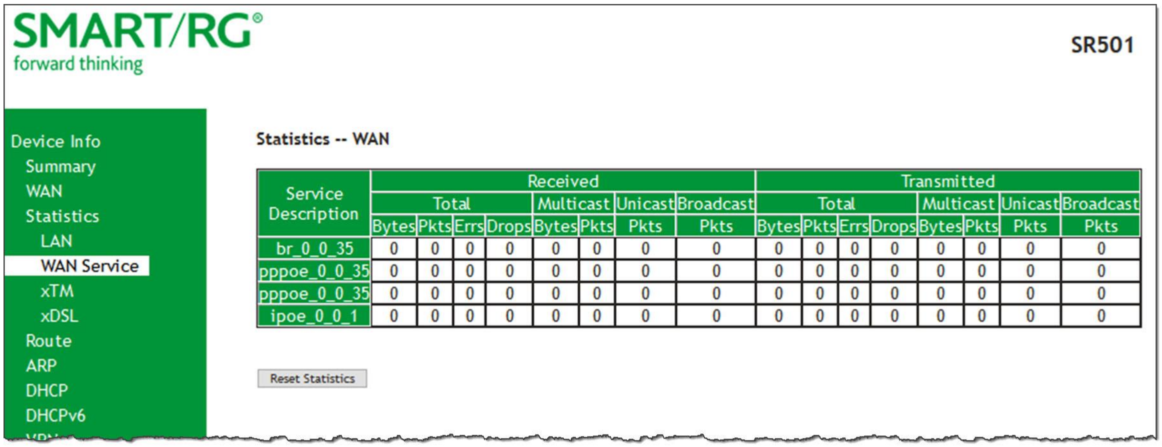
Field Name	Description
Interface	LAN interface.
Received & **Transmitted** columns	
Bytes	Number of packets in bytes.
Pkts	Number of packets.
Errs	Number of error packets.
Drops	Number of dropped packets.

WAN Service

On this page, you can view the received and transmitted bytes, packets, errors and drops for each WAN interface for your SmartRG Gateway. Data is provided for the total bytes, packets, errors and drops as well as bytes and packets for multicast transmissions, and packets for unicast and broadcast transmission. All WAN interfaces configured for your gateway are included.

In the left navigation bar, click Device Info > Statistics > WAN Service. The Statistics - WAN page appears where you can view detailed information about the status of your WAN.

To reset the counters, click Reset Statistics near the bottom of the page.



Statistics -- WAN

Service Description	Received								Transmitted							
	Total				Multicast		Unicast	Broadcast	Total				Multicast		Unicast	Broadcast
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts
br_0_0_35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pppoe_0_0_35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pppoe_0_0_35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ipoe_0_0_1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The fields on this page are explained in the following table.

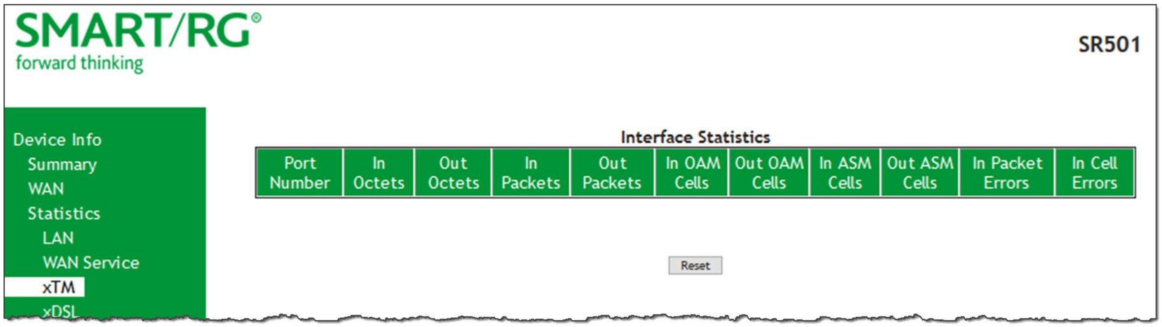
Field Name	Description
Interface	Available WAN interfaces. Options are: **atm**, **ptm**, and **eth**.
Description	Service description. Options are: **pppoe**, **ipoe**, and **bridge**.
Received & Transmitted columns	
Bytes	Number of packets in bytes.
Pkts	Number of packets.
Errs	Number of error packets.
Drops	Number of dropped packets.

xTM

On this page, you can view the ATM/PTM statistics for your gateway. All WAN interfaces configured for your SmartRG gateway are included.

In the left navigation bar, click Device Info > Statistics > xTM. The Interface Statistics page appears.

To reset these counters, click Reset near the bottom of the page.



Interface Statistics

Port Number	In Octets	Out Octets	In Packets	Out Packets	In OAM Cells	Out OAM Cells	In ASM Cells	Out ASM Cells	In Packet Errors	In Cell Errors

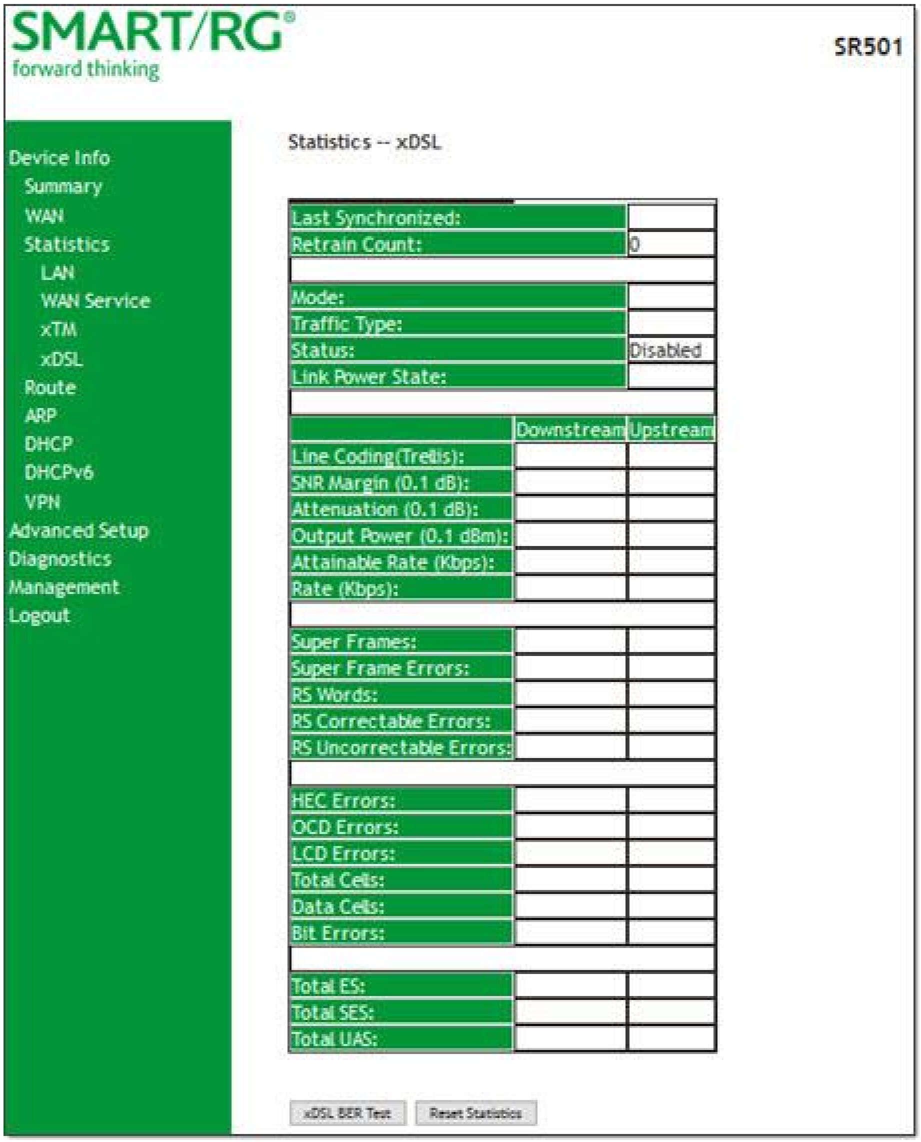
The fields on this page are explained in the following table.

Field Name	Description
Port Number	Statistics for Port 1, or both ports if Bonded.
In Octets	Total quantity of received octets.
Out Octets	Total quantity of transmitted octets.
In Packets	Total quantity of received packets.
Out Packets	Total quantity of transmitted packets.
In OAM Cells	Total quantity of received OAM cells.
Out OAM Cells	Total quantity of transmitted OAM cells.
In ASM Cells	Total quantity of received ASM cells.
Out ASM Cells	Total quantity of transmitted ASM cells.
In Packet Errors	Total quantity of received packet errors.
In Cell Errors	Total quantity of received cell errors.

xDSL

On this page, you can view the DSL statistics for your gateway. All xDSL (VDSL or ADSL) interfaces configured for your SmartRG gateway are included. The terms and their explanations are derived from the relevant ITU-T standards and referenced accordingly.

1. In the left navigation bar, click **Device Info** > **Statistics** > **xDSL**. The Statistics - xDSL page appears.

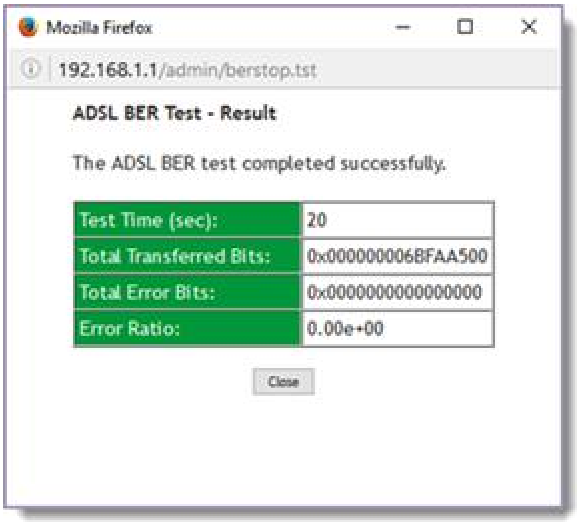


Statistics -- xDSL

Last Synchronized:		
Retrain Count:	0	
Mode:		
Traffic Type:		
Status:	Disabled	
Link Power State:		
	Downstream	Upstream
Line Coding(Trellis):		
SNR Margin (0.1 dB):		
Attenuation (0.1 dB):		
Output Power (0.1 dBm):		
Attainable Rate (Kbps):		
Rate (Kbps):		
Super Frames:		
Super Frame Errors:		
RS Words:		
RS Correctable Errors:		
RS Uncorrectable Errors:		
HEC Errors:		
OCD Errors:		
LCD Errors:		
Total Cells:		
Data Cells:		
Bit Errors:		
Total ES:		
Total SES:		
Total UAS:		

2. To run an xDSL Bit Error Rate (BER) test which determines the quality of the xDSL connection:
   a. Scroll to the bottom of the page and click **xDSL BER Test**. The ADSL BER Test dialog box appears.
   b. In the **Tested Time** field, select the duration in seconds and click **Start**. Options range from **1** second to **360** seconds. The default is **20** seconds.
   The test transfers idle cells containing a known pattern and compares the received data with this known pattern.

Comparison errors are tabulated and displayed in the dialog box.



ADSL BER Test - Result

The ADSL BER test completed successfully.

Test Time (sec):	20
Total Transferred Bits:	0x000000006BFAA500
Total Error Bits:	0x0000000000000000
Error Ratio:	0.00e+00

3. To reset the counters, click Reset Statistics at the bottom of the page.

The fields on this page are explained in the following table.

Field Name	Description
Last Synchronized	The date and time that the gateway was last synchronized.
Retrain Count	The number of times the gateway was synchronized
Mode	xDSL mode that the modem has trained under, such as ADSL2+, G.DMT, etc.
Traffic Type	Connection type. Options are: **ATM** and **PTM**.
Status	Status of the connection. Options are: **Up**, **Disabled**, **NoSignal**, and **Initializing**.
Link Power State	Current link power management state (e.g., L0, L2, L3).
Downstream and Upstream columns	
Line Coding (Trellis)	State of theTrellis Coded Modulation. Options are **On** and **Off**.
SNR Margin (dB)	The signal-to-noise ration margin (SNRM) is the maximum increase (in dB) of the received noise power, such that the modem can still meet all of the target BERs over all the frame bearers. [2]
Attenuation (dB)	The signal attenuation is defined as the difference in dB between the power received at the near-end and that transmitted from the far-end. [2]
Output Power (dBm)	Transmission power from the gateway to the DSL loop relative to one Milliwat (dBm).
Attainable Rate (Kbps)	The typically obtainable sync rate, i.e., the attainable net data rate that the receive PMS-TC and PMD functions are designed to support under the following conditions: • Single frame bearer and single latency operation • Signal-to-Noise Ratio Margin (SNRM) to be equal or above the SNR Target Margin • BER not to exceed the highest BER configured for one (or more) latency paths • Latency not to exceed the highest latency configured for one (or more) latency paths

Field Name	Description
	• Accounting for all coding gains available (e.g., trellis coding, RS FEC) with latency bound • Accounting for the loop characteristics at the instant of measurement [2]
Output Power (0.1 Bm)	Transmit power from the gateway to the DSL loop relative to one Milliwatt (dBm).
Attainable Rate (Kbps)	The typically obtainable sync rate, i.e., the attainable net data rate that the receive PMS-TC and PMD functions are designed to support under the following conditions: • Single frame bearer and single latency operation • Signal-to-Noise Ratio Margin (SNRM) to be equal or above the SNR Target Margin • BER not to exceed the highest BER configured for one (or more) latency paths • Latency not to exceed the highest latency configured for one (or more) latency paths • Accounting for all coding gains available (e.g., trellis coding, RS FEC) with latency bound • Accounting for the loop characteristics at the instant of measurement [2]
Rate (Kbps)	The current net data rate of the xDSL link. Net data rate is defined as the sum of all frame bearer data rates over all latency paths. [2]
Downstream and **Upstream** columns for DSL-specific fields only	
B (# of bytes in Mux Data Frame)	The nominal number of bytes from frame bearer #n per Mux Data Frame at Reference Point A in the current latency path.
M (# of Mux Data Frames in FEC Data Frame	The number of Mux Data Frames per FEC Data Frame in the current latency path.
T (Mux Data Frames over sync bytes)	The ratio of the number of Mux Data Frames to the number of sync bytes in the current latency path.
R (# of check bytes in FEC Data Frame)	The number of Reed Solomon redundancy bytes per codeword in the current latency path. This is also the number of redundancy bytes per FEC Data Frame in the current latency path.
S (ratio of FEC over PMD Data Frame length)	The ratio of FEC over PMD Data Frame length.
L (# of bits in PMD Data Frame)	The number of bits from the latency path included per PMD.
D (interleaver depth)	The interleaving depth in the current latency path, used to manager error correction.
I (interleaver block size in bytes)	The block sizeused for interleaving data transmissions.
N (RS codeword size)	The size of the Reed-Solomon (RS) codeword used for managing error correction.
Delay (msec)	The PMS-TC delay in milliseconds of the current latency path (or the lowest latency path when running dual-latency paths).
INP (DMT symbol)	The input level for DMT-managed DSL environments.
(End of DSL-specific field group)	
Super Frames	The number of xDSL OH Frames transmitted/received.

Field Name	Description
Super Frame Errors	The number of xDSL OH Frames transmitted/received with errors.
RS Words	The number of Reed-Solomon-based Forward Error Correction (FEC) codewords transmitted/received.
RS Correctable Errors	The number of Reed-Solomon-based FEC codewords received with errors that have been corrected.
RS Uncorrectable Errors	The number of Reed-Solomon-based FEC codewords received with errors that were not correctable.
RS Codewords Received	(*Visible only for gateways connected via DSL*) Total number of Reed-Solomon Codewords received.
RS Codewords Corrected	(*Visible only for gateways connected via DSL*) Total number of Reed-Solomon Codewords corrected.
RS Codewords Uncorrected	(*Visible only for gateways connected via DSL*) Total number of Reed-Solomon Codewords Uncorrected
HEC Errors	A count of ATM HEC errors detected. As per ITU-T G.992.1 and G.992.3, a1-byte HEC is generated for each ATM cell header. Error detection is implemented as defined in ITU-T I.432.1 with the exception that any HEC error shall be considered as a multiple bit error, and therefore, HEC Error Correction is not performed. [1],[2]
OCD Errors	Total number of Out-of-Cell Delineation errors. ATM Cell delineation is the process which allows identification of the cell boundaries. The HEC field is used to achieve cell delineation. [4] An OCD Error is counted when the cell delineation process transitions from the SYNC state to the HUNT state. [2]
LCD Errors	Total number of Loss of Cell Delineation errors. An LCD Error is counted when at least one OCD error is present in each of four consecutive overhead channel periods and SEF (Severely Errored Frame) defect is present. [2]
Total Cells	The total number of cells (OAM and Data cells) transmitted/received.
Data Cells	The total number of data cells transmitted/received.
Bit Errors	The total number of Idle Cell Bit Errors in the ATM Data Path. [3]
Total ES	Total number of Errored Seconds. This parameter is a count of 1-second intervals with one or more CRC-8 anomalies. [4]
Total SES	Total number of Severely Errored Seconds. An SES is declared if, during a 1-second interval, there are 18 or more CRC-8 anomalies in one or more of the received bearer channels, or one or more LOS (Loss of Signal) defects, or one or more SEF (Severely Errored Frame) defects, or one or more LPR (Loss of Power) defects. [4]
Total UAS	Total number of Unavailable Seconds. This parameter is a count of 1-second intervals for which the xDSL line is unavailable. The xDSL line becomes unavailable at the onset of 10 contiguous SESs. These 10 SES's shall be included in the unavailable time. Once unavailable, the xDSL line becomes available at the onset of 10 contiguous seconds with no SESs. These 10 seconds with no SES's shall be excluded from unavailable time. [4]

References

[1] ITU-T Recommendation G.992.1 (1999), Asymmetric digital subscriber line (ADSL) transceivers.

[2] ITU-T Recommendation G.992.3 (2005), Asymmetric digital subscriber line transceivers 2 (ADSL2).

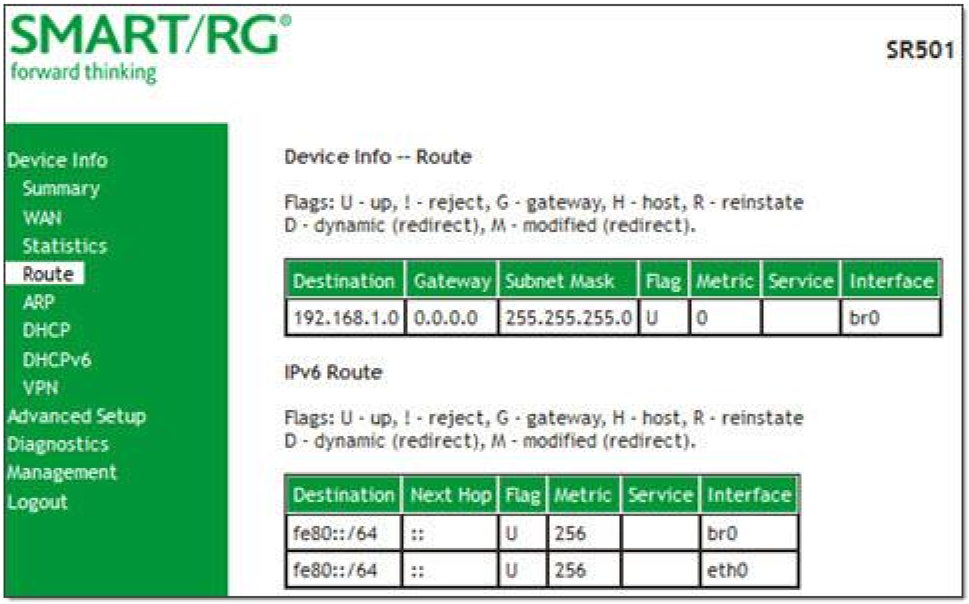
[3] ITU-T Recommendation G.997.1 (2006), Physical layer management for digital subscriber line (DSL) transceivers.

[4] ITU-T Recommendation I.432.1 (1999), B-ISDN user-network interface – Physical layer specification: General characteristics.

Route

On this page, you can view the LAN and WAN route table information configured in your SmartRG Gateway for both IPv4 and IPv6 implementation.

In the left navigation bar, click **Device Info** > **Route**. The following page appears.



Device Info -- Route

Flags: U - up, ! - reject, G - gateway, H - host, R - reinstate
D - dynamic (redirect), M - modified (redirect).

Destination	Gateway	Subnet Mask	Flag	Metric	Service	Interface
192.168.1.0	0.0.0.0	255.255.255.0	U	0		br0

IPv6 Route

Flags: U - up, ! - reject, G - gateway, H - host, R - reinstate
D - dynamic (redirect), M - modified (redirect).

Destination	Next Hop	Flag	Metric	Service	Interface
fe80::/64	::	U	256		br0
fe80::/64	::	U	256		eth0

The fields on this page are explained in the following table.

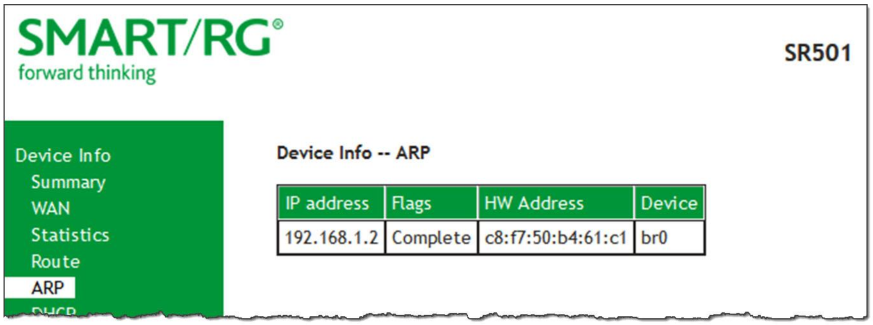
Field Name	Description
Destination	Destination IP addresses.
Gateway	(*For IPv4 only*) Gateway IP address.
Next Hop	(*For IPv6 only*) Next hop IP address.
Subnet Mask	Subnet mask for the gateway.
Flag	Status of the flags. See detailed descriptions above the tables.
Metric	Number of hops required to reach the default gateway.

Field Name	Description
Service	Service type.
Interface	WAN/LAN interface.

ARP

On this page, you can view the host IP addresses and their hardware (MAC) addresses for each LAN Client connected to the gateway via a LAN Ethernet port.

In the left navigation bar, click **Device Info** > **ARP**. The following page appears.



Device Info -- ARP

IP address	Flags	HW Address	Device
192.168.1.2	Complete	c8:f7:50:b4:61:c1	br0

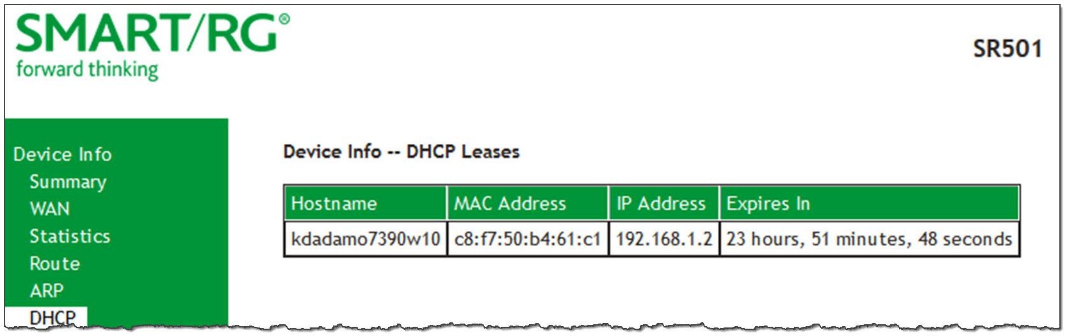
The fields on this page are explained in the following table.

Field Name	Description
IP address	The IP address of the host.
Flags	Each entry in the ARP cache is marked with one of these flags. Options are: **Complete**, **Permanent**, and **Published**.
HW Address	The hardware (MAC) address of the host.
Device	The system level interface by which the host is connected. Options are: **br(n)**, **atm(n)**, and **ptm(n)**.

DHCP

The DHCP page displays a list of locally connected LAN hosts and their DHCP lease status, which are directly connected to the SmartRG Gateway via a LAN Ethernet port.

In the left navigation bar, select **Device Info** > **DHCP**. The following page appears.



Device Info -- DHCP Leases

Hostname	MAC Address	IP Address	Expires In
kdadamo7390w10	c8:f7:50:b4:61:c1	192.168.1.2	23 hours, 51 minutes, 48 seconds

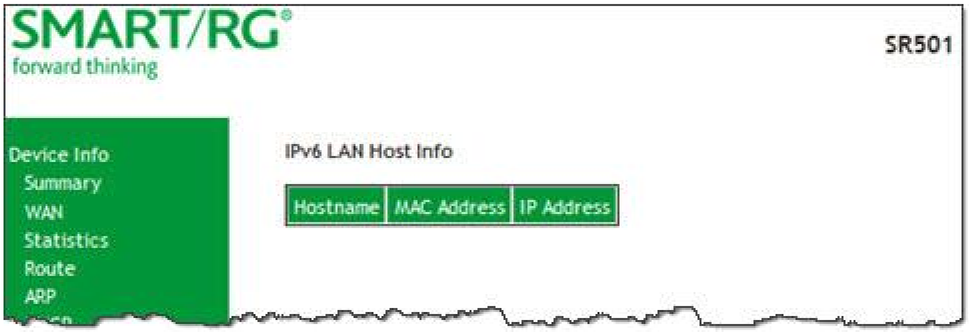
The fields on this page are explained in the following table.

Field Name	Description
Hostname	The host name of each connected LAN device.
MAC Address	The MAC Address for each connected LAN device.
IP Address	The IP Address for each connected LAN device.
Expires In	The time until the DHCP lease expires for each LAN device.

DHCPv6

On this page, you can view the host name, the IP address assigned by the DHCPv6 server, and the MAC address corresponding to the IP address.

In the left navigation bar, select **Device Info** > **DHCPv6**. The following screen appears.



IPv6 LAN Host Info

Hostname	MAC Address	IP Address

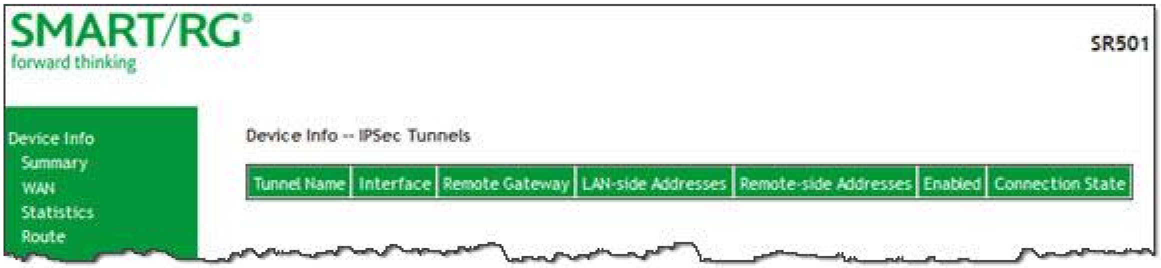
The fields on this page are explained in the following table.

Field Name	Description
Hostname	Host name of each connected LAN device.
MAC Address	MAC address for each connected LAN device.
IP Address	IP address for each connected LAN device.

VPN

On this page, you can view details about the IPSec tunnels configured for your gateway.

In the left navigation bar, select **Device Info** > **VPN**. The following screen appears.



Device Info -- IPSec Tunnels

Tunnel Name	Interface	Remote Gateway	LAN-side Addresses	Remote-side Addresses	Enabled	Connection State

The fields on this page are explained in the following table.

Field Name	Description
Tunnel Name	Name of the IPSec tunnel.
Interface	WAN interface used by the tunnel.
Remote Gateway	WAN IP address for the tunnel.
LAN-side Addresses	Acceptable IP addresses defined for the LAN side.
Remote-side Addresses	Acceptable IP addresses defined for the WAN side.
Enabled	Indicates whether the tunnel is enabled or disabled.
Connection State	Indicates whether the tunnel connection is active or inactive.

Advanced Setup

In this section, you can configure network interfaces, security, quality of service settings, and many other settings for your gateway and network.

Layer2 Interface

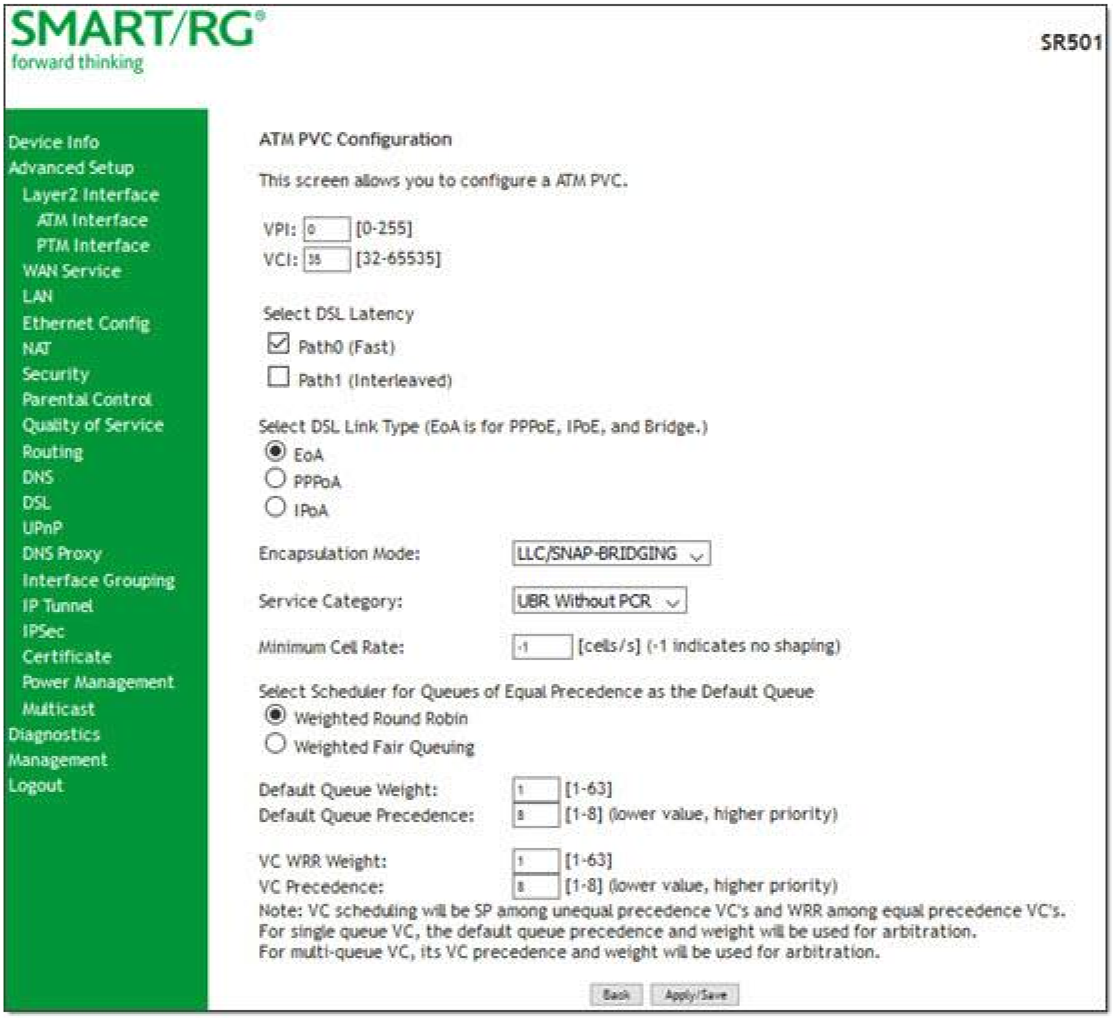
In this section, you can configure interfaces for ATM and PTM interfaces. Generally you can accept the settings configured by default. If your network is highly customized, you may need to modify some of the settings, such as **Username** and **Password**.

ATM Interface

On this page, you can configure Asynchronous Transfer Mode / Permanent Virtual Conduit (ATM/PVC) settings for your gateway. You can customize latency options, link type, encapsulation mode, and more.

Note: Devices (routers) on both ends of the connection must support ATM / PVC.

1. In the left navigation bar, click **Advanced Setup** > **Layer2 Interface** > **ATM Interface** and then click **Add**. The following page appears.



ATM PVC Configuration

This screen allows you to configure a ATM PVC.

VPI: 0 [0-255]
VCI: 35 [32-65535]

Select DSL Latency
☑ Path0 (Fast)
□ Path1 (Interleaved)

Select DSL Link Type (EoA is for PPPoE, IPoE, and Bridge.)
● EoA
○ PPPoA
○ IPoA

Encapsulation Mode: LLC/SNAP-BRIDGING

Service Category: UBR Without PCR

Minimum Cell Rate: -1 [cells/s] (-1 indicates no shaping)

Select Scheduler for Queues of Equal Precedence as the Default Queue
● Weighted Round Robin
○ Weighted Fair Queuing

Default Queue Weight: 1 [1-63]
Default Queue Precedence: 8 [1-8] (lower value, higher priority)

VC WRR Weight: 1 [1-63]
VC Precedence: 8 [1-8] (lower value, higher priority)
Note: VC scheduling will be SP among unequal precedence VC's and WRR among equal precedence VC's.
For single queue VC, the default queue precedence and weight will be used for arbitration.
For multi-queue VC, its VC precedence and weight will be used for arbitration.

2. Modify the settings as desired, using the information provided in the table below.
3. Click Apply/Save to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
VPI	Enter a Virtual Path Identifier. A VPI is an 8-bit identifier that uniquely identifies a network path for ATM cell packets to reach its destination. A unique VPI number is required for each ATM path. This setting works with the VCI. Each individual DSL circuit must have a unique VPI/VCI combination. String limits are: **0-255**.
VCI	Enter a Virtual Channel Identifier. A VCI is a 16-bit identifier that has a unique channel. Options are: **32-65535**.

Field Name	Description
Select DSL Latency	Select the level of DSL latency. Options are: • **Path0 Fast:** No error correction and can provide lower latency on error free lines. • **Path1 Interleaved:** Error checking that provides error free data which increases latency. If you are not certain which method is best, you can select both.
Select DSL Link Type	Select the linking protocol. **EoA** is the most popular with **PPPoA** a close second (used with many legacy ISPs). Options are: • **EoA:** Ethernet over ATM. • **PPPoA:** Point-to-Point Protocol over ATM. • **IPoA:** Internet Protocol over ATM.
Encapsulation Mode	Select whether multiple protocols or only one protocol is carried per PVC (Permanent Virtual Circuit). Options are: • **LLC/ENCAPSULATION**: (*Available for PPOA only*) Logical Link Control (LLC) encapsulation protocols used with multiple PVCs • **LLC/SNAP-BRIDGING:** LLC used to carry multiple protocols in a single PVC. • **LLC/SNAP-ROUTING**: (*Available for IPoA only*) LLC used to carry one protocol per PVC. • **VC/MUX:** Virtual Circuit Multiplexer creates a virtual connection used to carry one protocol per PVC.
Service Category	Select the bit rate protocol. Options are: • **UBR without PCR:** Unspecified Bit Rate with no Peak Cell Rate, flow control or time synchronization between the traffic source and destination. Commonly used with applications that can tolerate data / packet loss. • **UBR with PCR:** Same as above but with a Peak Cell Rate. • **CBR:** Constant Bit Rate relies on timing synchronization to make the network traffic predictable. Used commonly in Video and Audio traffic network applications. • **Non Realtime VBR:** Non Realtime Variable Bit Rate used for connections that transport traffic at a Variable Rate. This category requires a guaranteed bandwidth and latency. It does not rely on timing synchronization between the destination and source. • **Realtime VBR:** Realtime Variable Bit Rate. Same as the above option but relies on timing and synchronization between the destination and source. This category is commonly used in networks with compressed video traffic.
Minimum Cell Rate	Minimum allowable rate (cells per second) at which cells can be sent on a ATM net-

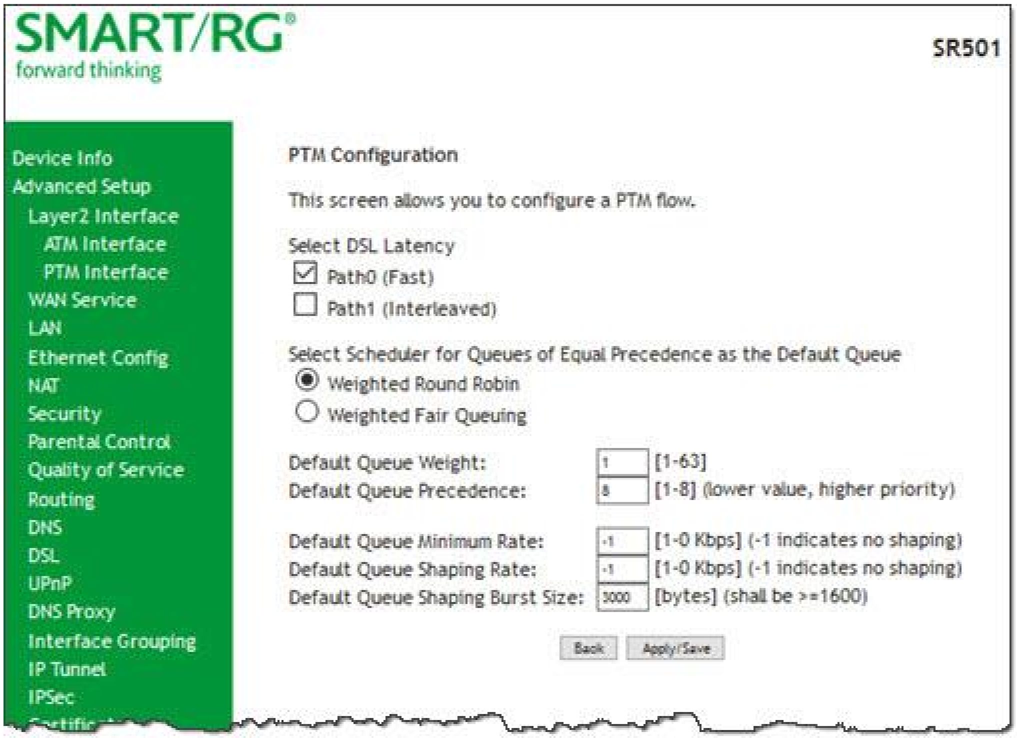
Field Name	Description
	work. The default is **-1** (no shaping).
Scheduler for Queues of Equal Precedence as the Default Queue	The algorithm used to schedule the queue behavior. VC scheduling is different than the default queues. Options are: • **Weighted Round Robin:** Packets are accessed in a round robin style. Classes can be assigned. • **Weighted Fair Queuing:** Packets are assigned to a specific queue.
Default Queue Weight	Enter a default weight of the specified queue. Options are: **1**-**63**.
Default Queue Precedence	Enter a precedence for the specified queue. Options are: **1**-**8**.
VC WRR Weight	The weight of the specified virtual channel queue. Options are **1**-**63**.
VC Precedence	The priority of the specified virtual channel queue. Options are **1**-**8.**

PTM Interface

The SmartRG gateway's VDSL2 standards support Packet Transfer Mode (PTM). An alternative to ATM mode, PTM transports packets (IP, PPP, Ethernet, MPLS, and others) over DSL links. For more information, refer to the IEEE802.3ah standard for Ethernet in the First Mile (EFM). Some 500 series gateways have a PTM interface configured by default.

On this page, you can configure a PTM interface for your gateway.

1. In the left navigation bar, click **Advanced Setup** > **Layer2 Interface** > **PTM Interface** and then click **Add**. The following page appears.



PTM Configuration

This screen allows you to configure a PTM flow.

Select DSL Latency

☑ Path0 (Fast)

□ Path1 (Interleaved)

Select Scheduler for Queues of Equal Precedence as the Default Queue

● Weighted Round Robin

○ Weighted Fair Queuing

Default Queue Weight: 1 [1-63]

Default Queue Precedence: 8 [1-8] (lower value, higher priority)

Default Queue Minimum Rate: -1 [1-0 Kbps] (-1 indicates no shaping)

Default Queue Shaping Rate: -1 [1-0 Kbps] (-1 indicates no shaping)

Default Queue Shaping Burst Size: 3000 [bytes] (shall be >=1600)

2. Modify the settings as desired.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
Select DSL Latency	Select the level of DSL latency. Options are: • **Path0 Fast:** No error correction and can provide lower latency on error free lines. • **Path1 Interleaved:** Error checking that provides error free data which increases latency. If you are not certain which method is best, you can select both.
Scheduler for Queues of Equal Precedence as the Default Queue	The algorithm used to schedule the queue behavior. VC scheduling is different than the default queues. Options are: • **Weighted Round Robin:** Packets are accessed in a round robin style. Classes can be assigned. • **Weighted Fair Queuing:** Packets are assigned to a specific queue.
Default Queue Weight	Enter a default weight of the specified queue. Options are: **1-63**.

Field Name	Description
Default Queue Precedence	Enter a precedence for the specified queue. Options are: **1**-**8**.
Default Queue Minimum Rate	The default minimum rate at which traffic can pass through the queue. For no shaping, enter **-1** (disabled). Options are: **1**-**0** Kbps.
Default Queue Shaping Rate	The shaping rate for the specified queue. Options are: **1**-**0** Kbps. The default is **-1** (no shaping).
Default Queue Shaping Burst Rate	The maximum rate at which traffic can pass through the queue. Options are **1600** or greater.

WAN Service

In this section, you can configure WAN services for:

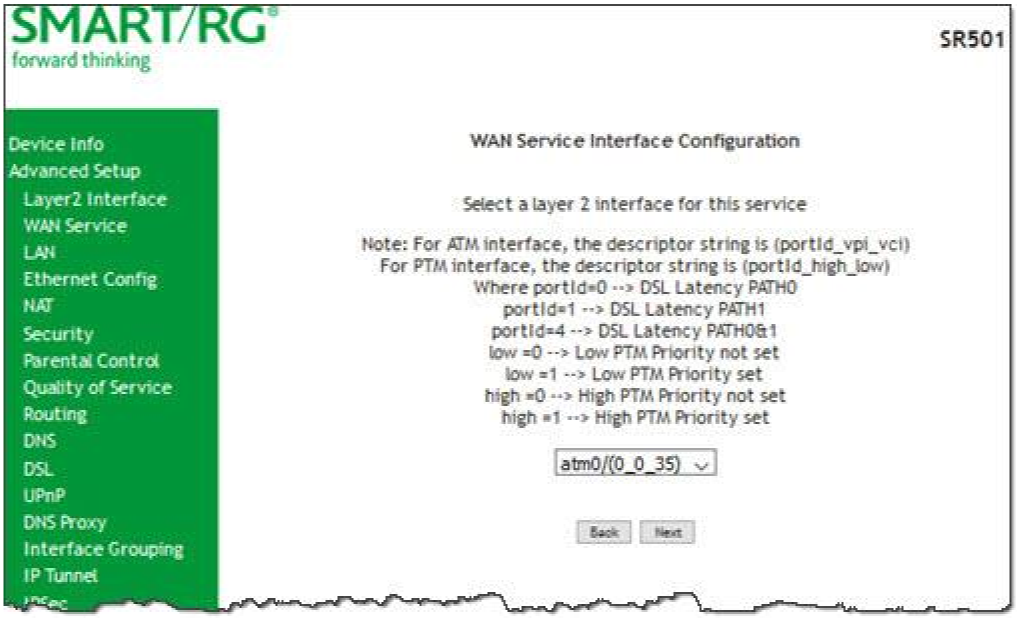
- "PPP over Ethernet"
- "IP over Ethernet"
- Bridging

Instructions are provided for each variation.

PPP over Ethernet

There are several parts to configuring a PPP over Ethernet WAN service. You will progress through several pages to complete the configuration.

1. In the left navigation bar, click **Advanced Setup** > **WAN Service** and then click **Add**. The following page appears.

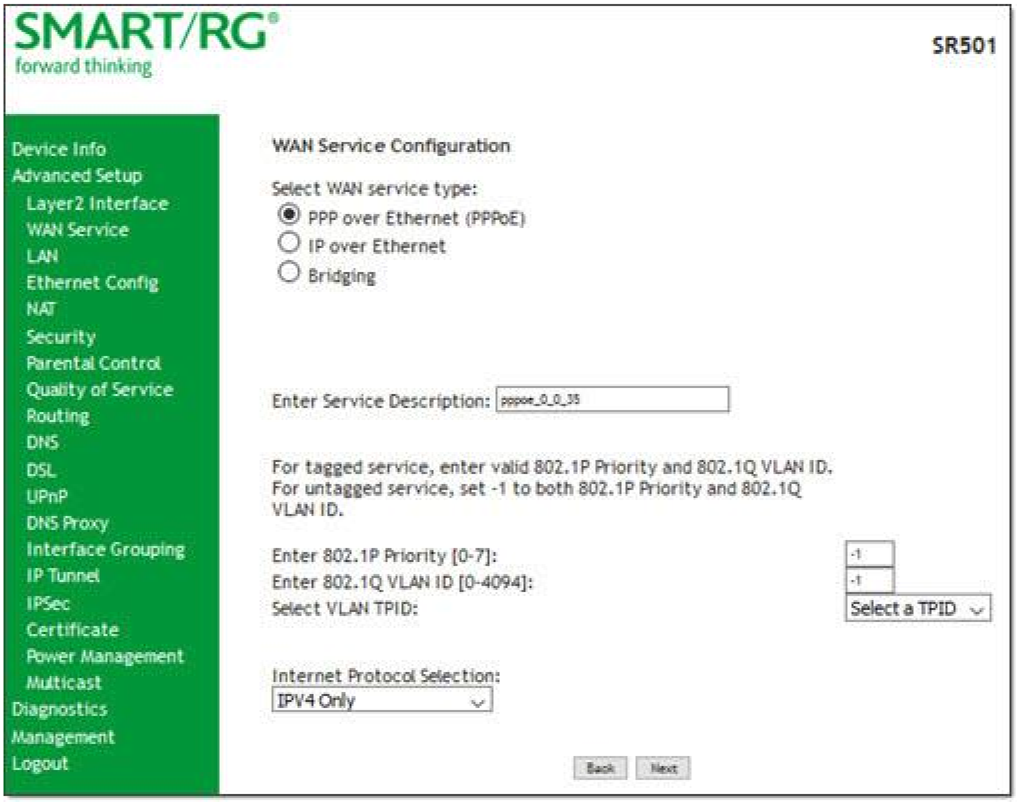


WAN Service Interface Configuration

Select a layer 2 interface for this service

Note: For ATM interface, the descriptor string is (portId_vpi_vci)
For PTM interface, the descriptor string is (portId_high_low)
Where portId=0 --> DSL Latency PATH0
portId=1 --> DSL Latency PATH1
portId=4 --> DSL Latency PATH0&1
low =0 --> Low PTM Priority not set
low =1 --> Low PTM Priority set
high =0 --> High PTM Priority not set
high =1 --> High PTM Priority set

2. Select the Layer2 interface to use for the WAN service and click **Next**. The following page appears.



WAN Service Configuration

Select WAN service type:

● PPP over Ethernet (PPPoE)
○ IP over Ethernet
○ Bridging

Enter Service Description: pppoe_0_0_35

For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.

Enter 802.1P Priority [0-7]: -1
Enter 802.1Q VLAN ID [0-4094]: -1
Select VLAN TPID: Select a TPID

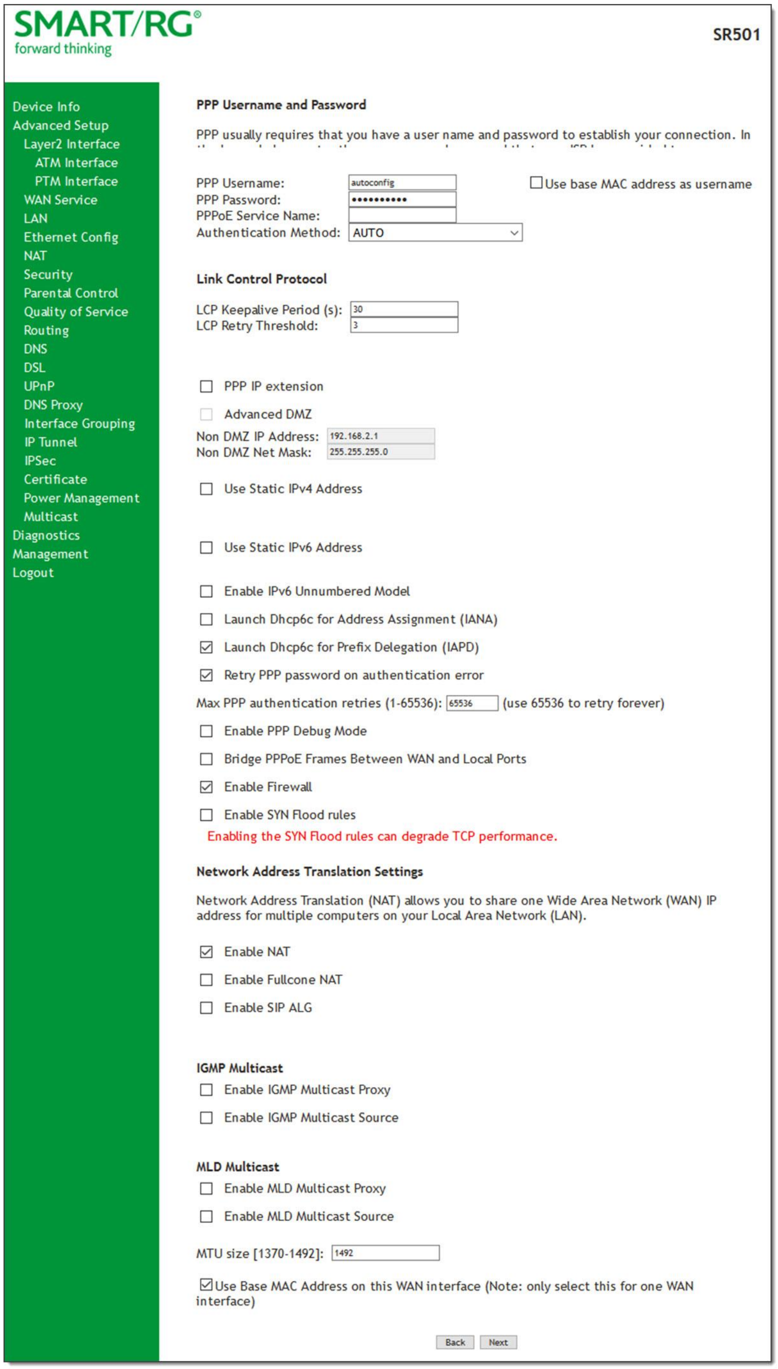
Internet Protocol Selection:
IPV4 Only

3. Select the **PPP over Ethernet (PPPoE)** WAN service type.
4. Modify the other settings as needed, using the information in the following table.

Field Name	Description
Enter Service Description	Enter a name to describe this configuration.
Enter 802.1P Priority	Options are **0** - **7**. The default is **0**. For tagged service, enter values in this field and the **802.1Q VLAN ID** field. For untagged service, enter **-1** (disabled) in this field and the **802.1Q VLAN ID** field.
Enter 802.1Q VLAN ID	Options are **0** - **4094**. The default is **-1** (disabled). For tagged service, enter values in this field and the **802.1P Priority** field. For untagged service, enter **-1** (disabled) in this field and the **802.1P Priority** field.

Field Name	Description
Select VLAN TPID	Select the TPID for this VLAN. Options are **0x8100**, **0x88A8**, and **0x9100**.
Internet Protocol Selection	Select the IP version. Options are **IPv4 Only**, **IPv4&IPv6 (Dual Stack)**, and **IPv6 Only**.

5. Click **Next**. The following page appears.



PPP Username and Password

PPP usually requires that you have a user name and password to establish your connection. In

PPP Username: autoconfig ☐ Use base MAC address as username
PPP Password: ••••••••••
PPPoE Service Name:
Authentication Method: AUTO

Link Control Protocol

LCP Keepalive Period (s): 30
LCP Retry Threshold: 3

☐ PPP IP extension

☐ Advanced DMZ

Non DMZ IP Address: 192.168.2.1
Non DMZ Net Mask: 255.255.255.0

☐ Use Static IPv4 Address

☐ Use Static IPv6 Address

☐ Enable IPv6 Unnumbered Model

☐ Launch Dhcp6c for Address Assignment (IANA)

☑ Launch Dhcp6c for Prefix Delegation (IAPD)

☑ Retry PPP password on authentication error

Max PPP authentication retries (1-65536): 65536 (use 65536 to retry forever)

☐ Enable PPP Debug Mode

☐ Bridge PPPoE Frames Between WAN and Local Ports

☑ Enable Firewall

☐ Enable SYN Flood rules

Enabling the SYN Flood rules can degrade TCP performance.

Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

☑ Enable NAT

☐ Enable Fullcone NAT

☐ Enable SIP ALG

IGMP Multicast

☐ Enable IGMP Multicast Proxy

☐ Enable IGMP Multicast Source

MLD Multicast

☐ Enable MLD Multicast Proxy

☐ Enable MLD Multicast Source

MTU size [1370-1492]: 1492

☑ Use Base MAC Address on this WAN interface (Note: only select this for one WAN interface)

6. Modify the fields as needed.

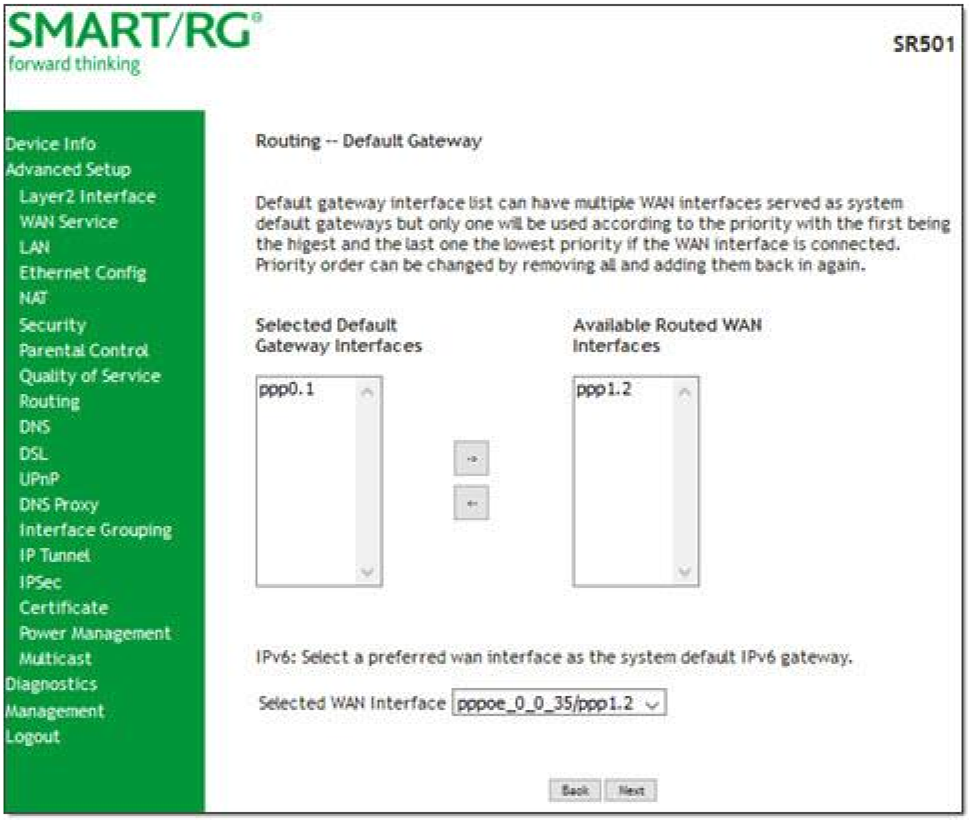
   The fields on this page are explained in the following table.

Field Name	Description
PPP Username	Enter the username required for authentication to the PPP server. To use the gateway's MAC address as the user name, click the **Use base MAC address as username** checkbox.
PPP Password	Enter the password required for authentication to the PPP server.
PPPoE Service Name	(*Optional*) Enter a description for this service.
Authentication Method	Select a means for authentication. Options are: • **AUTO**: Attempt to automatically detect handshake protocol (listed below)s. • **PAP**: Password Authentication Protocol (plaintext passwords). • **CHAP**: Challenge Handshake Authentication Protocol. (MD5 hashing scheme on passwords). • **MSCHAP**: Microsoft Challenge Handshake Authentication Protocol. (Microsoft encrypted password authentication protocol).
Link Control Protocol section	
LCP Keepalive Period	The frequency with which the keepalive packet is sent by the gateway to the PPP server.
LCP Retry Threshold	Enter the number of additional attempted packets that the gateway will send (in the event that the PPP server does not respond to the keepalive) before giving up and declaring the connection as Failed.
PPP IP Extension	Select whether to forward all traffic to the advanced DMZ IP specified in the next field. When you select this option, the NAT fields are hidden.
Advanced DMZ	(*Available only when* ***PPP IP Extension*** *is selected*) Specify the IP address and mask to which PPPoE traffic is forwarded.
Non DMZ IP Address	If using the Advanced DMZ feature, you can enter a specific vendor ID that will be broadcast for the DHCP server to accept the device, e.g., 192.168.2.1.
Non DMZ Net Mask	If using the Advanced DMZ feature, you can enter a secondary LAN IP address for the gateway. The default is **255.255.255.0**.
Use Static IPv4 Address	Click the checkbox and then specify the IPv4 Address to apply for this WAN service.
Use Static IPv6 Address	Click the checkbox and then specify the IPv6 Address to apply for this WAN service.
Enable IPv6 Unnumbered Model	(*Available only when* ***IPv4&IPv6 (Dual Stack)*** *is selected for the* ***Internet Protocol*** *field*) Select to allow your gateway to process IP packets without configuring a unique IP address. This works by "borrowing" an IP address from another interface.

Field Name	Description
Launch Dhcp6c for Address Assignment (IANA)	(*Available only when **IPv4&IPv6 (Dual Stack)** is selected for the Internet Protocol field*) Select to launch the dhcp6c client deamon to request and configure IPv6 addresses and host network configuration information.
Launch Dhcp6c for Prefix Delegation (APD)	(*Available only when **IPv4&IPv6 (Dual Stack)** is selected for the Internet Protocol field*) Select to enable your DHCPv6 server to allow your gateway to ask for an IPv6 prefix (subnet) that it can then split up and delegate to the clients it serves. This option is selected by default.
Retry PPP password on authentication error	This option is selected by default. To disable it, click the checkbox to clear it. In the **Max PPP authentication retries** field, enter the maximum number of PPP authentication retries on failure. Options are **1** - **65536**. Entering **65536** sets the maximum to unlimited.
Enable PPP Debug Mode	Select to have the system put more PPP connection information into the system log of the device. This is for debugging errors and not for normal usage.
Bridge PPPoE Frames Between WAN and Local Ports	Select to enable PPPoE passthrough to relay PPPoE connections from behind the modem. Also known as Half-Bridged mode.
Enable Firewall	This option is selected by default and *enables* functions in the **Security** sub-menu. To *disable* the firewall, click the checkbox to clear it.
Enable SYN Flood rules	Select to enable rules for preventing SYN flood distributed denial of service attacks.
Network Address Translation Settings section	
Enable NAT	Select to enable sharing the WAN interface across multiple devices on the LAN. Additional NAT and PPPoE NAT features appear.
Enable Fullcone NAT	(*Appears when **Enable NAT** is selected*) Click to enable what is known as one-to-one NAT.
Enable SIP ALG	(*Appears when **Enable NAT** is selected*) Click to enable Session Initiation Protocol (SIP) pass-through NAT. Used for Voice over IP (VOIP) applications.
IGMP Multicast section	
Enable IGMP Multicast Proxy	Click to enable Internet Group Membership Protocol (IGMP) multicast. Used by IPv4 hosts to report multicast group memberships to any neighboring multicast routers.
Enable IGMP Multicast Source	Select to enable this service to act as an IGMP multicast source.
MLD Multicast section	
Enable MLD Multicast Proxy	(*Available only for IPv6 environments*) Click to enable MLD multicast. Used by IPv4 hosts to report multicast group memberships to any neighboring multicast routers.

Field Name	Description
Enable MLD Multicast Source	(*Available only for IPv6 environments*) Click to enable this service to act as an MLD multicast source.
MTU size	Enter the MTU (Maximum Transmission Unit) size for SmartRG gateways supporting a gigabit-capable WAN interface. Options are **1370** - **1492 bytes**. The default is **1492** bytes.
Use Base MAC Address on this WAN interface	Use the SmartRG Devices Base (Primary) MAC address. When unchecked, a unique MAC is assigned for each service.

7. Click **Next**. The following page appears.



Routing -- Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

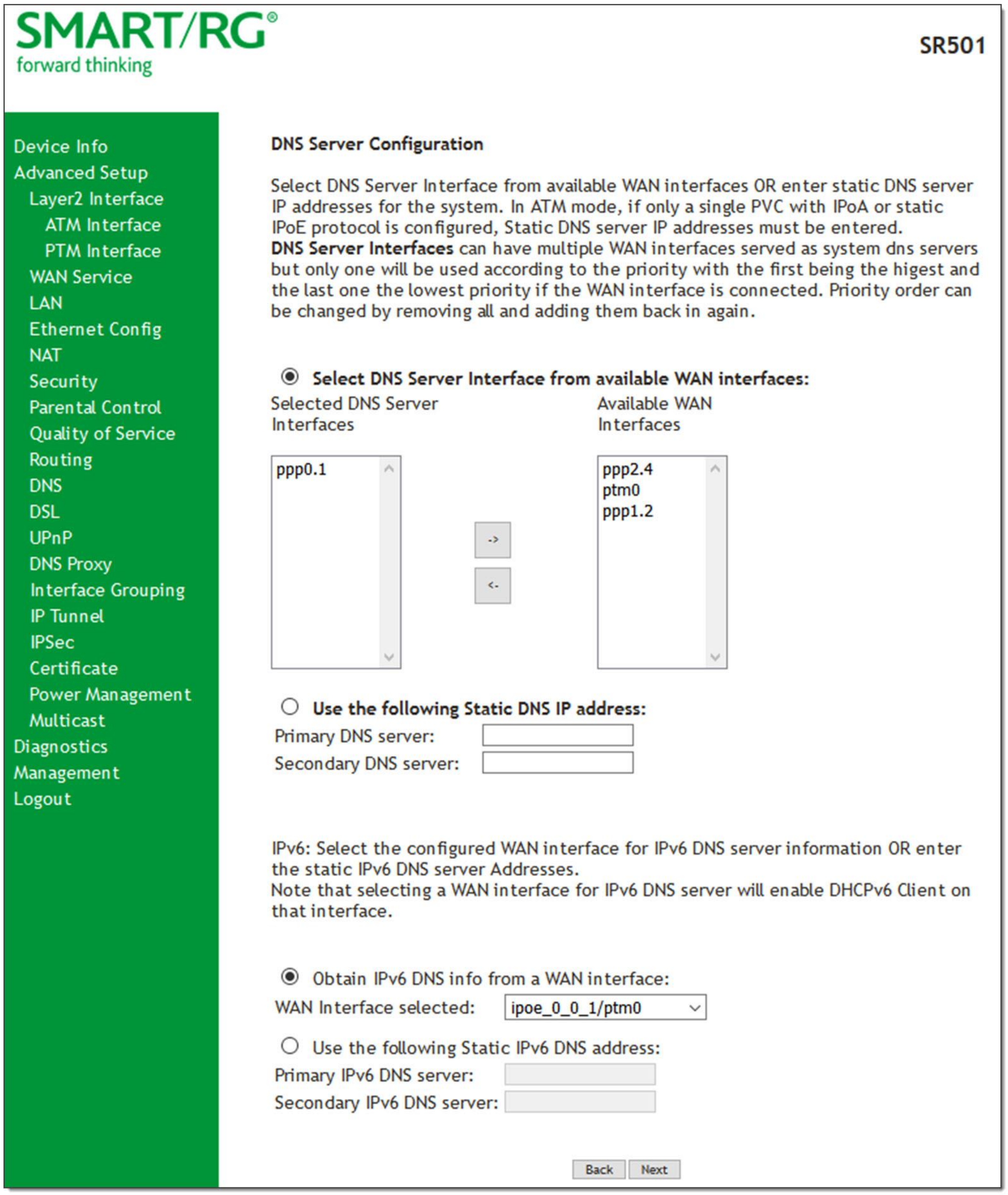
Selected Default Gateway Interfaces	Available Routed WAN Interfaces
ppp0.1	ppp1.2

IPv6: Select a preferred wan interface as the system default IPv6 gateway.

Selected WAN Interface pppoe_0_0_35/ppp1.2

8. Select the interface used as a default gateway for the PPP service being created and click the **arrows** to move your selection from left to right or from right to left.

9. Click **Next**. The following page appears where you will select DNS Server settings.



DNS Server Configuration

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.
DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

● **Select DNS Server Interface from available WAN interfaces:**

Selected DNS Server Interfaces	Available WAN Interfaces
ppp0.1	ppp2.4 ptm0 ppp1.2

○ **Use the following Static DNS IP address:**

Primary DNS server:

Secondary DNS server:

IPv6: Select the configured WAN interface for IPv6 DNS server information OR enter the static IPv6 DNS server Addresses.
Note that selecting a WAN interface for IPv6 DNS server will enable DHCPv6 Client on that interface.

● Obtain IPv6 DNS info from a WAN interface:

WAN Interface selected: ipoe_0_0_1/ptm0

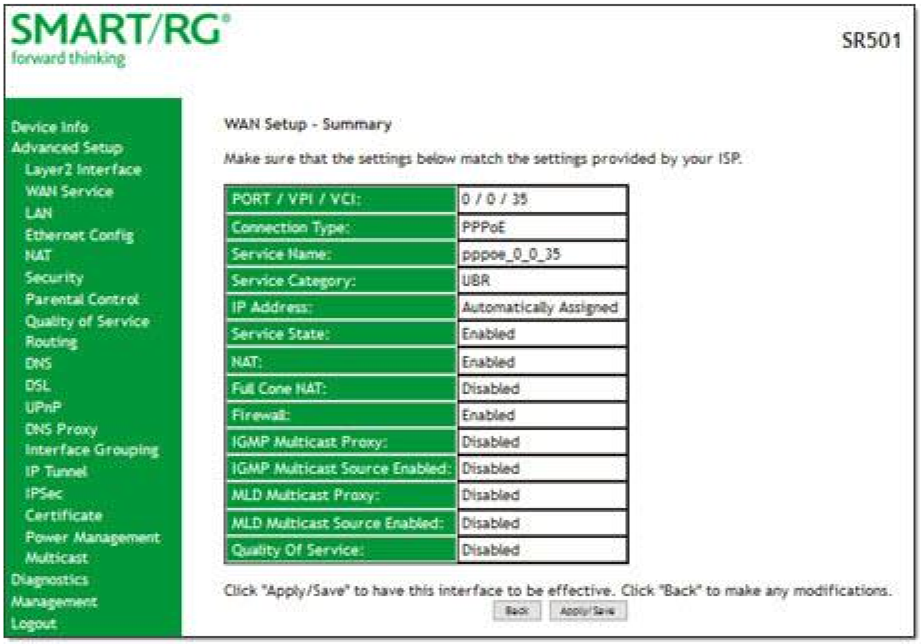
○ Use the following Static IPv6 DNS address:

Primary IPv6 DNS server:

Secondary IPv6 DNS server:

10. Select the DNS Server Interface from **Available WAN interfaces** and click the **arrows** to move your selection from left to right or from right to left.
11. Alternatively, you can enter static DNS IP addresses in the **Use the following Static DNS IP address** section.

12. Click **Next**. The summary page appears indicating that your PPPoE WAN setup is complete.



WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	PPPoE
Service Name:	pppoe_0_0_35
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Full Cone NAT:	Disabled
Firewall:	Enabled
IGMP Multicast Proxy:	Disabled
IGMP Multicast Source Enabled:	Disabled
MLD Multicast Proxy:	Disabled
MLD Multicast Source Enabled:	Disabled
Quality Of Service:	Disabled

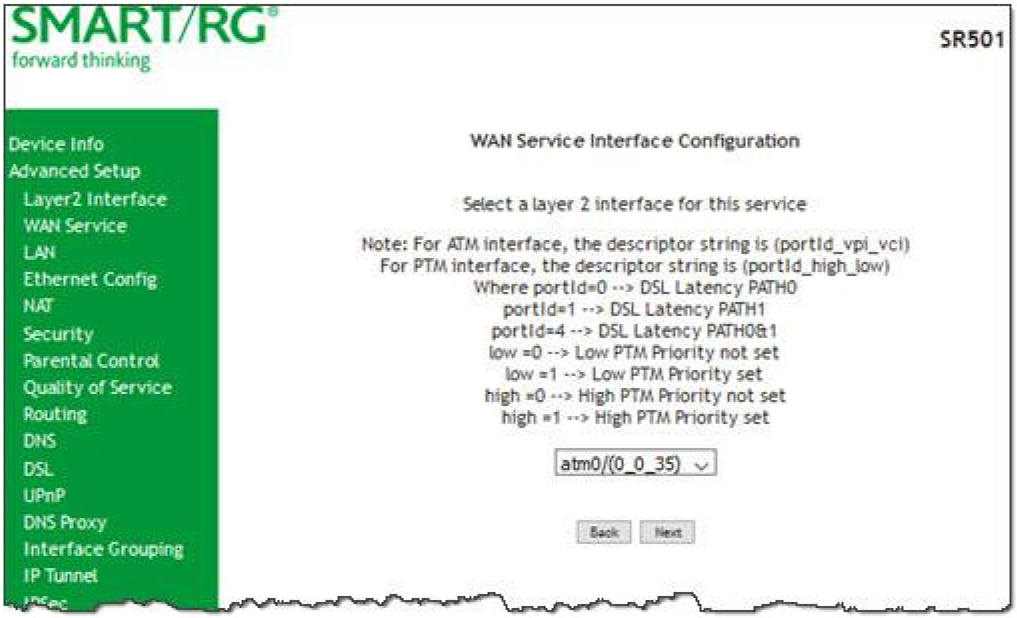
Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.

13. Review the summary and either click **Apply/Save** to commit your changes or click **Back** to step through the pages in reverse order to make any necessary alterations.

IP over Ethernet

There are several parts to configuring a IP over Ethernet WAN service. You will progress through several pages to complete the configuration.

1. In the left navigation bar, click **Advanced Setup** > **WAN Service** and then click **Add**. The following page appears.



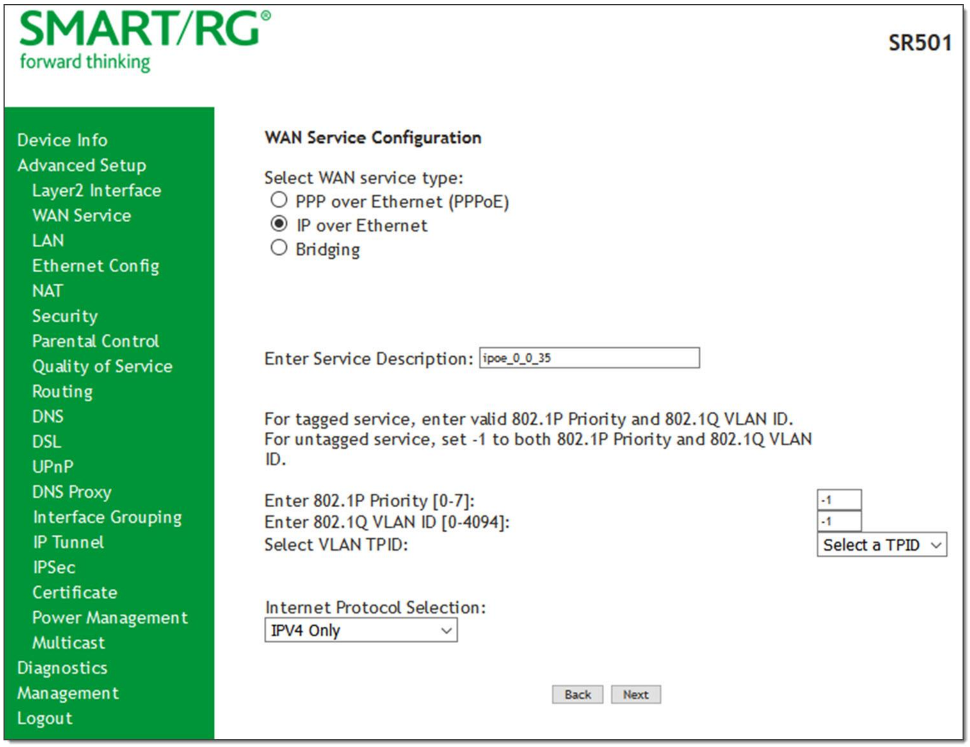
WAN Service Interface Configuration

Select a layer 2 interface for this service

Note: For ATM interface, the descriptor string is (portId_vpi_vci)
For PTM interface, the descriptor string is (portId_high_low)
Where portId=0 --> DSL Latency PATH0
portId=1 --> DSL Latency PATH1
portId=4 --> DSL Latency PATH0&1
low =0 --> Low PTM Priority not set
low =1 --> Low PTM Priority set
high =0 --> High PTM Priority not set
high =1 --> High PTM Priority set

atm0/(0_0_35)

2. Select the Layer2 interface to use for the WAN service and click **Next**. The following page appears.



WAN Service Configuration

Select WAN service type:
○ PPP over Ethernet (PPPoE)
● IP over Ethernet
○ Bridging

Enter Service Description: ipoe_0_0_35

For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.

Enter 802.1P Priority [0-7]: -1
Enter 802.1Q VLAN ID [0-4094]: -1
Select VLAN TPID: Select a TPID

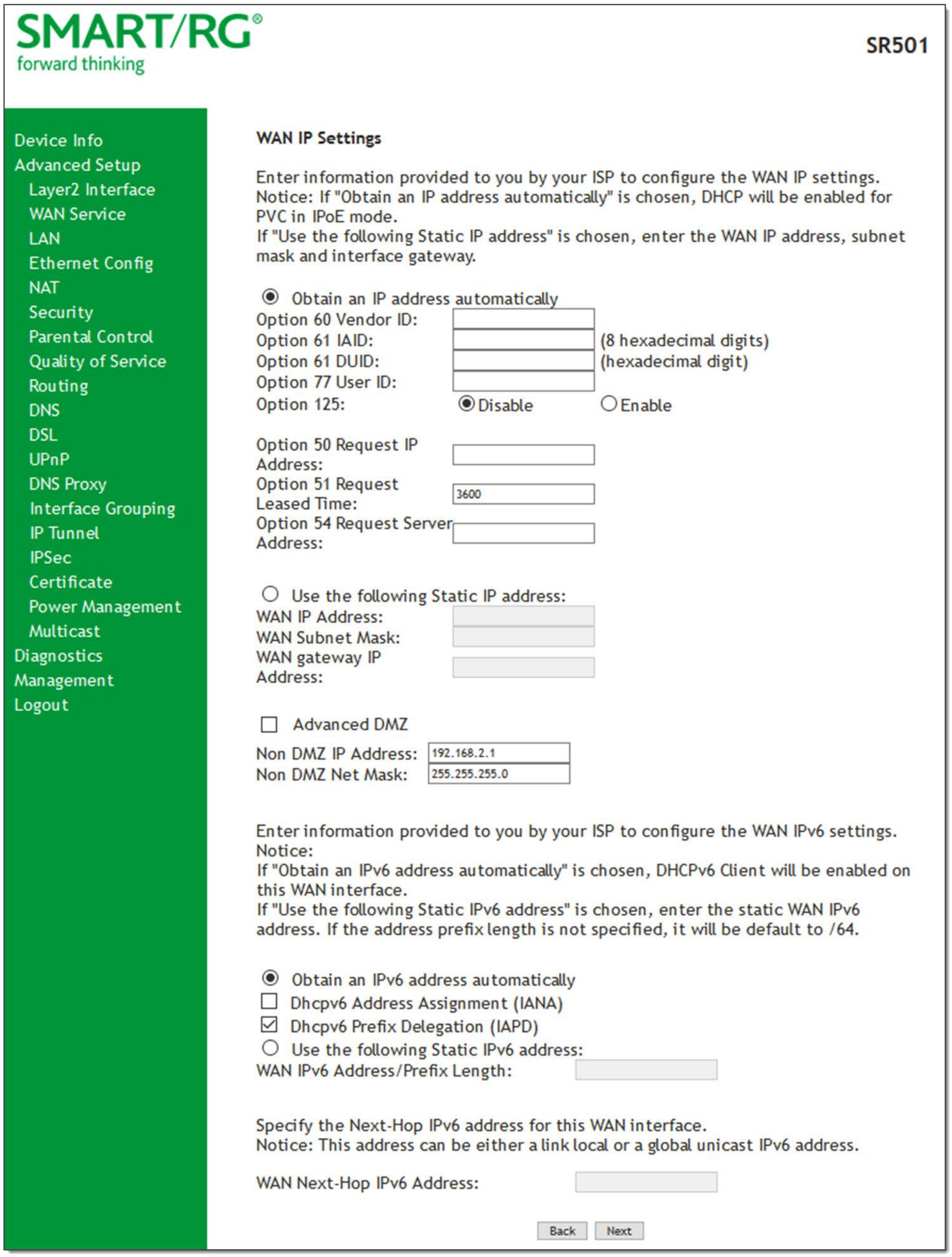
Internet Protocol Selection:
IPV4 Only

3. Select the **IP over Ethernet** WAN service type.
4. Modify the fields as needed.

   The fields on this page are explained in the following table.

Field Name	Description
Enter Service Description	(*Optional*) Enter a name to describe this configuration.
Enter 802.1P Priority	Options are **0** - **7**. The default is **0**. For tagged service, enter values in this field and the **802.1Q VLAN ID** field. For untagged service, enter **-1** (disabled) in this field and the **802.1Q VLAN ID** field.
Enter 802.1Q VLAN ID	Options are **0** - **4094**. The default is **-1** (disabled). For tagged service, enter values in this field and the **802.1P Priority** field. For untagged service, enter **-1** (disabled) in this field and the **802.1P Priority** field.
Select VLAN TPID	Select the TPID for this VLAN. Options are **0x8100**, **0x88A8**, and **0x9100**.
Internet Protocol Selection	This data packet scheduling technique allows different scheduling priorities to be applied to statistically multiplexed data flows. Since each data flow has its own queue, an ill-behaved flow (which has sent larger packets or more packets per second than the others since it became active) will only punish itself and not other sessions. Options are **IPv4 Only**, **IPv4&IPv6 (Dual Stack)**, and **IPv6 Only**. The default is **IPv4 Only**. **Note:** When selecting **IPV4&IPV6** or **IPV6**, the subsequent options presented will change accordingly.

5. Click **Next**. The following page appears.



WAN IP Settings

Enter information provided to you by your ISP to configure the WAN IP settings.
Notice: If "Obtain an IP address automatically" is chosen, DHCP will be enabled for PVC in IPoE mode.
If "Use the following Static IP address" is chosen, enter the WAN IP address, subnet mask and interface gateway.

● Obtain an IP address automatically

Option 60 Vendor ID:		
Option 61 IAID:		(8 hexadecimal digits)
Option 61 DUID:		(hexadecimal digit)
Option 77 User ID:		
Option 125:	● Disable	○ Enable

Option 50 Request IP Address:	
Option 51 Request Leased Time:	3600
Option 54 Request Server Address:	

○ Use the following Static IP address:

WAN IP Address:	
WAN Subnet Mask:	
WAN gateway IP Address:	

□ Advanced DMZ

Non DMZ IP Address:	192.168.2.1
Non DMZ Net Mask:	255.255.255.0

Enter information provided to you by your ISP to configure the WAN IPv6 settings.
Notice:
If "Obtain an IPv6 address automatically" is chosen, DHCPv6 Client will be enabled on this WAN interface.
If "Use the following Static IPv6 address" is chosen, enter the static WAN IPv6 address. If the address prefix length is not specified, it will be default to /64.

● Obtain an IPv6 address automatically
□ Dhcpv6 Address Assignment (IANA)
☑ Dhcpv6 Prefix Delegation (IAPD)
○ Use the following Static IPv6 address:
WAN IPv6 Address/Prefix Length:

Specify the Next-Hop IPv6 address for this WAN interface.
Notice: This address can be either a link local or a global unicast IPv6 address.

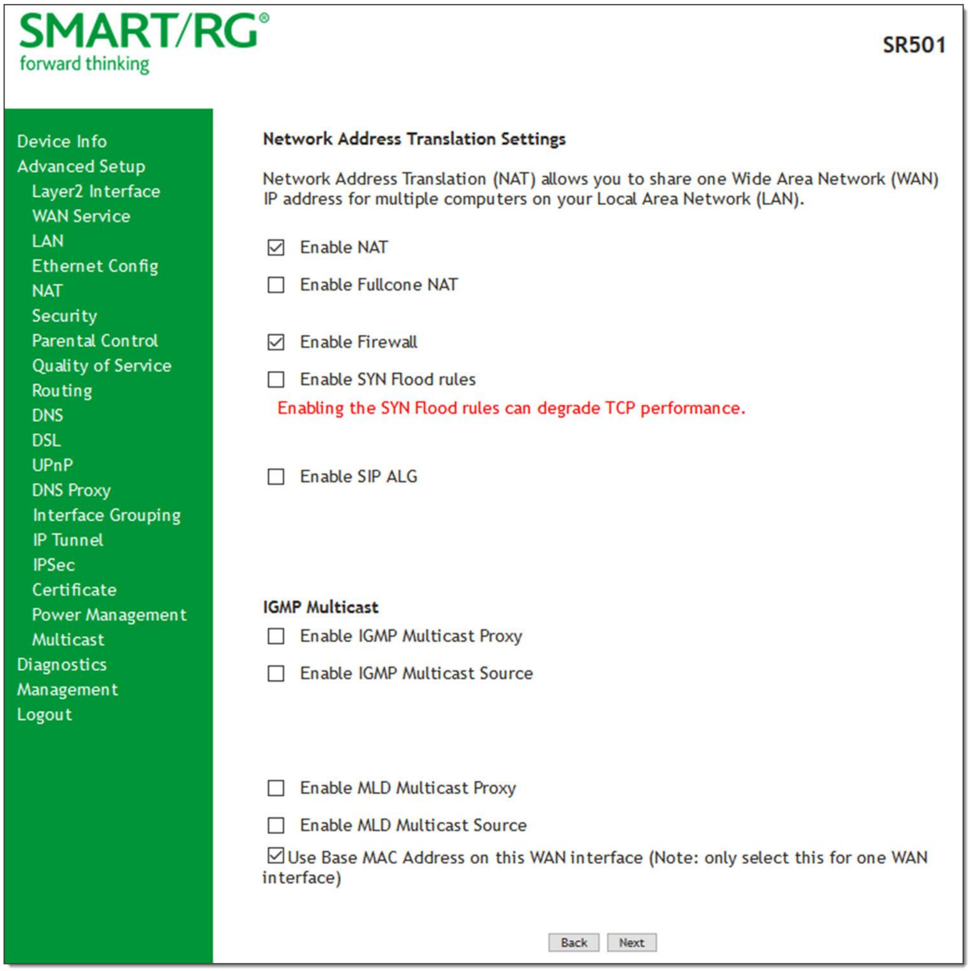
WAN Next-Hop IPv6 Address:

6. Enter the relevant WAN IP Settings, using the information provided in the following table.

Field Name	Description
Obtain an IP address automatically	Select when you want the ISP to automatically assign the WAN IP to the gateway.
Option 60 Vendor ID	(*Optional*) Broadcast a specific vendor ID for the DHCP server to accept the device.
Option 61 IAID	(*Optional*) Interface Association Identifier (IAID). A unique identifier for an IA, chosen by the client.
Option 61 DUID	(*Optional*) DHCP Unique Identifier (DUID) is used by the client to get an IP address from the DHCP server.
Option 77 User ID	(*Optional*) Enter the user class ID that should be used to filter traffic.
Option 125	(*Optional*) Select whether to enable local devices to automatically receive DHCP options from the server. This option is disabled by default. To enable it, click **Enabled**.
Option 50 Request IP Address	Select to request a specific IP address when sending messages. If the address is not available, the DHCP server assigns the next allowed IP address.
Option 51 Request Leased Time	Select to request the maximum lease time defined for the client.
Option 54 Request Server Address	Select to request the IP address of the source server.
Use the following Static IP address	Select when you want to manually declare the static IP information provided by your ISP. The WAN address fields become available.
WAN IP Address	Enter the static WAN IPV4 Address.
WAN Subnet Mask	Enter the static subnet mask.
WAN gateway IP Address	Enter the static gateway IP address.
Advanced DMZ	(*Optional*) Select this option to enable Advanced DMZ on the WAN service. For more information, see the knowledgebase on SmartRG Support site.
Non DMZ IP Address	If using the Advanced DMZ feature, you can enter a specific vendor ID that will be broadcast for the DHCP server to accept the device, e.g., 192.168.2.1.
Non DMZ Net Mask	If using the Advanced DMZ feature, you can enter a secondary LAN IP address for the gateway. The default is **255.255.255.0**.
IPv6 settings The following fields appear when either **IPv6 Only** or **IPv4&IPv6 (Dual Stack)** network protocols are selected on	

Field Name	Description
the WAN Service Configuration page.	
Obtain IPv6 address automatically	Enables the DHCPv6 Client on this WAN interface. Select this option when you want the ISP to automatically assign the WAN IP to the gateway.
Dhcpv6 Address Assignment (IANA)	Select this option for the CPE to receive WAN IP from ISP.
Dhcpv6 Prefix Delegation (IAPD)	Select this option for the CPE to generate the WAN IP's prefix from the server's REST by MAC address.
Use the following Static IPv6 address	Select this option to manually declare the v6 Static IP information provided by your ISP.
WAN IPv6 Address/Prefix Length	If entering a static IP address, enter the IP address / prefix length. If you do not specify a prefix length, the default of **/64** is used.
WAN Next-Hop IPv6 address	Enter the IP address of the next WAN in the group. This address can be either a local link or a global unicast IPv6 address.

7. Click **Next**. The **NAT settings** page appears.



Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

☑ Enable NAT

□ Enable Fullcone NAT

☑ Enable Firewall

□ Enable SYN Flood rules

Enabling the SYN Flood rules can degrade TCP performance.

□ Enable SIP ALG

IGMP Multicast

□ Enable IGMP Multicast Proxy

□ Enable IGMP Multicast Source

□ Enable MLD Multicast Proxy

□ Enable MLD Multicast Source

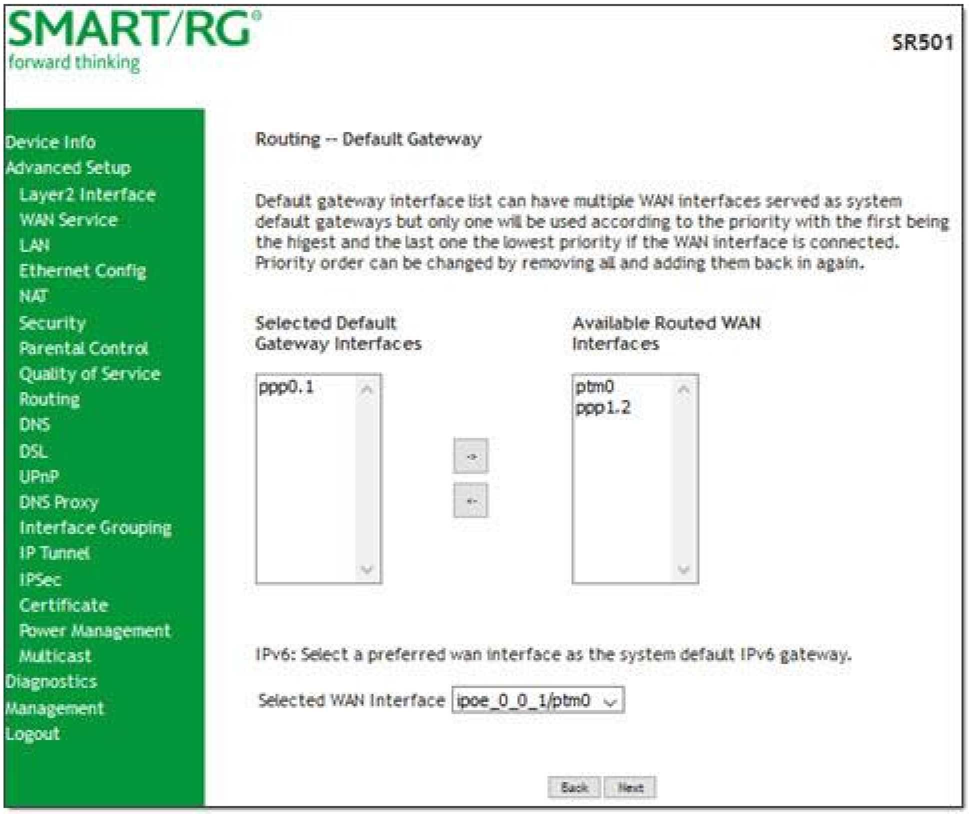
☑ Use Base MAC Address on this WAN interface (Note: only select this for one WAN interface)

8. Modify the settings if desired. All settings are optional.
   Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN). If you do not want to enable NAT (atypical) and wish the user of this gateway to access the Internet normally, you need to add a route on the uplink equipment. Failure to do so will cause access to the Internet to fail.

   The fields on this page are explained in the following table.

FIELD NAME	DESCRIPTION
Enable NAT	Enables sharing the WAN interface across multiple devices on the LAN. Also enables the functions in the NAT sub-menu and addition PPPoE NAT features to select. **Note:** This option and its related options are not available when IPv6 is selected as the Internet protocol.
Enable Fullcone NAT	(*Appears when* ***Enable NAT*** *is selected*) Enables what is known as one-to-one NAT.
Enable SYN Flood rules	Select to enable rules for preventing SYN flood distributed denial of service attacks.
Enable Firewall	Select to enable functions in the **Security** sub-menu.
Enable SIP ALG	(*Appears when* ***Enable NAT is selected***) Enables Session Initiation Protocol (SIP) pass-through NAT. Used for Voice over IP (VOIP) applications.
Enable IGMP Multicast Proxy	Click to enable Internet Group Membership Protocol (IGMP) multicast. Used by IPv4 hosts to report multicast group memberships to any neighboring multicast routers.
Enable IGMP Multicast Source	Select to enable this service to act as an IGMP multicast source.
Enable MLD Multicast Proxy	(*Available only for IPv6 environments*) Click to enable MLD multicast. Used by IPv4 hosts to report multicast group memberships to any neighboring multicast routers.
Enable MLD Multicast Source	(*Available only for IPv6 environments*) Click to enable this service to act as an MLD multicast source.
Use Base MAC Address on this WAN interface	Use SmartRG Devices Base (Primary) MAC address. When unchecked, a unique MAC per service is assigned.

9. Click **Next**. The following page appears.



Routing -- Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

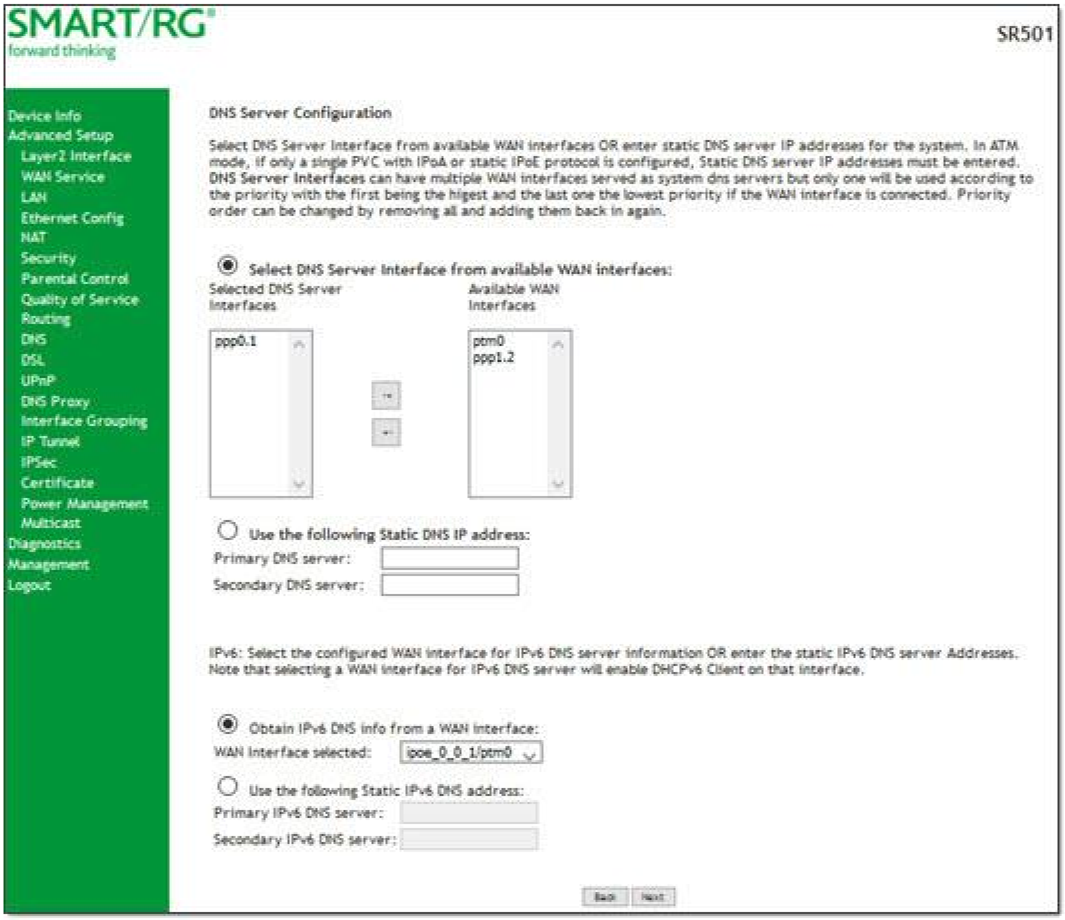
Selected Default Gateway Interfaces		Available Routed WAN Interfaces
ppp0.1	-> <-	ptm0 ppp1.2

IPv6: Select a preferred wan interface as the system default IPv6 gateway.

Selected WAN Interface ipoe_0_0_1/ptm0

10. Select the interface used as a default gateway for the PPP service being created and click the **arrows** to move your selection from left to right or from right to left.

11. Click **Next**. The following page appears where you will select DNS Server settings.



DNS Server Configuration

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered. DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

● Select DNS Server Interface from available WAN interfaces:

Selected DNS Server Interfaces: ppp0.1

Available WAN Interfaces: ptm0, ppp1.2

○ Use the following Static DNS IP address:

Primary DNS server:

Secondary DNS server:

IPv6: Select the configured WAN interface for IPv6 DNS server information OR enter the static IPv6 DNS server Addresses. Note that selecting a WAN interface for IPv6 DNS server will enable DHCPv6 Client on that interface.

● Obtain IPv6 DNS info from a WAN interface:

WAN Interface selected: ipoe_0_0_1/ptm0

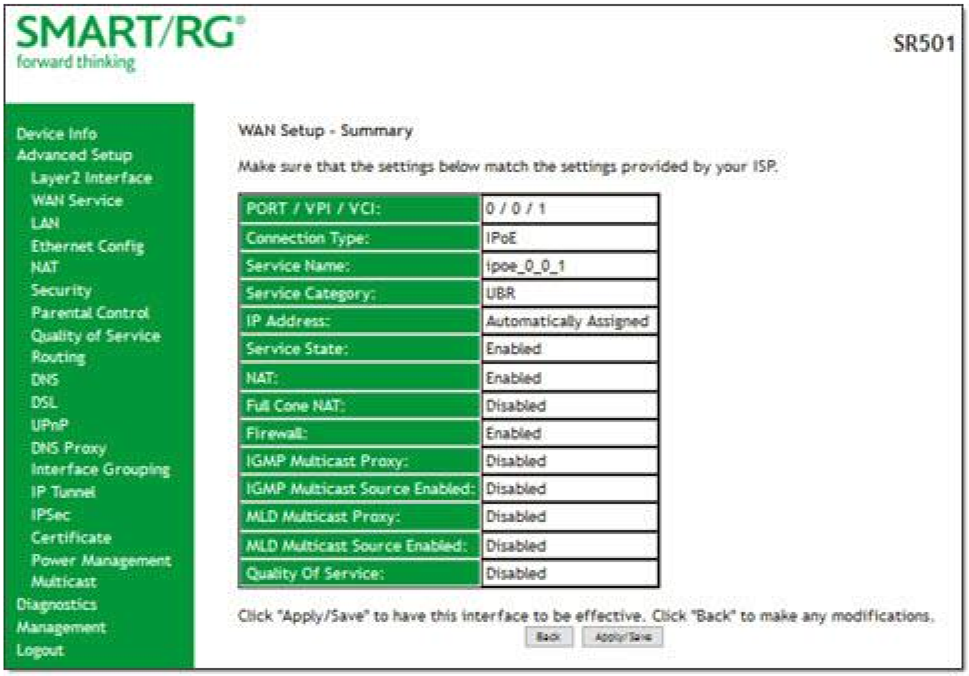
○ Use the following Static IPv6 DNS address:

Primary IPv6 DNS server:

Secondary IPv6 DNS server:

12. Select the DNS Server Interface from available WAN interfaces and click the **arrows** to move your selection from left to right or from right to left.
13. Alternatively, you can enter static DNS IP addresses in the **Use the following Static DNS IP address** section.
14. If you selected IPv6 as the Internet protocol earlier, you can configure the same DNS server information in the following fields:
    - **Obtain IPv6 DNS info from a WAN interface**: Select a **WAN Interface**.
    - **Use the following Static IPv6 DNS address**: Enter the **Primary IPv6 DNS server** address and, if desired, enter a **Secondary IPv6 DNS server** address.

15. Click **Next**. The summary page appears.



WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

PORT / VPI / VCI:	0 / 0 / 1
Connection Type:	IPoE
Service Name:	ipoe_0_0_1
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Full Cone NAT:	Disabled
Firewall:	Enabled
IGMP Multicast Proxy:	Disabled
IGMP Multicast Source Enabled:	Disabled
MLD Multicast Proxy:	Disabled
MLD Multicast Source Enabled:	Disabled
Quality Of Service:	Disabled

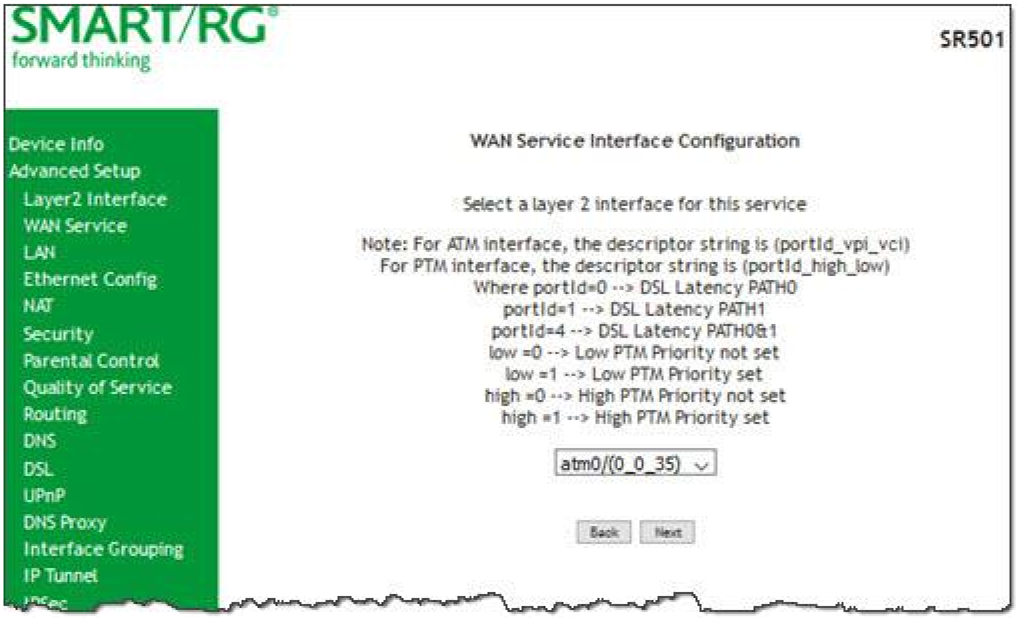
Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.

16. Review the summary and either click **Apply/Save** to commit your changes or click **Back** to step through the pages in reverse order to make any necessary alterations.

Bridging

Before you can configure a bridge WAN service, you must create the related ATM interface.

1. In the left navigation bar, click **Advanced Setup** > **WAN Service** and then click **Add**. The following page appears.



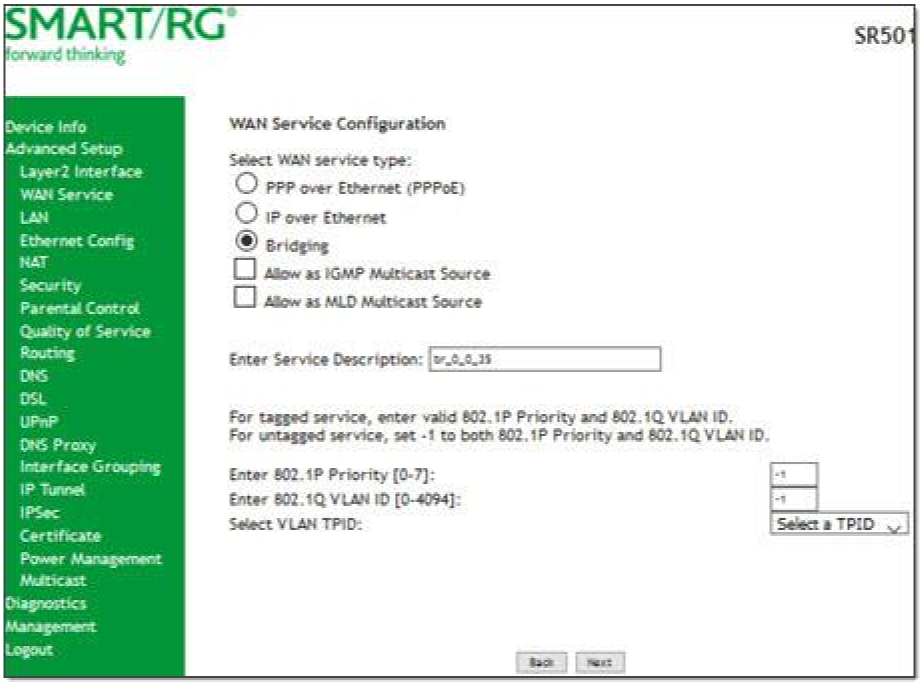
WAN Service Interface Configuration

Select a layer 2 interface for this service

Note: For ATM interface, the descriptor string is (portId_vpi_vci)
For PTM interface, the descriptor string is (portId_high_low)
Where portId=0 --> DSL Latency PATH0
portId=1 --> DSL Latency PATH1
portId=4 --> DSL Latency PATH0&1
low =0 --> Low PTM Priority not set
low =1 --> Low PTM Priority set
high =0 --> High PTM Priority not set
high =1 --> High PTM Priority set

atm0/(0_0_35)

2. Select an ATM interface for the WAN service and then click **Next**. The following page appears.



WAN Service Configuration

Select WAN service type:
○ PPP over Ethernet (PPPoE)
○ IP over Ethernet
● Bridging
□ Allow as IGMP Multicast Source
□ Allow as MLD Multicast Source

Enter Service Description: br_0_0_35

For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.

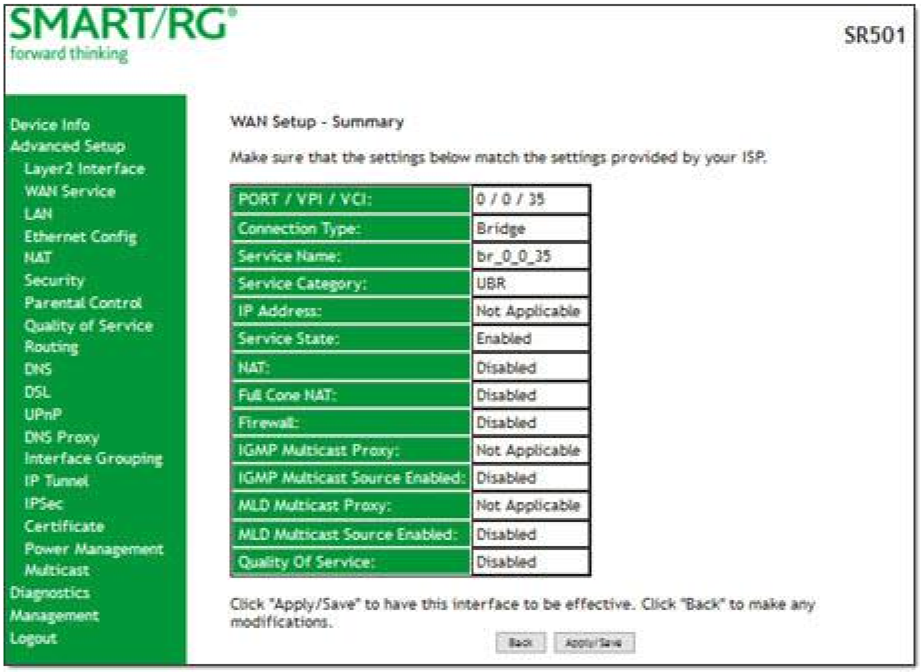
Enter 802.1P Priority [0-7]: -1
Enter 802.1Q VLAN ID [0-4094]: -1
Select VLAN TPID: Select a TPID

3. Select **Bridging**. The Multicast Source fields appear.

4. Modify the other fields as needed, using the information in the following table.

Field Name	Description
Allow as IGMP Multicast Source	Select to enable this service to act as an IGMP multicast source.
Allow as MLD Multicast Source	Select to enable this service to act as an MLD multicast source.
Enter Service Description	(*Optional*) Enter a name to describe this configuration.
Enter 802.1P Priority	Options are **0** - **7**. The default is **-1** (disabled). For tagged service, enter values in this field and the **802.1Q VLAN ID** field. For untagged service, accept the default of **-1** in this field and in the **802.1Q VLAN ID** field.
Enter 802.1Q VLAN ID	Options are **0** - **4094**. The default is **-1** (disabled). For tagged service, enter values in this field and the **802.1P Priority** field. For untagged service, enter **-1** (disabled) in this field and in the **802.1P Priority** field.
Select VLAN TPID	(*Optional*) Select the TPID for this VLAN. Options are **0x8100**, **0x88A8**, and **0x9100**.

5. Click **Next**. The summary page appears indicating that your Bridging WAN setup is complete.



WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	Bridge
Service Name:	br_0_0_35
Service Category:	UBR
IP Address:	Not Applicable
Service State:	Enabled
NAT:	Disabled
Full Cone NAT:	Disabled
Firewall:	Disabled
IGMP Multicast Proxy:	Not Applicable
IGMP Multicast Source Enabled:	Disabled
MLD Multicast Proxy:	Not Applicable
MLD Multicast Source Enabled:	Disabled
Quality Of Service:	Disabled

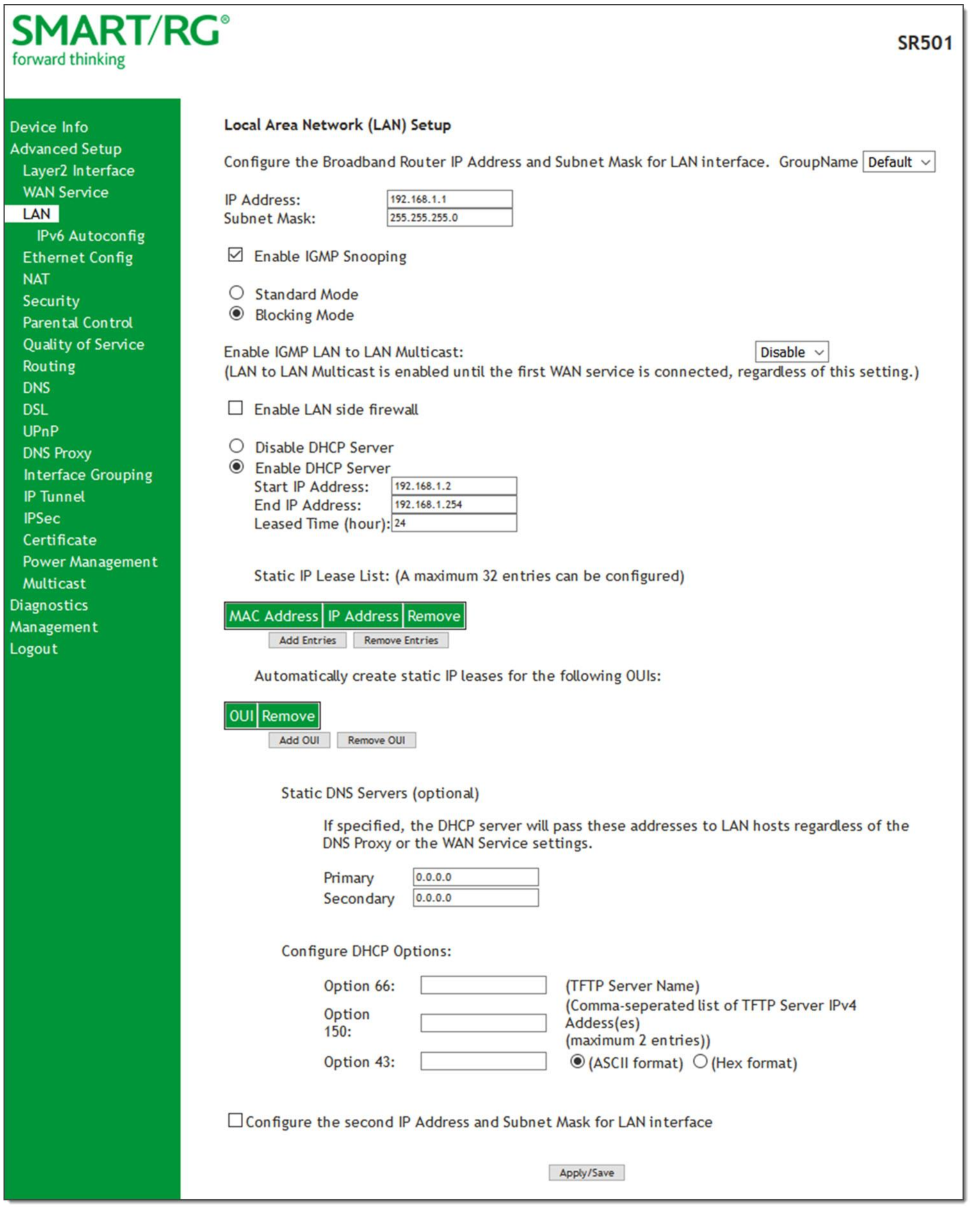
Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.

6. Review the summary and either click **Apply/Save** to commit your changes or click **Back** to step through the pages in reverse order to make any necessary alterations.

LAN

On the Local Area Network (LAN) Setup page, you can configure the router's local IP addresses, subnet mask, DHCP behavior and other related LAN side settings for your gateway.

1. In the left navigation bar, click **Advanced Setup** > **LAN**. The following page appears.



Local Area Network (LAN) Setup

Configure the Broadband Router IP Address and Subnet Mask for LAN interface. GroupName Default

IP Address: 192.168.1.1
Subnet Mask: 255.255.255.0

☑ Enable IGMP Snooping

○ Standard Mode
● Blocking Mode

Enable IGMP LAN to LAN Multicast: Disable
(LAN to LAN Multicast is enabled until the first WAN service is connected, regardless of this setting.)

☐ Enable LAN side firewall

○ Disable DHCP Server
● Enable DHCP Server
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
Leased Time (hour): 24

Static IP Lease List: (A maximum 32 entries can be configured)

MAC Address	IP Address	Remove

Automatically create static IP leases for the following OUIs:

OUI	Remove

Static DNS Servers (optional)

If specified, the DHCP server will pass these addresses to LAN hosts regardless of the DNS Proxy or the WAN Service settings.

Primary 0.0.0.0
Secondary 0.0.0.0

Configure DHCP Options:

Option 66: (TFTP Server Name)
Option 150: (Comma-seperated list of TFTP Server IPv4 Addess(es) (maximum 2 entries))
Option 43: ● (ASCII format) ○ (Hex format)

☐ Configure the second IP Address and Subnet Mask for LAN interface

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2. Customize the fields as desired.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

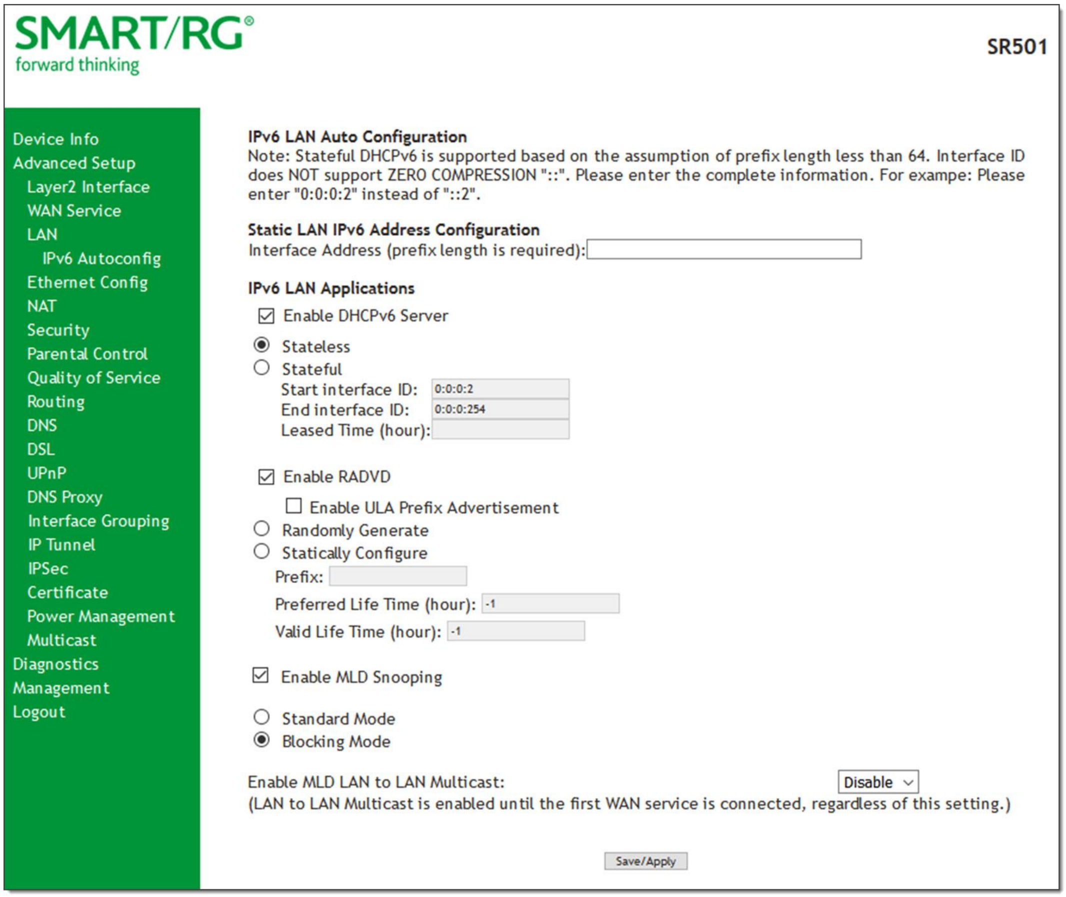
Field Name	Description
GroupName	Select an interface group from the list of available groups (defined on the Interface Grouping page).
IP Address	Enter the LAN IP address by which LAN devices will connect to this gateway.
Subnet Mask	Enter the Subnet mask to be used by LAN devices connecting to this gateway.
Enable IGMP Snooping	Enables your gateway to listen to IGMP network traffic between hosts and routers. By listening to these conversations, the gateway maintains a map of which links need which IP multicast streams.
Standard Mode	Allows multicast traffic will flood to all bridge ports when there is no client subscribed to any multicast group.
Blocking Mode	Blocks multicast data traffic, preventing it from flooding to all bridge ports when no client subscriptions to a multicast group are present.
Enable IGMP LAN to LAN Multicast	Allows multicast traffic between LANs.
Enable LAN Side Firewall	Enables the restriction of traffic between LAN hosts.
Disable DHCP Server	Prevents the DHCP functionality of your gateway from automatically assigning LAN IP addresses to host devices as they connect with the gateway.
Enable DHCP Server	Allows the DHCP functionality of your gateway to automatically assign LAN IP addresses to host devices as they connect with the gateway. Fill in the next three fields to configure this action.
Start IP Address	(*Becomes editable when* ***Enable DHCP Server*** *is selected*) Enter the beginning of the class C, IP address range to be assigned by the DHCP server.
End IP Address	(*Becomes editable when* ***Enable DHCP Server*** *is selected*) Enter the end of the class C, IP address range to be assigned by the DHCP server.
Leased Time (hour)	(*Becomes editable when* ***Enable DHCP Server*** *is selected*) Enter the number of hours for which an IP address will be leased.
Static IP Lease List	Specify a literal, static IP address to be associated with a specific MAC Address of one of your LAN host devices.

Field Name	Description
	1. Click **Add Entries**. 2. Enter the MAC address and IP address and click **Apply/Save**. 3. Repeat these steps to create any additional entries that you need up to 32.
Automatically create static IP leases from the following OUIs	For LAN hosts, IP addresses can be assigned manually or by using DHCP. 1. Click **Add OUI**. 2. Enter the OUI and click **Apply/Save**. 3. Repeat these steps to create any additional entries that you need.
Static DNS Servers	(*Optional*) Enter the IP addresses for the **Primary** and **Secondary** DNS servers.
Configure DHCP Options section	
Option 66	For devices that require access to a TFTP server (device configuration name files are in .cnf file format), which enables the device to communicate with other infrastructure, select this option to specify the name of the TFTP server.
Option 150	A Cisco proprietary methodology for pointing to one or two TFTP servers.
Option 43	A Cisco proprietary methodology for providing the Cisco Aironet Controller address to your access point.
Configure the second IP address and subnet mask for LAN interface	When you select this option, the **IP Address** and **Subnet Mask** fields appear where you can enter a second IP address and Subnet mask to support a second, simultaneous LAN, i.e., the primary LAN might be defined as 192.168.0.1 and this secondary LAN defined as 192.168.2.1.

IPv6 Autoconfig

On this page, you can configure your gateway's IPv6 environment.

1. In the left navigation bar, click **Advanced Setup** > **LAN** > **IPv6 Autoconfig**. The following page appears.



IPv6 LAN Auto Configuration
Note: Stateful DHCPv6 is supported based on the assumption of prefix length less than 64. Interface ID does NOT support ZERO COMPRESSION "::". Please enter the complete information. For exampe: Please enter "0:0:0:2" instead of "::2".

Static LAN IPv6 Address Configuration
Interface Address (prefix length is required):

IPv6 LAN Applications
☑ Enable DHCPv6 Server
● Stateless
○ Stateful
Start interface ID: 0:0:0:2
End interface ID: 0:0:0:254
Leased Time (hour):

☑ Enable RADVD
□ Enable ULA Prefix Advertisement
○ Randomly Generate
○ Statically Configure
Prefix:
Preferred Life Time (hour): -1
Valid Life Time (hour): -1

☑ Enable MLD Snooping

○ Standard Mode
● Blocking Mode

Enable MLD LAN to LAN Multicast: Disable
(LAN to LAN Multicast is enabled until the first WAN service is connected, regardless of this setting.)

2. Modify the fields as needed, using the information in the table below.
3. Click **Save/Apply** to commit your changes.

The fields on this page are explained in the following table.

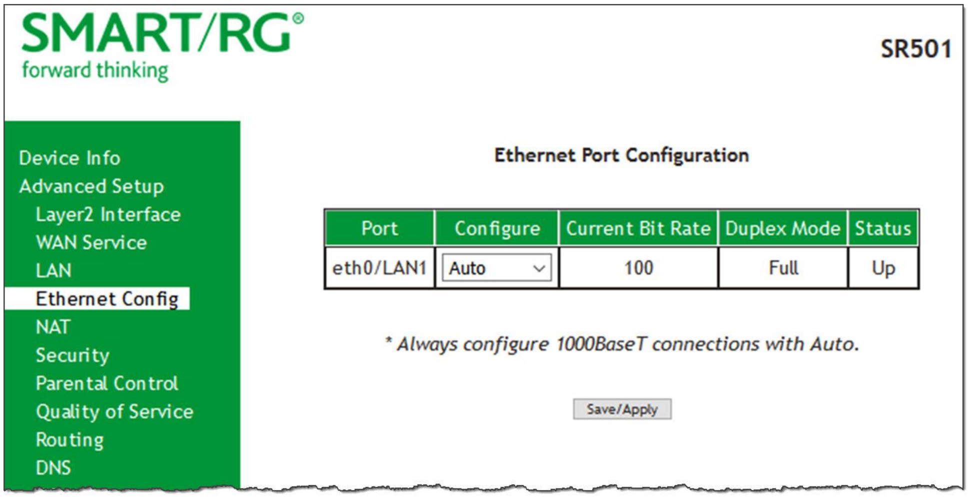
Field Name	Description
Interface Address	IPV6 address to assign as the gateways Local LAN IPV6 address and prefix length. Prefix length is required.
IPv6 LAN Applications section	
Enable DHCP v6 Server	This option enables the DHCP v6 feature on the LAN.

Field Name	Description
Stateless	This option is *selected* by default. Click to *stop* inheriting IPV6 address assignments from the WAN IPV6 interface.
Stateful	DHCPv6 server given by the LAN IPV6 network as configured with additional options. Zero compression is not supported. Make sure to enter zeros between the colons, that is, do not use shorthand notation (::2). Options are: • **Start interface ID**: Enter the beginning IPv6 available addresses for DHCP to assign to LAN devices. • **End interface ID**: Enter the ending IPv6 available addresses for DHCP to assign to LAN devices. • **Leased Time (hour):** Amount of time before a new IPv6 lease is requested by the LAN client.
Enable RADVD	(*Optional*) This option is *enabled* by default. It enables Router Advertisement Daemon (RADVD) service that sends router advertisements to LAN clients. Clear the check box to disable RADVD. Options are: • **Enable ULA Prefix Advertisement:** Check this option to enable unique local address (ULA) advertisement on the LAN. When you select this option, the **Randomly Generate** option is selected and the gateway can generate a random IPv6 prefix. • **Statically Configure Prefix:** Select this option to configure the IPv6 prefix, and enter values in the **Preferred Life Time** and **Valid Life Time** fields (in hours). The default value for these fields is **-1** (no limit).
Enable MLD Snooping	(*Optional*) This option is *enabled* by default. It enables Multicast Listener Discovery (MLD) snooping to manage IPV6 multicast traffic. Options are: • **Standard Mode:** Multicast traffic will flood to all bridge ports when no client subscribes to a multicast group even if IGMP snooping is enabled. • **Blocking Mode:** The multicast data traffic will be blocked and not flood to all bridge ports when there are no client subscriptions to any multicast group. This is the default.
Enable MLD LAN to LAN Multicast	(*Optional*) This option is *enabled* by default. It enables LAN-to-LAN Multicast until the first WAN service is connected. Options are **Disable** and **Enable**.

Ethernet Config

On the Ethernet Port Configuration page, you can set the speed and duplex mode for each of the Ethernet ports.

1. In the left navigation bar, click **Advanced Setup** > **Ethernet Config**. The following page appears.



Ethernet Port Configuration

Port	Configure	Current Bit Rate	Duplex Mode	Status
eth0/LAN1	Auto	100	Full	Up

** Always configure 1000BaseT connections with Auto.*

2. In the **Configure** column, select an option (**Auto**, **100 Full**, **100 Half**, **10 Full** or **10 Half**) for the Ethernet port on your gateway.

   These options represent 100 megabits or 10 megabits using half or full duplex transmission protocols. When you have a specific device with a known limited transmission speed capability, select one of the latter four options. If you select **Auto**, your gateway will automatically select an appropriate setting based on Ethernet auto negotiation with the NIC of the LAN host.

   Note: For 1000 BaseT connections, always select **Auto**.

3. Click **Save/Apply** to commit your changes.

NAT

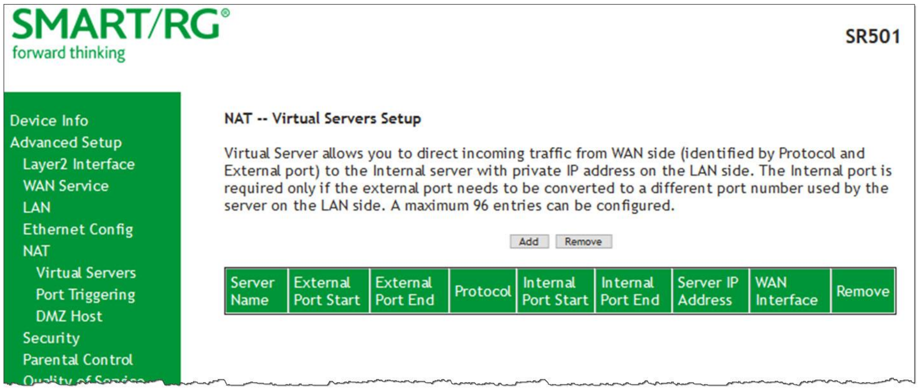
In this section, you can configure the settings for Network Address Translation including setting up virtual servers, port triggering and DMZ host. There is seldom need to customize these settings as the default settings manage the related features sufficiently for most environments.

Virtual Servers

Virtual Servers (more commonly known as port forwards) is a technique used to facilitate communications by external hosts with services provided within a private local area network.

On this page, you can configure the virtual server settings for your gateway.

1. In the left navigation bar, select **Advanced Setup > NAT**. The following page appears.

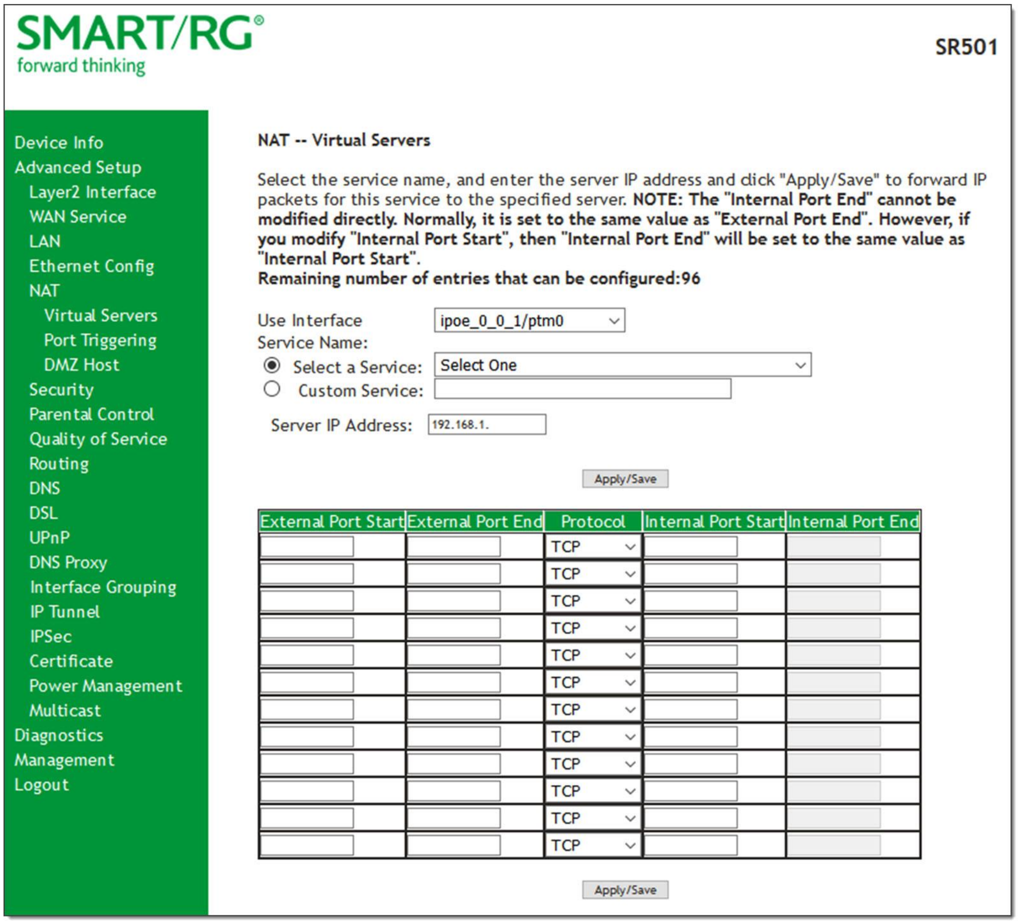


NAT -- Virtual Servers Setup

Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 96 entries can be configured.

Server Name	External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End	Server IP Address	WAN Interface	Remove

2. To add a virtual server, click **Add**. The following page appears.



NAT -- Virtual Servers

Select the service name, and enter the server IP address and click "Apply/Save" to forward IP packets for this service to the specified server. **NOTE: The "Internal Port End" cannot be modified directly. Normally, it is set to the same value as "External Port End". However, if you modify "Internal Port Start", then "Internal Port End" will be set to the same value as "Internal Port Start".**
Remaining number of entries that can be configured:96

Use Interface: ipoe_0_0_1/ptm0
Service Name:
● Select a Service: Select One
○ Custom Service:
Server IP Address: 192.168.1.

Apply/Save

External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		

Apply/Save

3. Customize the fields to create your port forwarding entry, using the information provided in the table below.
4. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

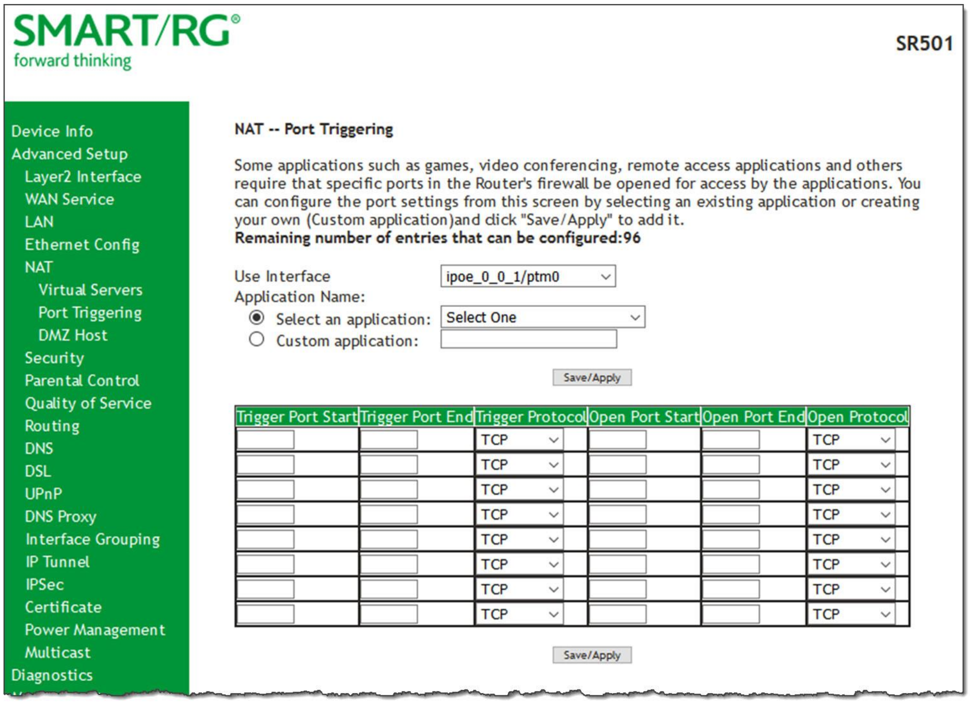
Field Name	Description
Use Interface	Select the WAN interface to which this NAT rule will apply.
Select a Service	Select from a list of application that typically require port forwards configured. The port ranges and protocol fields will be pre-populated.
Custom Service	If your application does not appear in the **Select a Service** list, you can enter a unique name for the application in this field.
Server IP	Enter the IP address of the LAN client where the service is hosted.

Field Name	Description
Address	
External Port Start	Enter the first external port for this server.
External Port End	Enter the last external port for this server.
Protocol	Select the protocol to be used with this range of ports. Options are: **TCP**, **UDP**, or **TCP/UDP**.
Internal Port Start	Enter the first internal port for this server.
Internal Port End	Enter the last internal port for this server.

Port Triggering

Some applications require that specific ports in the gateway's firewall be opened for access by remote parties. The Port Trigger feature dynamically opens up the open ports in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the triggering ports. The gateway allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the Open Ports.

1. In the left navigation bar, click Advanced Setup > NAT > Port Triggering and then click Add. The following page appears.



NAT -- Port Triggering

Some applications such as games, video conferencing, remote access applications and others require that specific ports in the Router's firewall be opened for access by the applications. You can configure the port settings from this screen by selecting an existing application or creating your own (Custom application)and click "Save/Apply" to add it.
Remaining number of entries that can be configured:96

Use Interface: ipoe_0_0_1/ptm0
Application Name:
● Select an application: Select One
○ Custom application:

Save/Apply

Trigger Port Start	Trigger Port End	Trigger Protocol	Open Port Start	Open Port End	Open Protocol
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP

Save/Apply

2. Customize the fields as needed for the firewall pinholes you wish to establish. A maximum 96 entries can be configured.
3. Click Save/Apply to commit your changes. If the selected service configures multiple servers, the same number of entries are added to the table of the NAT - Virtual Servers Setup page.

The fields on this page are explained in the following table.

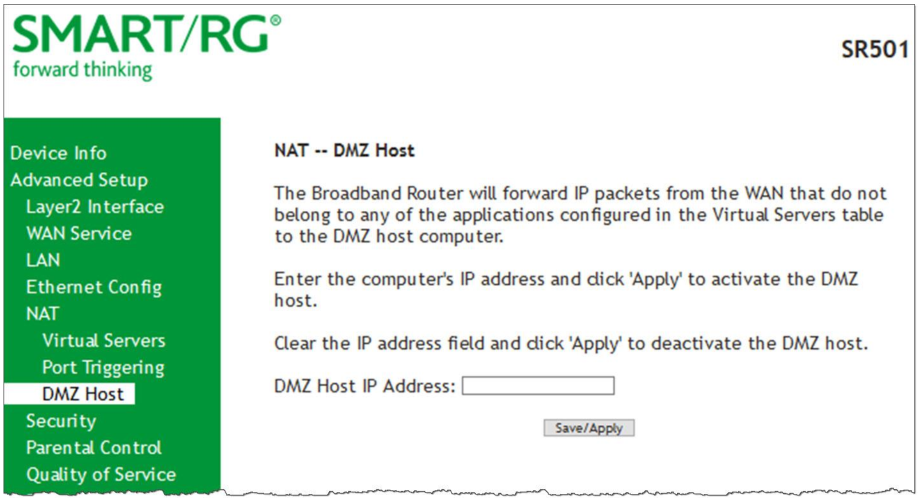
Field Name	Description
Use Interface	Select the interface for which the port triggering rule will apply.
Application Name	Select or enter the application which requires a port trigger entry. Options are: • **Select an application**: Select an application. The starting and ending IP addresses and port numbers that are configured for the service are populated into the table at the bottom of the page. • **Custom application**: If the application you want does not appear in the selection list, enter a unique name for the application for which you are creating a port trigger entry. This is a free-form text field.
Trigger Port Start	Enter the starting number of the range of available outgoing trigger ports. Options are: **1 - 65535.**
Trigger Port End	Enter the end number of the range of available outgoing trigger ports. Options are: **1 - 65535.**

Field Name	Description
Trigger Protocol	Select the protocol required by the application that will be using the ports in the specified range. Options are: **TCP**, **UDP**, and **TCP/UDP**.
Open Port Start	Enter the starting number of the range of available incoming ports. Options are: **1** - **65535**.
Open Port End	Enter the end number of the range of available incoming ports. Options are: **1** - **65535**.
Open Protocol	Select the protocol for the open port. Options are: **TCP**, **UDP**, and **TCP/UDP**.

DMZ Host

The Broadband Router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer. If you want to route all internet traffic to a specific LAN device with no filtering or security, add the IP address of that device to this page.

1. In the left navigation bar, click **Advanced Setup** > **NAT** > **DMZ Host**. The following page appears.



NAT -- DMZ Host

The Broadband Router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.

Enter the computer's IP address and click 'Apply' to activate the DMZ host.

Clear the IP address field and click 'Apply' to deactivate the DMZ host.

DMZ Host IP Address:

2. Enter the **DMZ Host IP Address**.
3. Click **Save/Apply** to commit your change.

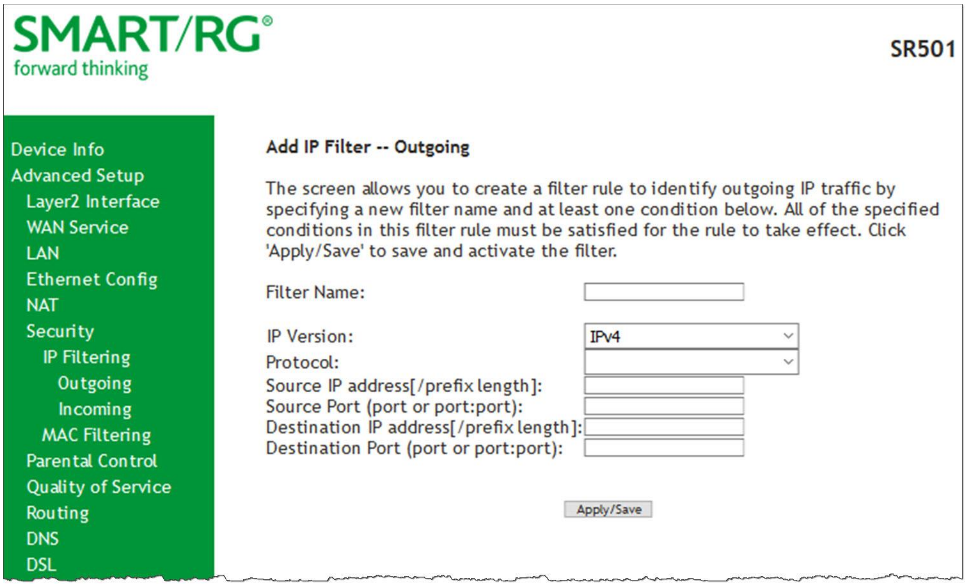
Security

In this section, you can configure filtering for IP and MAC addresses.

IP Filtering - Outgoing

On this page, you can add an outgoing filter when refusal of data transmitted from the LAN to the WAN is desired.

1. In the left navigation bar, click **Advanced Setup** > **Security** > **IP Filtering** and then click **Add**. The following page appears.



Add IP Filter -- Outgoing

The screen allows you to create a filter rule to identify outgoing IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click 'Apply/Save' to save and activate the filter.

Filter Name:

IP Version: IPv4

Protocol:

Source IP address[/prefix length]:

Source Port (port or port:port):

Destination IP address[/prefix length]:

Destination Port (port or port:port):

2. Fill in the fields, using the information in the table below.
3. Click **Apply/Save** to commit the completed entry.

The fields on this page are explained in the following table.

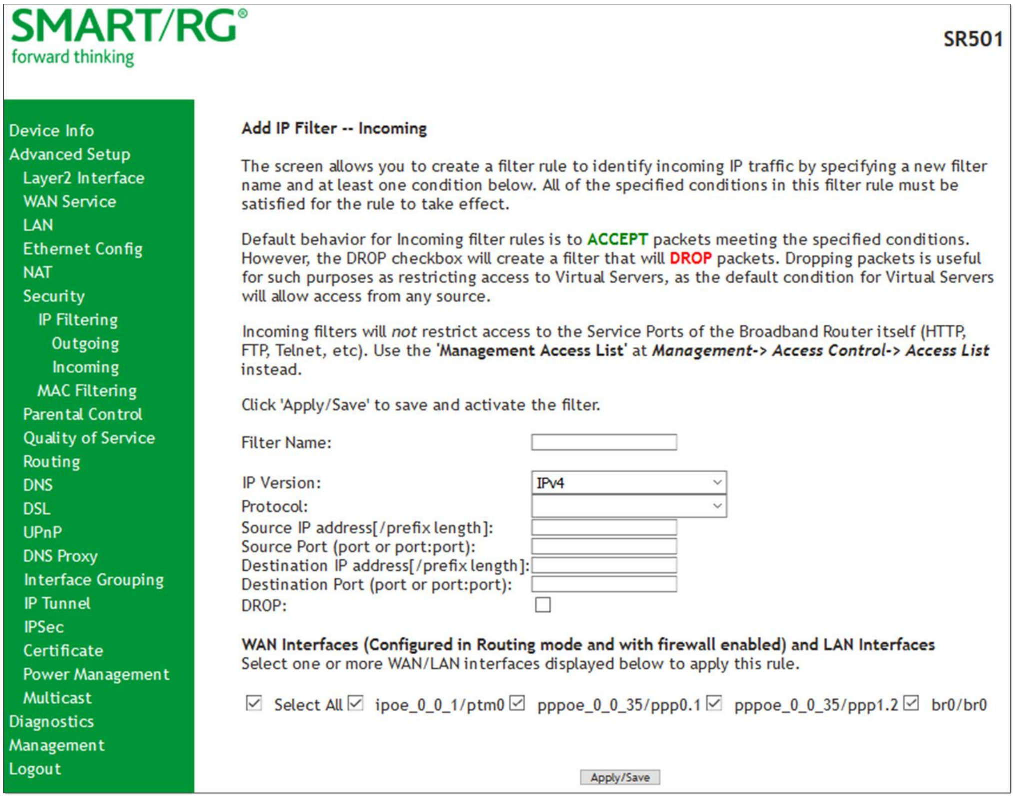
Field Name	Description
Filter Name	Enter a descriptive name for this filter.
IP Version	For the filter to be configured and effective for IPV6 , the gateway must be installed on a network that is either a IPV6-only network (with that protocol enabled) or is both IPV4 and IPV6 dual protocol enabled/configured. Options are **IPv4** and **IPv6**. The default is **IPv4**. If you select **IPV6**, both the Source and Destination IP address must be specified in IPV6 format. The following is an IPV6-compliant, hexadecimal address: 2001:0DB8:AC10:FE01:0000:0000:0000:0001.

Field Name	Description
Protocol	Select the protocol profile for the filter you are defining. TCP/UDP is most commonly used. The options are **TCP/UDP**, **TCP**, **UDP**, and **ICMP**.
Source IP address [/prefix length]	Enter the source IP address of a LAN side host for which you wish to filter/block outgoing traffic for the specified protocol(s). **Note:** This address can be a particular address or a block of IP addresses on a network subnet. This is done by appending the associated routing "/prefix" length decimal value (preceded with the slash) to the addresses. A valid decimal routing prefix is required for defining the subnet mask per CIDR notation.
Source Port (port or port:port)	Set the outgoing host port (or range of ports) for the above host (or range of hosts defined by optional routing "/prefix" subnet mask) to define the ports profile for which egress traffic will be filtered from reaching the specified destination(s).
Destination IP address	Enter the destination IP address of a LAN side host for which you wish to filter/block outgoing traffic for the specified protocols. **Note:** This address can be a particular address or a block of IP address on a network subnet. This is done by appending the associated routing "/prefix" length decimal value (preceded with the slash) to the addresses. A valid decimal routing prefix is required for defining the subnet mask per CIDR notation.
Destination Port (port or port:-port)	Set the destination host port (or range of ports) for the above host (or range of hosts) to define the destination port profile for which the filtered host egress traffic will be filtered from reaching the otherwise intended destination(s), e.g., to block the traffic to those ports on, say, a computer external to the local network.

IP Filtering - Incoming

On this page, you can add an incoming filter when refusal of data from the WAN to the LAN is desired.

1. In the left navigation bar, click Advanced Setup > Security > IP Filtering > Incoming and then click Add. The following page appears.



Add IP Filter -- Incoming

The screen allows you to create a filter rule to identify incoming IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect.

Default behavior for Incoming filter rules is to ACCEPT packets meeting the specified conditions. However, the DROP checkbox will create a filter that will DROP packets. Dropping packets is useful for such purposes as restricting access to Virtual Servers, as the default condition for Virtual Servers will allow access from any source.

Incoming filters will *not* restrict access to the Service Ports of the Broadband Router itself (HTTP, FTP, Telnet, etc). Use the '**Management Access List**' at ***Management-> Access Control-> Access List*** instead.

Click 'Apply/Save' to save and activate the filter.

Filter Name:	
IP Version:	IPv4
Protocol:	
Source IP address[/prefix length]:	
Source Port (port or port:port):	
Destination IP address[/prefix length]:	
Destination Port (port or port:port):	
DROP:	□

WAN Interfaces (Configured in Routing mode and with firewall enabled) and LAN Interfaces
Select one or more WAN/LAN interfaces displayed below to apply this rule.

☑ Select All ☑ ipoe_0_0_1/ptm0 ☑ pppoe_0_0_35/ppp0.1 ☑ pppoe_0_0_35/ppp1.2 ☑ br0/br0

2. Fill in the fields, using the information in the table below.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

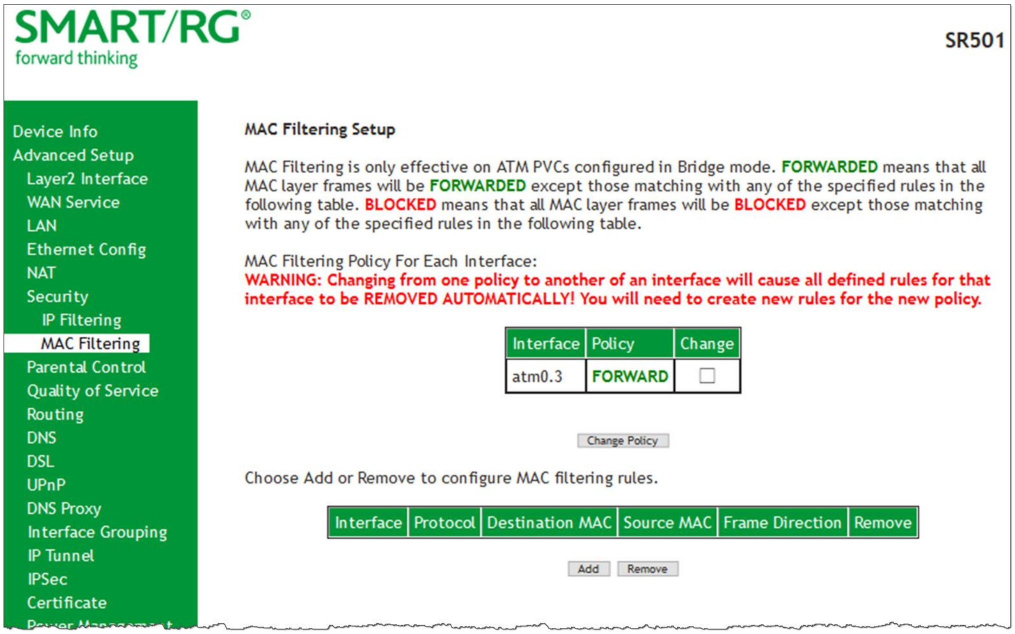
Field Name	Description
Filter Name	Enter a descriptive name for this filter.
IP Version	Select the IP version for this filter. Options are **IPv4** and **IPv6**. The default is **IPv4**.
Protocol	Select the protocol to be associated with this incoming filter. Options are **TCP/UDP**, **TCP**, **UDP**, or **ICMP**.
Source IP address [/prefix length]	Enter the source IP address for rule. For IPv6, enter the prefix as well.
Source Port (port or port:port)	Enter source port number or range (xxxxx:yyyyy).
Destination IP address [/prefix length]	Enter the destination IP address for rule. For IPv6, enter the prefix as well.
Destination Port (port or port:port)	Enter destination port number or range (xxxxx:yyyyy).
DROP	Select this option to drop packets that meet this filter's requirements. The packets are deleted.
WAN Interfaces	Click to apply this rule to all WAN interfaces or only certain types. Options are **Select All** or the interfaces defined for your network. The default is **Select All**.

MAC Filtering

Your SmartRG gateway can block or forward packets based on the originating device. This MAC filtering feature is available only in Bridge mode. For other modes, similar functionality is available via IP Filtering.

On this page, you can manage MAC filtering for your gateway.

1. In the left navigation bar, click **Advanced Setup** > **Security** > **MAC Filtering**. The following page appears.



MAC Filtering Setup

MAC Filtering is only effective on ATM PVCs configured in Bridge mode. **FORWARDED** means that all MAC layer frames will be **FORWARDED** except those matching with any of the specified rules in the following table. **BLOCKED** means that all MAC layer frames will be **BLOCKED** except those matching with any of the specified rules in the following table.

MAC Filtering Policy For Each Interface:
WARNING: Changing from one policy to another of an interface will cause all defined rules for that interface to be REMOVED AUTOMATICALLY! You will need to create new rules for the new policy.

Interface	Policy	Change
atm0.3	FORWARD	□

Choose Add or Remove to configure MAC filtering rules.

Interface	Protocol	Destination MAC	Source MAC	Frame Direction	Remove

2. To modify policy settings:
   a. Review the information on the page.
   b. Once you understand the consequences of changing the policy, click the **Change** checkbox, and then click **Change Policy**. The policy is switched to **FORWARD** or **BLOCKED**.
3. To add a rule, follow the instructions in "MAC Filtering".
4. To remove a rule, click the **Remove** checkbox next to the rule and click the **Remove** button.
5. When your changes are completed, click **Apply/Save** to commit your changes.

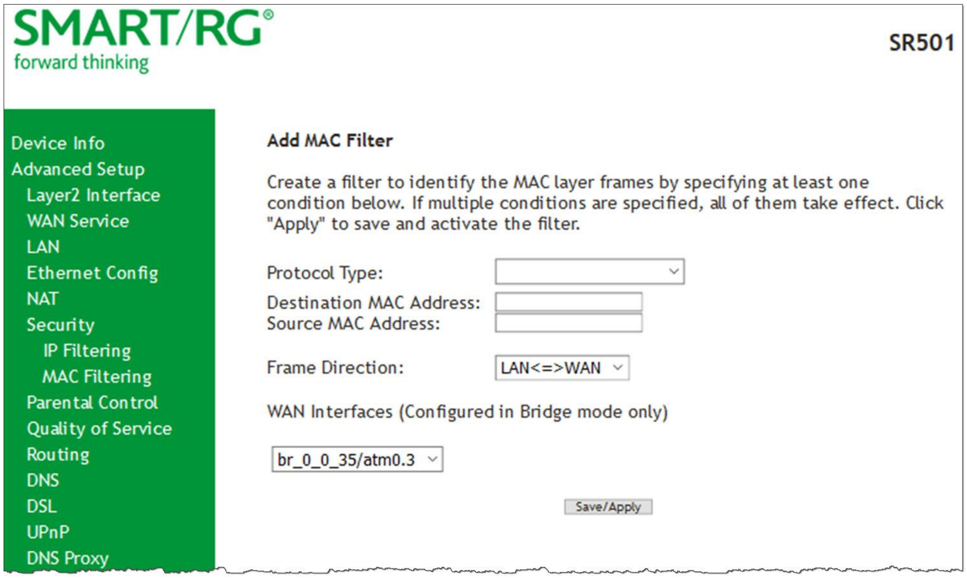
The fields on this page are explained in the following table.

Field Name	Description
Interface	The interface associated with an established policy rule.
Policy	The current/active policy type that is in place. Options are **FORWARD** and **BLOCKED**.

Adding a MAC Filtering Rule

You cannot edit rules but you can add new ones and then remove the obsolete ones.

1. On the MAC Filtering page, click **Add**. The following page appears.



Add MAC Filter

Create a filter to identify the MAC layer frames by specifying at least one condition below. If multiple conditions are specified, all of them take effect. Click "Apply" to save and activate the filter.

Protocol Type:

Destination MAC Address:

Source MAC Address:

Frame Direction: LAN<=>WAN

WAN Interfaces (Configured in Bridge mode only)

br_0_0_35/atm0.3

2. Fill in the fields, using the information provided in the following table.
3. Click **Save/Apply** to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
Protocol Type	Select the protocol associated with the device at the destination MAC address. Options are **PPPoE**, **IPv4**, **IPv6**, **AppleTalk**, **IPX**, **NetBEUI**, and **IGMP**.
Destination MAC Address	Enter the MAC address of the hardware you wish to associate with this filter.
Source MAC Address	Enter the MAC address of the device that is originating requests intended for the device associated with the **Destination MAC Address**.
Frame Direction	Select the incoming/outgoing packet interface. Options are **LAN<=>WAN**, **WAN=>LAN**, and **LAN=>WAN**. The default is **LAN<=>WAN**.
WAN Interfaces	Select the interface to which the filter should be applied.

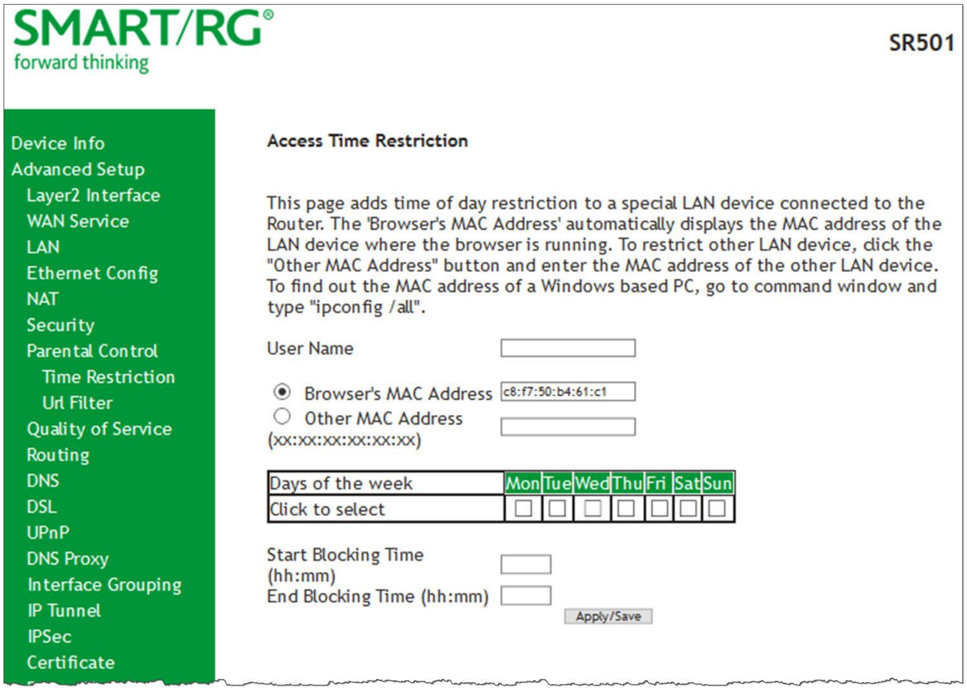
Parental Control

In this section, you can configure the Parental Control features of your SmartRG gateway to restrict Internet access to certain hours and to certain URLS.

Time Restriction

On this page, you can restrict Internet access to particular days and specific times for each device that accesses your gateway.

1. In the left navigation bar, click **Advanced Setup** > **Parental Control** and then click **Add**. The following page appears.



Access Time Restriction

This page adds time of day restriction to a special LAN device connected to the Router. The 'Browser's MAC Address' automatically displays the MAC address of the LAN device where the browser is running. To restrict other LAN device, click the "Other MAC Address" button and enter the MAC address of the other LAN device. To find out the MAC address of a Windows based PC, go to command window and type "ipconfig /all".

User Name

● Browser's MAC Address c8:f7:50:b4:61:c1
○ Other MAC Address
(xx:xx:xx:xx:xx:xx)

Days of the week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Click to select	□	□	□	□	□	□	□

Start Blocking Time (hh:mm)
End Blocking Time (hh:mm)

2. Fill in the fields using the information in the table below.
3. Click **Apply/Save**.

The fields on this page are explained in the following table.

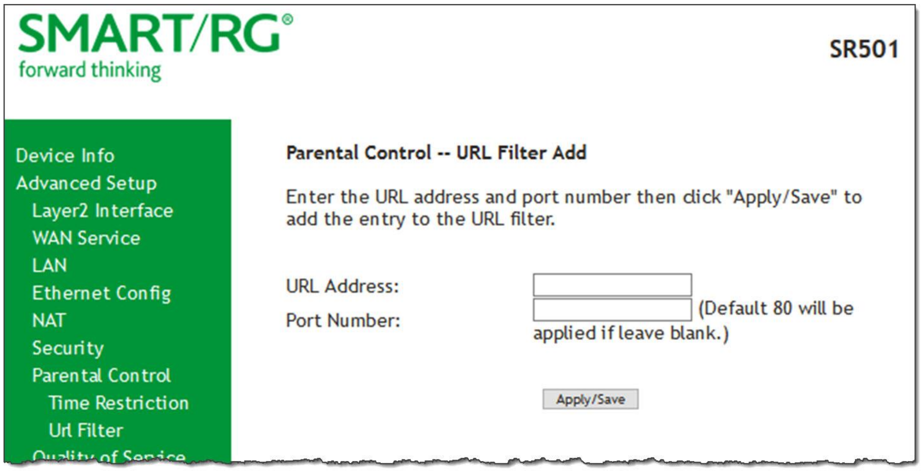
Field Name	Description
User Name	Enter a descriptive name for this restriction.
Browser's MAC Address	This option is selected by default. The MAC address of the connected device is shown.
Other MAC Address	Select this option to restrict access to another device. Enter the MAC address of that device. **Note:** You can view a list of the connected devices and MAC addresses on the **Device Info** > **ARP** page.
Days of the week	Select the days **(Mon - Sun**) for which the restrictions apply.
Start Time Blocking / End Time Blocking	Enter the range of time that the devices listed above are restricted from access to the Internet. Use 24-hour clock notation (**00:00 - 24:00**).

URL Filter

The other side of the Parental Controls coin is URL filtering. On this page, you can exclude and include URLs as desired. Each list can include up to 100 addresses.

Note: Only one **Exclude** list and one **Include** list are supported for each gateway. Unique lists are not supported for connecting devices.

1. In the left navigation bar, click **Advanced Setup** > **Parental Control** > **Url Filter**.
2. To block a URL:
   a. Next to **URL List Type**, select **Exclude**.
   b. Click **Add**. The following page appears.



Parental Control -- URL Filter Add

Enter the URL address and port number then click "Apply/Save" to add the entry to the URL filter.

URL Address:
Port Number: (Default 80 will be applied if leave blank.)

   c. Click **Apply/Save** to save your settings. You are returned to the Url Filter page.
3. To create a list of URLs to allow, next to **URL List Type**, select **Include** and repeat the above steps.

The fields on this page are explained in the following table.

Field Name	Description
URL Address	Enter the URL address to be included in the list.
Port Number	(*Optional*) Enter the port number associated with the URL. The default is **80**.

Quality Of Service

Quality of Service (QoS) enables prioritization of Internet content to help ensure the best possible performance. This is particularly useful for streaming video and audio content with minimized potential for drop-outs. QoS becomes significant when the sum of all traffic (audio, vid"QoS Classification"data) exceeds the capacity of the line.

In this section, you can configure QoS settings including traffic queues, classifications (rules) and port shaping.

Note: Before proceeding, make sure that the necessary WAN service has been configured with the appropriate Priority setting.

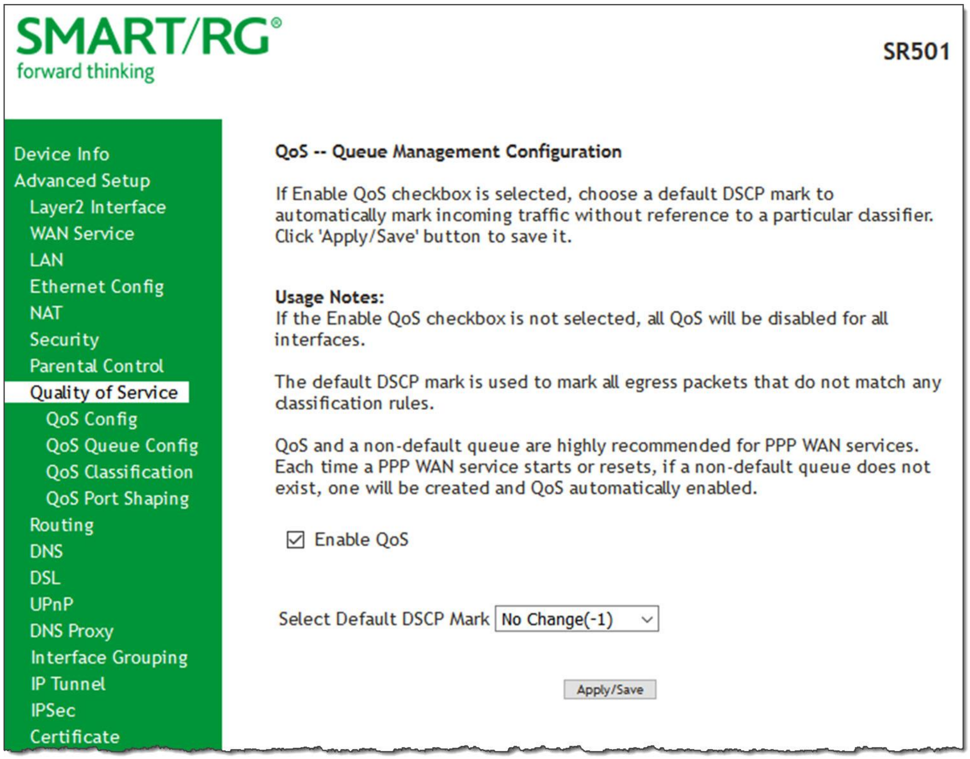
QoS Config

On this page, you can enable QoS and set the DSCP Mark classification.

The maximum number of queues that can be configured vary by mode, as shown below.

Mode	Maximum # of queues
ATM	16
Ethernet	4 per interface
PTM	8

1. In the left navigation bar, click **Advanced Setup** > **Quality Of Service** > **QoS Config**. The following page appears.



QoS -- Queue Management Configuration

If Enable QoS checkbox is selected, choose a default DSCP mark to automatically mark incoming traffic without reference to a particular classifier. Click 'Apply/Save' button to save it.

Usage Notes:
If the Enable QoS checkbox is not selected, all QoS will be disabled for all interfaces.

The default DSCP mark is used to mark all egress packets that do not match any classification rules.

QoS and a non-default queue are highly recommended for PPP WAN services. Each time a PPP WAN service starts or resets, if a non-default queue does not exist, one will be created and QoS automatically enabled.

☑ Enable QoS

Select Default DSCP Mark: No Change(-1)

2. If the **Enable QoS** checkbox is *not* checked, click it to select it.
   Warning: If this option is already enabled and you clear the checkbox, QoS will be disabled for ALL interfaces.
3. In the **Select Default DSCP Mark** field, select the Differentiated Services Code Point (DSCP) Mark classification value to be used. The default is **No Change(-1)**. For a list of supported values, see "Supported DSCP Values".
4. Click **Apply/Save** to save your settings.

Supported DSCP Values

The DSCP marking QoS Queue Management Configuration marking on ingress packets is based on the selection you make in the **Select Default DSCP Mark** field. The selected default marking is applied automatically to all incoming packets without reference to a particular classification.

Note: A default DSCP mark value of **Default(000000)** will mark all egress packets that do NOT match any classification.

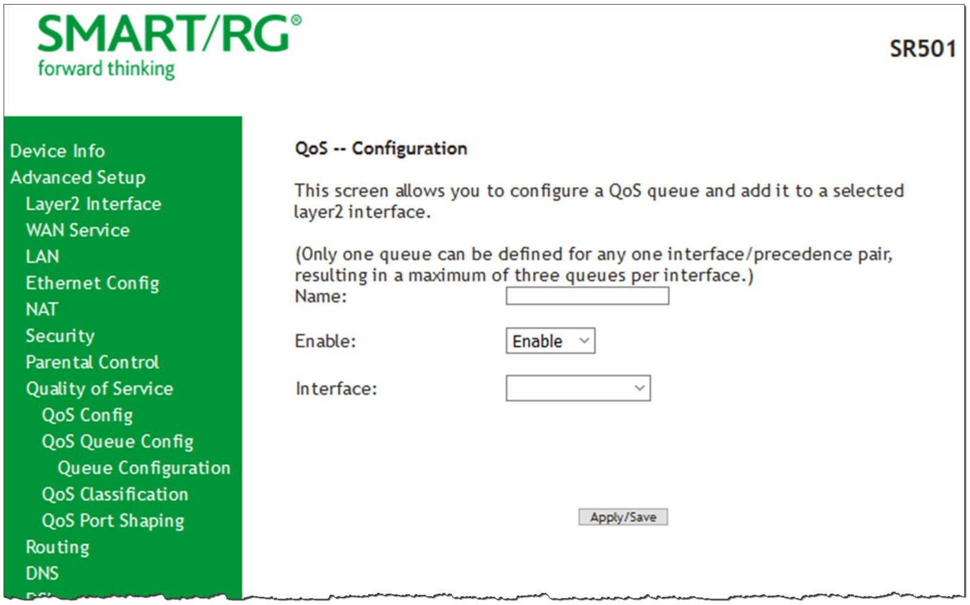
The following values are supported. For more information about commonly used DSCP values, refer to RFC 2475.

No Change(-1)	CS1(001000)	AF32(011100)	CS4(100000)
Auto Marking(-2)	AF23(010110)	AF31(011010)	EF(101110)
Default(000000)	AF22(010100)	CS3(011000)	CS5(101000)
AF13(001110)	AF21(010010)	AF43(100110)	CS6(110000)
AF12(001100)	CS2(010000)	AF42(100100)	CS7(111000)
AF11(001010)	AF33(011110)	AF41(100010)	

QoS Queue Config

On this page, you can configure a queue and add it to a Layer2 interface.

1. In the left navigation bar, click **Advanced Setup** > **Quality Of Service** > **QoS Queue Config** and then click **Add**. The following page appears.



QoS -- Configuration

This screen allows you to configure a QoS queue and add it to a selected layer2 interface.

(Only one queue can be defined for any one interface/precedence pair, resulting in a maximum of three queues per interface.)

Name:

Enable: Enable

Interface:

2. In the **Name** field, type a descriptive name for this queue.
3. In the **Interface** field, select the Layer 2 interface to be associated for this queue. Additional fields appear.

4. Fill in the fields, using the information provided in the table below.
   Note: For Dynamic WAN interfaces, the queue priority settings appear - once for each WAN configuration.
5. Click **Apply/Save** to save your settings.

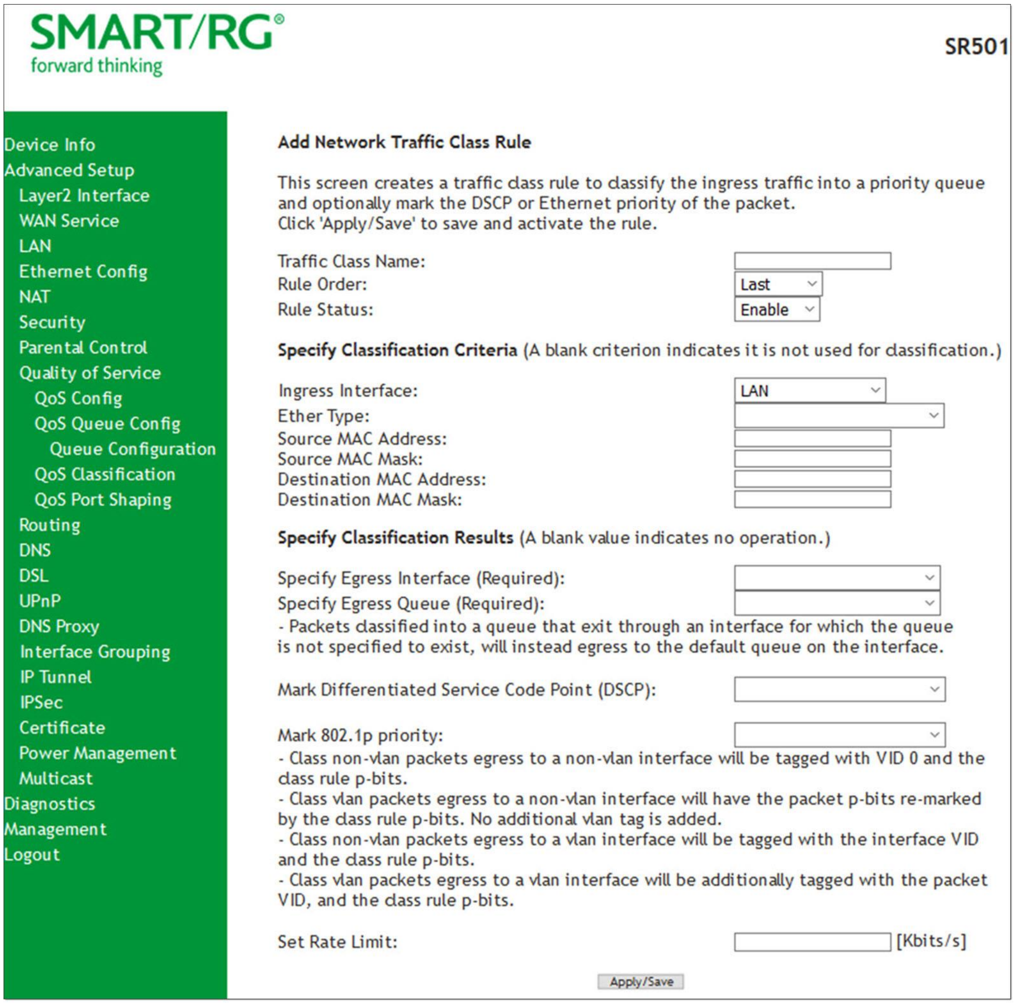
The fields on this page are explained in the following table.

Field Name	Description
Enable	Select to enable or disable this queue configured on the selected interface. This option is *enabled* by default. **Note:** Only one queue can be defined for any one interface/precedence pair, resulting in a maximum of three queues per interface.
Queue Priority settings	
Precedence	Select the priority value to be associated with the new queue. Options vary by interface type and include **1(SP - 4(SP)**, **1(WRR/WFQ) - 7(WRR/WFQ)**, and **8(WRR)**. **Note:** The lower the value, the higher the priority.
Scheduler Algorithm	(*Not applicable for ETH interfaces*) Select an algorithm for applying queue data priority. Options are: • **Strict Priority:** Applies weighting based on the **Priority** field value. • **Weighted Round Robin:** Applies a fair round robin scheme weighting that is effective for networks with fixed packet sizes, e.g., ATM networks. • **Weighted Fair Queuing:** Applies a fair queue weighting scheme by allowing different sessions to have different service shares for improved data packet flow in networks with variable packet sizes, e.g., PTM/IP networks.
Queue Weight	(*Not applicable for ETH interfaces*) Enter a weight for prioritizing this queue. Options are **1** - **63**.
Minimum Rate	(*Applicable for PTM and Dynamic WAN interfaces only*) Enter the minimum shaping rate for packets in QoS queues. Options are **1** - **1255** kbps. To specify no minimum rate, enter **-1**.
Shaping Rate	(*Applicable for PTM and Dynamic WAN interfaces only*) Enter the shaping rate for packets in QoS queues. Options are **1** - **1255** kbps. To specify no shaping, enter **-1** .
Shaping Burst Size	(*Applicable for PTM and Dynamic WAN interfaces only*) Enter the shaping burst size to be applied to packets in the defined queue. Options are **1600 bytes** or greater.
PTM Priority	(*Applicable for PTM and Dynamic WAN interfaces only*) Select the priority for the PTM interface. Options are **Low** and **High**.

QoS Classification

On this page, you can create traffic class rules for classifying the ingress traffic into a priority queue. You can also mark the DSCP or Ethernet priority of the packet.

1. In the left navigation bar, click **Advanced Setup** > **Quality Of Service** > **QoS Classification** and then click **Add**. The following page appears. A maximum of 32 entries can be configured.



Add Network Traffic Class Rule

This screen creates a traffic class rule to classify the ingress traffic into a priority queue and optionally mark the DSCP or Ethernet priority of the packet.
Click 'Apply/Save' to save and activate the rule.

Traffic Class Name:	
Rule Order:	Last
Rule Status:	Enable

Specify Classification Criteria (A blank criterion indicates it is not used for classification.)

Ingress Interface:	LAN
Ether Type:	
Source MAC Address:	
Source MAC Mask:	
Destination MAC Address:	
Destination MAC Mask:	

Specify Classification Results (A blank value indicates no operation.)

Specify Egress Interface (Required):
Specify Egress Queue (Required):
- Packets classified into a queue that exit through an interface for which the queue is not specified to exist, will instead egress to the default queue on the interface.

Mark Differentiated Service Code Point (DSCP):

Mark 802.1p priority:
- Class non-vlan packets egress to a non-vlan interface will be tagged with VID 0 and the class rule p-bits.
- Class vlan packets egress to a non-vlan interface will have the packet p-bits re-marked by the class rule p-bits. No additional vlan tag is added.
- Class non-vlan packets egress to a vlan interface will be tagged with the interface VID and the class rule p-bits.
- Class vlan packets egress to a vlan interface will be additionally tagged with the packet VID, and the class rule p-bits.

Set Rate Limit: [Kbits/s]

2. Fill in the fields, using the information in the table below.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

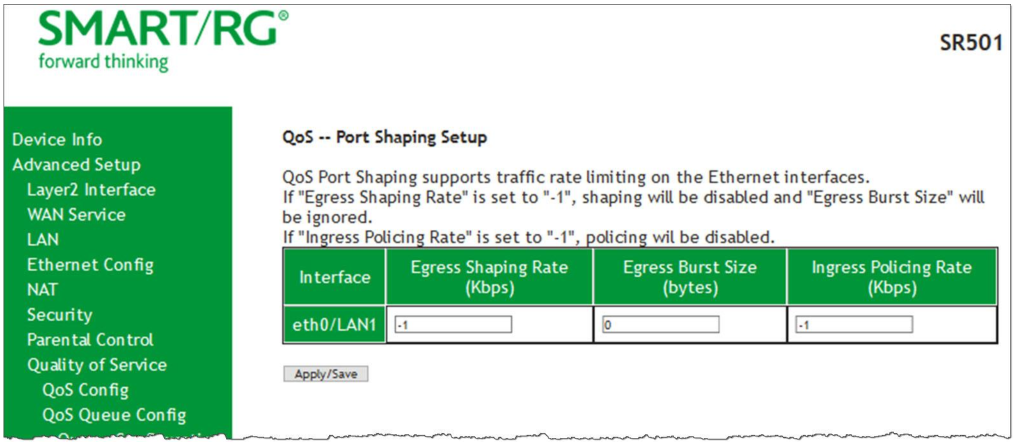
Field Name	Description
Traffic Class Name	Enter a descriptive name for this rule. This is a free-form text field.
Rule Order	Select whether this rule is processed last in the list of classification rules. The only option is **Last.**
Rule Status	Select whether this rule is active or inactive. Options are **Disable** and **Enable**.The default is **Enable**.
Specify Classification Criteria section	
Ingress Interface	Select an interface for incoming data. Options are **LAN**, **WAN**, **Local** and any interface already configured for your gateway.
Ether Type	Select the Ethernet interface type for this classification. Options are **IP**, **ARP**, **IPV6**, **PPPoE_DISC**, **pPPoE_SES**, **8865**, **8866**, and **8021Q.**
802.1P priority	(*For **Ether Type** of **8021Q** only*) This value is inserted into the Ethernet frame and used to differentiate traffic. Lower values assign higher priorities. Options are: **1** - **7**.
Source MAC Address Source MAC Mask	(*Not applicable for **Ether Type** of **8021Q***) Enter the source MAC Address and Source MAC Mask for this classification.
Destination MAC Address Destination MAC Mask	(*Not applicable for **Ether Type** of **8021Q***) Enter the destination MAC Address and destination MAC Mask for this classification.
Source IP Address[Mask]	(*Not applicable for **Ether Type** of **8021Q***) (Optional) Enter the source IP address and subnet mask for this classification, or select a DHCP option from the drop-down list and enter the address and mask for that server.
Destination IP Address [Mask]	(*Optional*) (*Not applicable for **Ether Type** of **8021Q***) Enter the destination IP address and subnet mask for this classification.
Differentiated Service Code Point (DSCP) Check	(*Optional*) (*Not applicable for **Ether Type** of **8021Q***) Select the desired DSCP code for marking incoming data.
Protocol	(*Optional*) (*Not applicable for **Ether Type** of **8021Q***) Enter the Protocol specified for this classification.
Specify Class Queue	(*Not applicable for **Ether Type** of **8021Q***) Select from the available queues. **Note:** Make sure to select a queue that is configured for the interface that you selected. If you select a queue that is not configured for the selected interface, any packets classified into that queue are processed by the default queue for the interface.
Specify Classification Results section	
Specify Egress Interface	Select the egress interface for this rule. Options are the interfaces already configured.

Field Name	Description
Specify Egress Queue	Select the egress queue for this rule. Options are the queues already configured.
Mark Applied Differentiated Service Code Point	Select the desired DSCP code for marking classification results.
802.1P priority	This value is inserted into the Ethernet frame and used to differentiate traffic. Lower values assign higher priorities. Options are: **1** - **7**.
Set Rate Limit	Enter the data traffic rate limit (in Kbps) applied for this classification.

QoS Port Shaping

QoS Port Shaping facilitates setting a fixed rate (Kbps) for each of the Ethernet ports.

1. In the left navigation bar, click **Advanced Setup** > **Quality Of Service** > **QoS Port Shaping**. The following page appears.



QoS -- Port Shaping Setup

QoS Port Shaping supports traffic rate limiting on the Ethernet interfaces.
If "Egress Shaping Rate" is set to "-1", shaping will be disabled and "Egress Burst Size" will be ignored.
If "Ingress Policing Rate" is set to "-1", policing wil be disabled.

Interface	Egress Shaping Rate (Kbps)	Egress Burst Size (bytes)	Ingress Policing Rate (Kbps)
eth0/LAN1	-1	0	-1

2. Fill in the fields, using the information in the table below.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
Interface	Each entry in this column represents one of the Ethernet LAN ports on the gateway.
Shaping Rate (Kbps)	Enter the data rate for packets on the specified Interface. Options are: **1** - **1,000,000** Kbps. The default is **-1** (no shaping).
Burst Size (bytes)	Enter the burst size to be applied to packets in the defined queue. Options are **1600 bytes** or greater.

Field Name	Description
	If you enter a value of **-1** (disabled) in the **Shaping Rate** field, the value in this field is ignored.
Egress Shaping Rate (Kbps)	Enter the data rate for packets on the specified Interface. Options are: **1** - **1,000,000** Kbps. The default is **-1** (no shaping).
Egress Burst Size (bytes	Enter the burst size to be applied to packets in the defined queue. Options are **1600 bytes** or greater. The default is **0** (no size limit). If you enter a value of **-1** (disabled) in the **Egress Shaping Rate** field, the value in this field is ignored.
Ingress Policing Rate (Kbps)	Enter data rate for policing incoming packets in the defined queue. The default is **-1** (no policing).

Routing

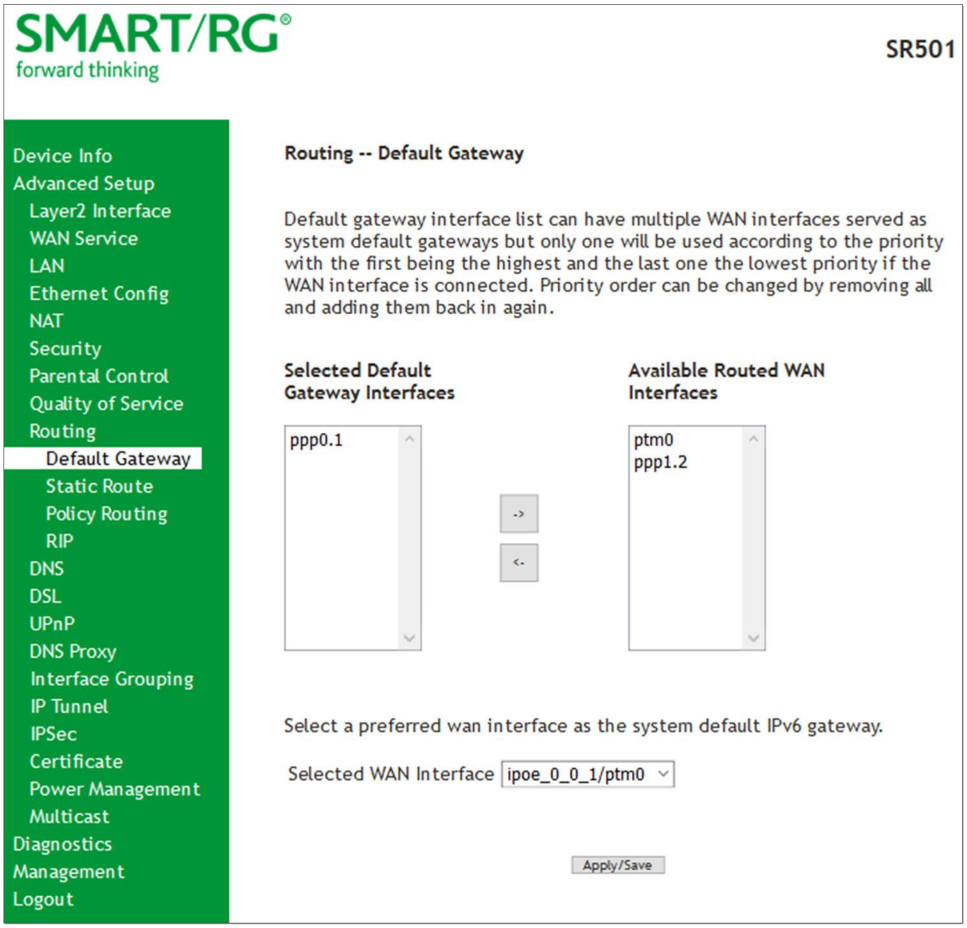
In this section, you can configure default gateways, static routing, policy routing and RIP settings.

Default Gateway

On this page, you can configure the default gateway interface list to establish access priority, that is, interfaces are accessed in the order listed in the **Selected Default Gateway Interfaces** column.

Note: You must configure the IPv6 interface before attempting to assign it as the default gateway interface.

1. In the left navigation bar, select **Advanced Setup** > **Routing**. The following page appears.



Routing -- Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Selected Default Gateway Interfaces	Available Routed WAN Interfaces
ppp0.1	ptm0 ppp1.2

Select a preferred wan interface as the system default IPv6 gateway.

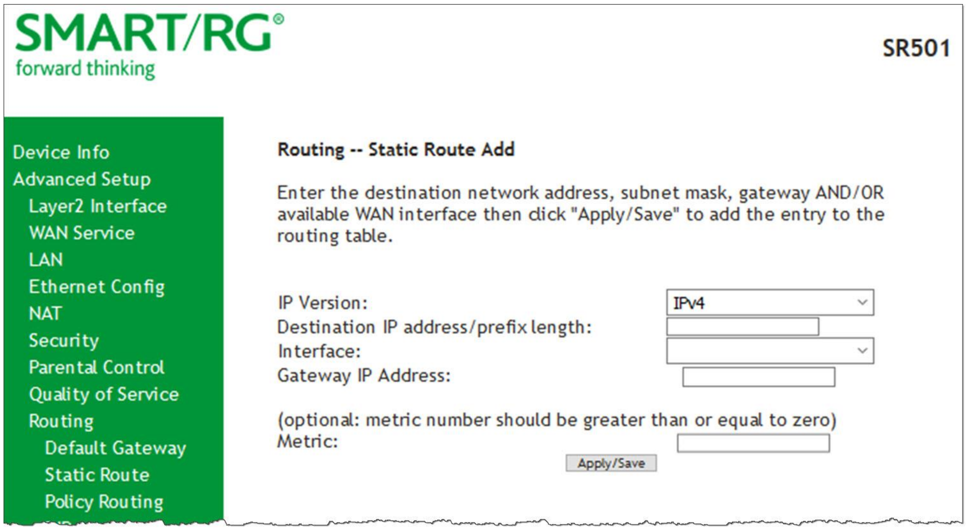
Selected WAN Interface: ipoe_0_0_1/ptm0

2. Select the interfaces that you want used as default gateway interfaces. Click the **arrows** to move your selection between the columns. Move the highest priority interface first, followed by the next highest priority interface, and so on.
3. (*Optional*) In the **Selected WAN Interface** field, select an IPv6 interface.
4. Click **Apply/Save** to commit your changes.

Static Route

On this page, you can configure static routes for your network. A static route is a manually configured, fixed route for IP data. You can enter a maximum of 32 entries.

1. In the left navigation bar, click **Advanced Setup** > **Routing** > **Static Route** and then click **Add**. The following page appears.



Routing -- Static Route Add

Enter the destination network address, subnet mask, gateway AND/OR available WAN interface then click "Apply/Save" to add the entry to the routing table.

IP Version: IPv4
Destination IP address/prefix length:
Interface:
Gateway IP Address:

(optional: metric number should be greater than or equal to zero)
Metric:

2. Fill in the fields, using the information in the table below.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

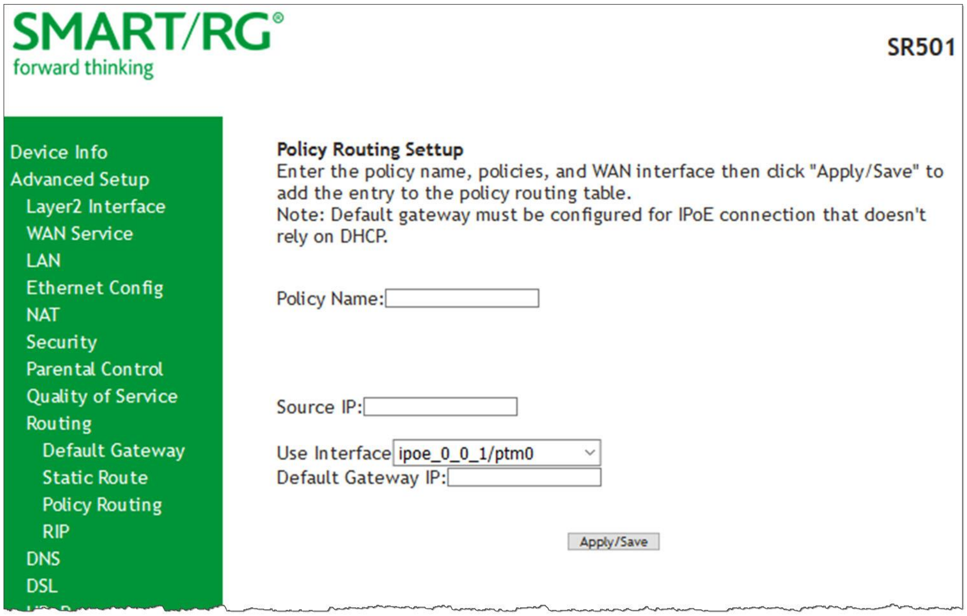
Field Name	Description
IP Version	Select the IP version associated with the static route you wish to create. Options are: **IPv4** and **IPv6**.
Destination IP address/ prefix length	Enter the destination network address / subnet mask for route.
Interface	Select the WAN Interface for this route. This list filtered by the selected IP version.
Gateway IP Address	Enter the destination IP address for this route. If needed, include the /prefix length.
Metric	(*Optional*) Establishes traffic priority/weighting. Must be equal to or greater than **zero** (≥ 0).

Policy Routing

Policy routing makes somewhat automated routing choices based on policies defined by a network administrator. For example, a network administrator might want to deviate from standard routing based on destination markers in the packet and, instead, forward a packet based on the source address.

On this page, you can configure similar policies.

1. In the left navigation bar, click Advanced Setup > Routing > Policy Routing and then click Add. The following page appears.



Policy Routing Setup
Enter the policy name, policies, and WAN interface then click "Apply/Save" to add the entry to the policy routing table.
Note: Default gateway must be configured for IPoE connection that doesn't rely on DHCP.

Policy Name:

Source IP:

Use Interface ipoe_0_0_1/ptm0
Default Gateway IP:

2. Fill in the fields, using the information in the table below.
3. Click Apply/Save to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
Policy Name	Enter a descriptive name for this entry to the policy routing table.
Source IP	Enter the IP address for the source of this policy route.
Use Interface	Select the WAN Interface for this policy route.
Default Gateway IP	Enter the IP address of the default gateway.

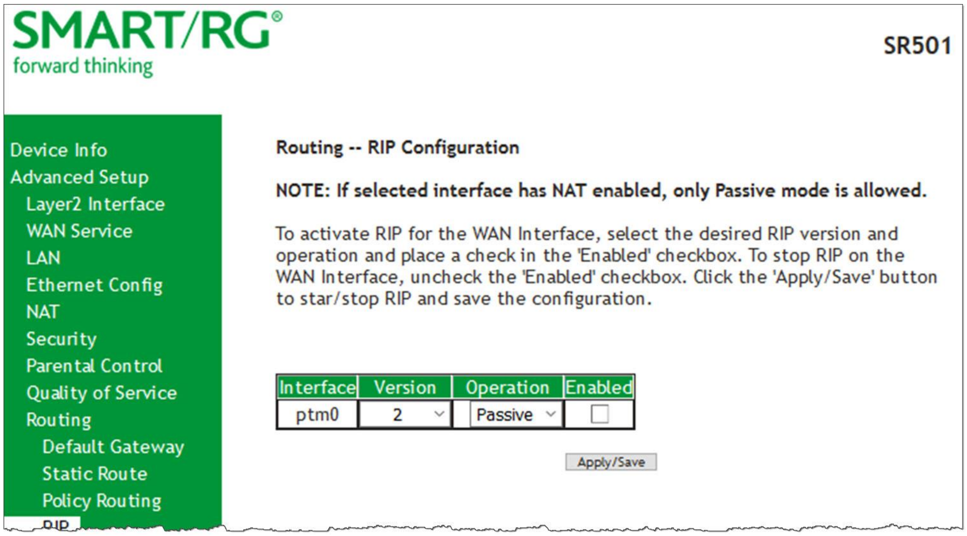
RIP (Routing Information Protocol)

RIP is a type of distance-vector routing protocol, which leverages hop count as a metric for routing. RIP puts a limit on the number of hops (maximum of 15) allowed in order to prevent routing loops. This can sometimes limit the size of networks where RIP can be successfully employed.

Note: This feature applies only to IPoE configurations.

On this page, you can configure the RIP settings.

1. In the left navigation bar, click **Advanced Setup** > **Routing** > **RIP,** and then click **Add**. The following page appears.



Routing -- RIP Configuration

NOTE: If selected interface has NAT enabled, only Passive mode is allowed.

To activate RIP for the WAN Interface, select the desired RIP version and operation and place a check in the 'Enabled' checkbox. To stop RIP on the WAN Interface, uncheck the 'Enabled' checkbox. Click the 'Apply/Save' button to star/stop RIP and save the configuration.

Interface	Version	Operation	Enabled
ptm0	2	Passive	□

2. Fill in the fields, using the information in the table below.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
Interface	Displays a list of available WAN interfaces. Complete the line item(s) associated with the interface where you wish to employ RIP.
Version	Select the version of Routing Interface Protocol you desire. Reference RFC 1058 and RFC 1453 for detailed information on RIP versions. Options are: **1**, **2**, and **Both**.
Operation	Select the operation mode. Options are: • **Active:** This mode listens and advertises routes. • **Passive:** This mode listens only. It does not advertise routes.
Enabled	Select to employ RIP on the displayed interface.

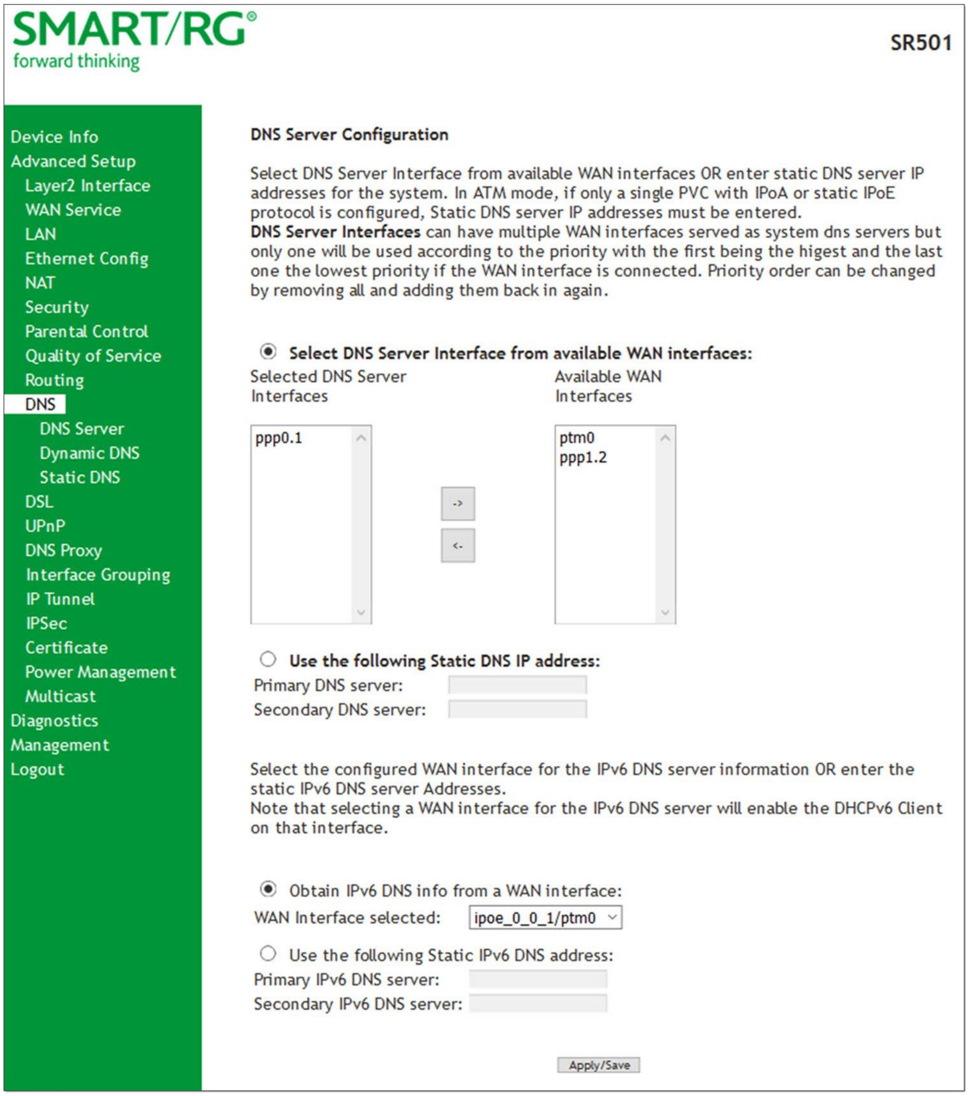
DNS

In this section, you can configure a DNS server, dynamic DNS and static DNS.

DNS Server

On this page, you can input the Domain Name Server (DNS) information supplied by your service provider.

1. In the left navigation bar, click **Advanced Setup** > **DNS**. The following page appears.



DNS Server Configuration

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.
DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

● **Select DNS Server Interface from available WAN interfaces:**

Selected DNS Server Interfaces	Available WAN Interfaces
ppp0.1	ptm0 ppp1.2

○ **Use the following Static DNS IP address:**

Primary DNS server:

Secondary DNS server:

Select the configured WAN interface for the IPv6 DNS server information OR enter the static IPv6 DNS server Addresses.
Note that selecting a WAN interface for the IPv6 DNS server will enable the DHCPv6 Client on that interface.

● Obtain IPv6 DNS info from a WAN interface:

WAN Interface selected: ipoe_0_0_1/ptm0

○ Use the following Static IPv6 DNS address:

Primary IPv6 DNS server:

Secondary IPv6 DNS server:

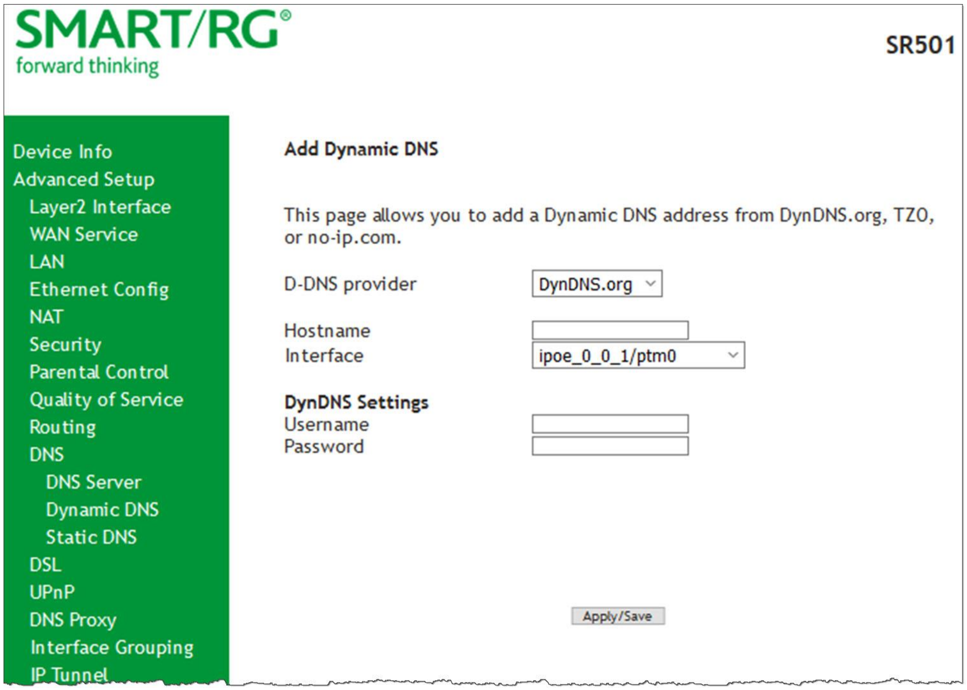
2. (*Optional*) Select DNS Server interfaces by moving them from left to right or right to left by clicking the arrows. The options for obtaining the DNS information from a WAN interface are selected by default.

3. To use a static DNS IP address, click **Use the following Static DNS IP address** and enter the primary DNS IP address. If applicable, enter a secondary DNS IP address.
4. (*Optional*) In the **WAN Interface selected** field, select a different WAN interface.
   The **Obtain IPv6 DNS info from a WAN interface** option is selected by default.
5. To use a static DNS IPv6 address, click **Use the following Static IPv6 DNS address** and enter the primary DNS IP address. If applicable, enter a secondary DNS IP address.
6. Click **Apply/Save** to commit changes.

Dynamic DNS

Dynamic DNS (DDNS) automatically updates a name server in the DNS with the active DNS configuration of its configured hostnames, addresses or other data. Often this update occurs in real time. On this page, you can configure the settings for this feature.

1. In the left navigation bar, click **Advanced Setup** > **DNS** > **Dynamic DNS** and then click **Add**. The following page appears.



Add Dynamic DNS

This page allows you to add a Dynamic DNS address from DynDNS.org, TZO, or no-ip.com.

D-DNS provider DynDNS.org

Hostname

Interface ipoe_0_0_1/ptm0

DynDNS Settings

Username

Password

2. Modify the settings, using the information provided in the following table.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

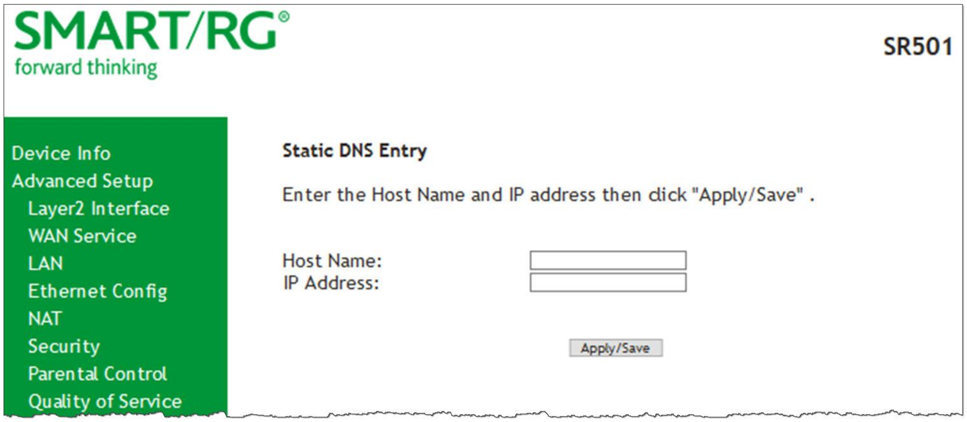
Field Name	Description
D-DNS provider	Select a dynamic Domain Name Server provider.
Hostname	Enter the hostname of the dynamic DNS server.

Field Name	Description
Interface	Select the gateway WAN interface whose traffic will be pointed at the specified Dynamic DNS provider.
DynDNS.org settings	
Username	Enter the username for the dynamic DNS server .
Password	Enter the password for the dynamic DNS server.
TZO and **no-ip** settings	
Email	Enter the email use to access TZO.
Key	Enter the key for your TZO account.

Static DNS

The Static DNS service allows you to resolve DNS queries on the Broadband Router by adding a static host name to the IP Address mappings. On this page, you can configure up to 10 static DNS entries.

1. In the left navigation bar, click **Advanced Setup** > **DNS** > **Static DNS** and then click **Add**. The following page appears.



Static DNS Entry

Enter the Host Name and IP address then click "Apply/Save" .

Host Name:
IP Address:

2. Modify the settings, using the information provided in the following table.
3. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

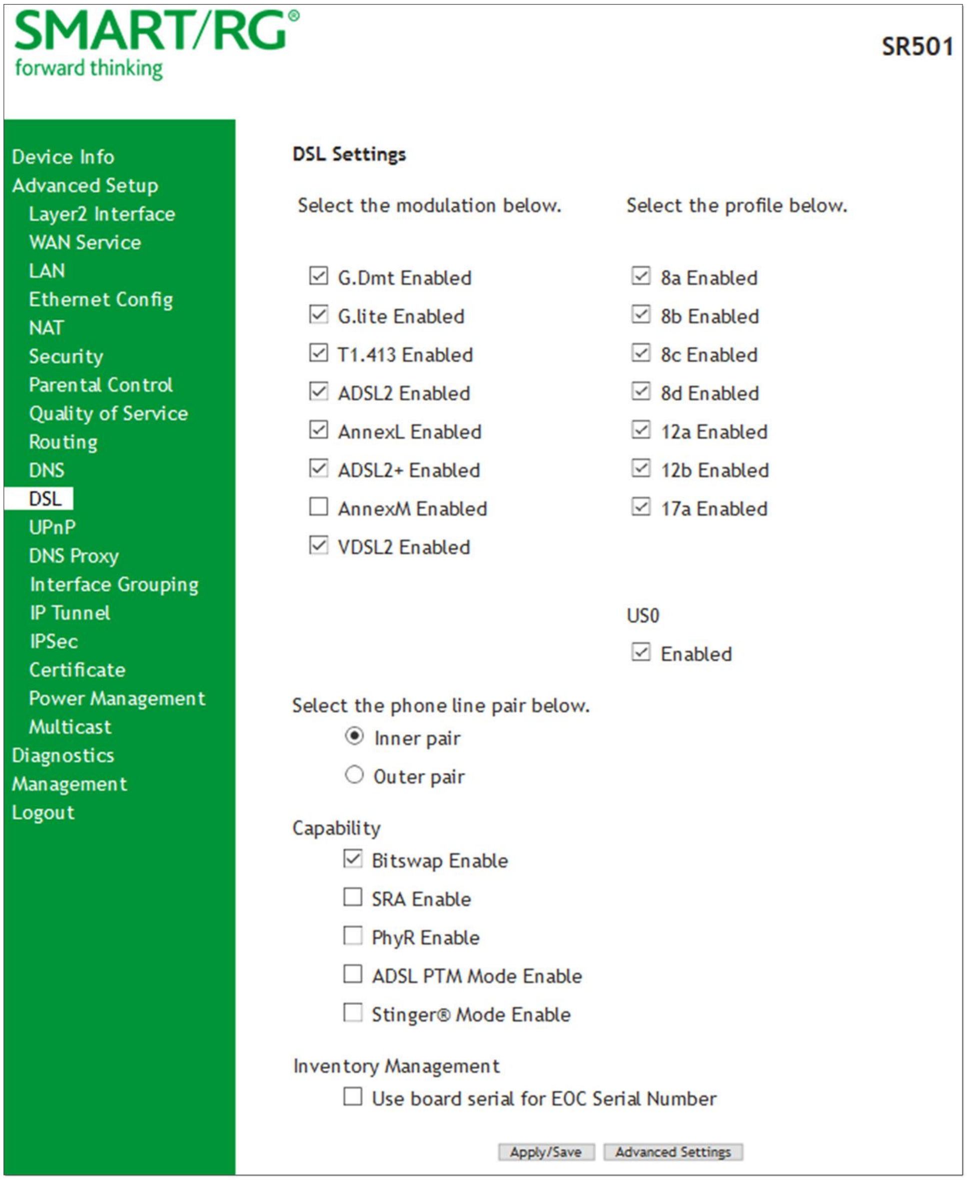
Field Name	Description
Hostname	Enter the hostname of the client computer.
IP Address	Enter the IP address of the DNS server client uses to assist in resolving domain names.

DSL

On this page, you can configure settings for the DSL interface.

Caution: Altering these settings unnecessarily can result in the gateway being unable to attain DSL synchronization.

1. In the left navigation bar, click **Advanced Setup** -> **DSL**. The following page appears.



DSL Settings

Select the modulation below.

☑ G.Dmt Enabled
☑ G.lite Enabled
☑ T1.413 Enabled
☑ ADSL2 Enabled
☑ AnnexL Enabled
☑ ADSL2+ Enabled
☐ AnnexM Enabled
☑ VDSL2 Enabled

Select the profile below.

☑ 8a Enabled
☑ 8b Enabled
☑ 8c Enabled
☑ 8d Enabled
☑ 12a Enabled
☑ 12b Enabled
☑ 17a Enabled

US0

☑ Enabled

Select the phone line pair below.

● Inner pair
○ Outer pair

Capability

☑ Bitswap Enable
☐ SRA Enable
☐ PhyR Enable
☐ ADSL PTM Mode Enable
☐ Stinger® Mode Enable

Inventory Management

☐ Use board serial for EOC Serial Number

2. Modify the settings as needed.

3. To configure advanced settings, see "Advanced settings".
4. Click **Apply/Save** to commit your changes.

The modulation settings are described in the table below.

Modulation	Data Transmission Rate	Max Downstream (Mbps)	Max Upstream (Mbps)
G.Dmt	ITU-T G.992.1 standard.	12	1.3
G.lite	ITU-T G.991.2 standard.	4	0.5
T1.413	ANSI T1.413 Issue 2 standard.	8	1.0
ADSL2	ITU-T G.992.3 standard.	12	1.0
AnnexL	Annex L of ITU-T G.992.3 standard which supports longer loops but with reduced transmission rates.		
ADSL2+	ITU-T G.992.5 standard.	28	1.0
AnnexM	Annex L of ITU-T G.992.5 standard which supports extended upstream bandwidth.	24	3
VDSL2	ITU-T G.993.2 standard.	100	60

The following table explains the maximum transaction power for each profile supported for SmartRG gateways.

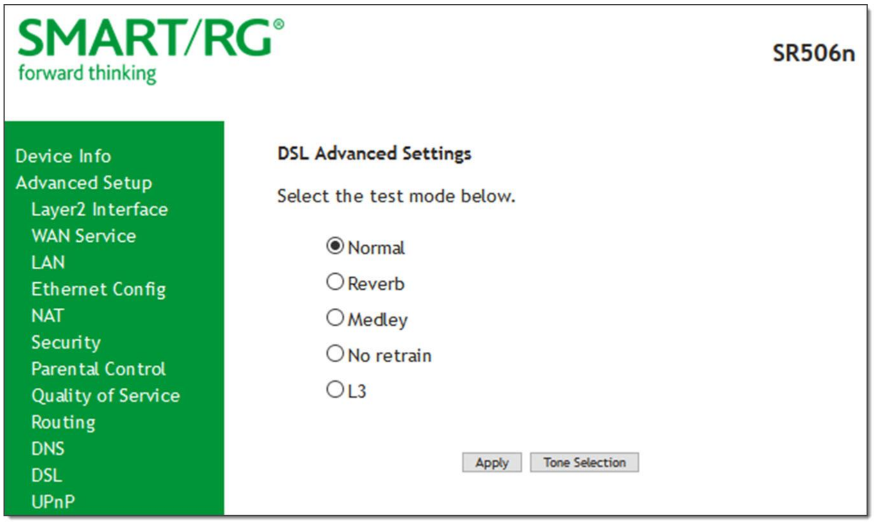
Parameter	8a	8b	8c	8d	12a	12b	17a
Max DS Tx Power (dBm)	+17.5	+20.5	+11.5	+14.5			
Max US Tx Power (dBm)	+14.5						
Min bidirectional net data rate	50Mbps				68Mbps		100Mbps

Field Name	Description
Other Settings	
US0	This option is *enabled* by default. To *disable* it, click the checkbox to clear it.
Inner Pair/Outer Pair	The RJ11 connector has four contacts. The center pair of pins is DSL1. The outer pins are the contacts for DSL2. Select which pair should be used.

Field Name	Description
Capability	• **Bitswap Enable**: Enables adaptive handshaking functionality. • **SRA Enable**: Enables Seamless Rate Adaptation. • **PhyR Enable**: Enables Physical Layer Retransmission. • **ADSL PTM Mode Enable**: Enables Asymmetric Digital Subscriber Line in Packet Transfer Mode. • **Stinger® Mode Enable**: Enables communication with Stinger type equipment.
Inventory Management	Select whether to use the gateway serial number as the EOC serial number in your inventory management database.

Advanced settings

1. To configure the test mode, click Advanced Settings on the Advanced Setup > DSL page. The following page appears.



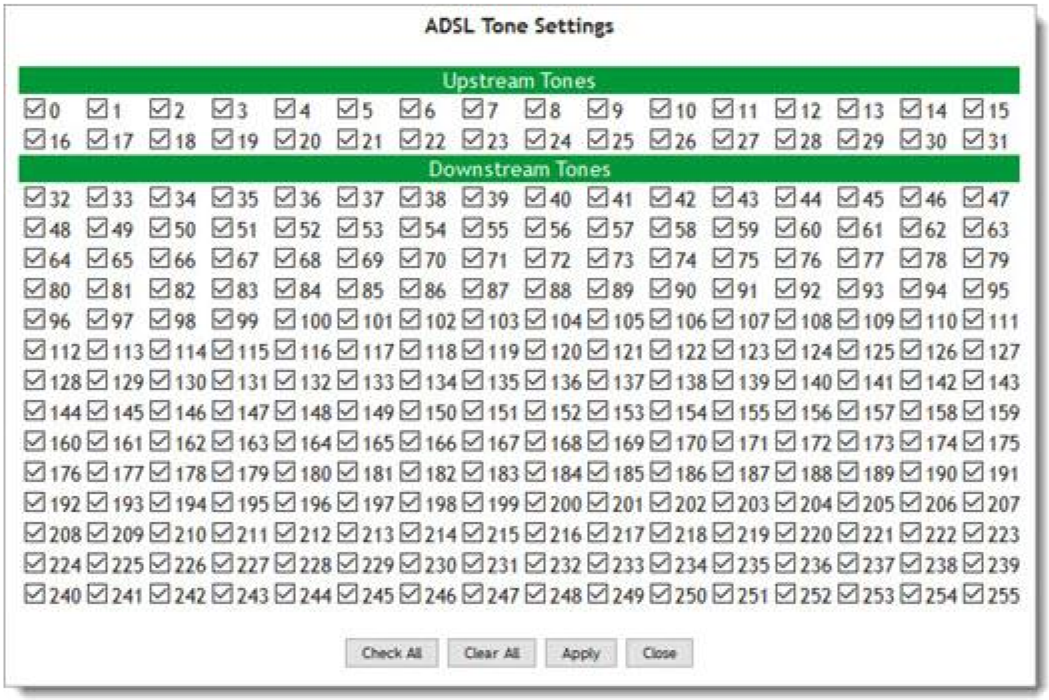
DSL Advanced Settings

Select the test mode below.

● Normal
○ Reverb
○ Medley
○ No retrain
○ L3

2. Click Apply to place the gateway in test mode.

3. To view the ADSL tone settings, click **Tone Selection**. TADSL Tone Settings page appears.



ADSL Tone Settings

Upstream Tones

☑0 ☑1 ☑2 ☑3 ☑4 ☑5 ☑6 ☑7 ☑8 ☑9 ☑10 ☑11 ☑12 ☑13 ☑14 ☑15
☑16 ☑17 ☑18 ☑19 ☑20 ☑21 ☑22 ☑23 ☑24 ☑25 ☑26 ☑27 ☑28 ☑29 ☑30 ☑31

Downstream Tones

☑32 ☑33 ☑34 ☑35 ☑36 ☑37 ☑38 ☑39 ☑40 ☑41 ☑42 ☑43 ☑44 ☑45 ☑46 ☑47
☑48 ☑49 ☑50 ☑51 ☑52 ☑53 ☑54 ☑55 ☑56 ☑57 ☑58 ☑59 ☑60 ☑61 ☑62 ☑63
☑64 ☑65 ☑66 ☑67 ☑68 ☑69 ☑70 ☑71 ☑72 ☑73 ☑74 ☑75 ☑76 ☑77 ☑78 ☑79
☑80 ☑81 ☑82 ☑83 ☑84 ☑85 ☑86 ☑87 ☑88 ☑89 ☑90 ☑91 ☑92 ☑93 ☑94 ☑95
☑96 ☑97 ☑98 ☑99 ☑100 ☑101 ☑102 ☑103 ☑104 ☑105 ☑106 ☑107 ☑108 ☑109 ☑110 ☑111
☑112 ☑113 ☑114 ☑115 ☑116 ☑117 ☑118 ☑119 ☑120 ☑121 ☑122 ☑123 ☑124 ☑125 ☑126 ☑127
☑128 ☑129 ☑130 ☑131 ☑132 ☑133 ☑134 ☑135 ☑136 ☑137 ☑138 ☑139 ☑140 ☑141 ☑142 ☑143
☑144 ☑145 ☑146 ☑147 ☑148 ☑149 ☑150 ☑151 ☑152 ☑153 ☑154 ☑155 ☑156 ☑157 ☑158 ☑159
☑160 ☑161 ☑162 ☑163 ☑164 ☑165 ☑166 ☑167 ☑168 ☑169 ☑170 ☑171 ☑172 ☑173 ☑174 ☑175
☑176 ☑177 ☑178 ☑179 ☑180 ☑181 ☑182 ☑183 ☑184 ☑185 ☑186 ☑187 ☑188 ☑189 ☑190 ☑191
☑192 ☑193 ☑194 ☑195 ☑196 ☑197 ☑198 ☑199 ☑200 ☑201 ☑202 ☑203 ☑204 ☑205 ☑206 ☑207
☑208 ☑209 ☑210 ☑211 ☑212 ☑213 ☑214 ☑215 ☑216 ☑217 ☑218 ☑219 ☑220 ☑221 ☑222 ☑223
☑224 ☑225 ☑226 ☑227 ☑228 ☑229 ☑230 ☑231 ☑232 ☑233 ☑234 ☑235 ☑236 ☑237 ☑238 ☑239
☑240 ☑241 ☑242 ☑243 ☑244 ☑245 ☑246 ☑247 ☑248 ☑249 ☑250 ☑251 ☑252 ☑253 ☑254 ☑255

Caution: Do not modify the tones selected unless under explicit instruction from a telecommunications professional.

4. Click **Apply** to commit your changes or **Close** to return to the previous page.

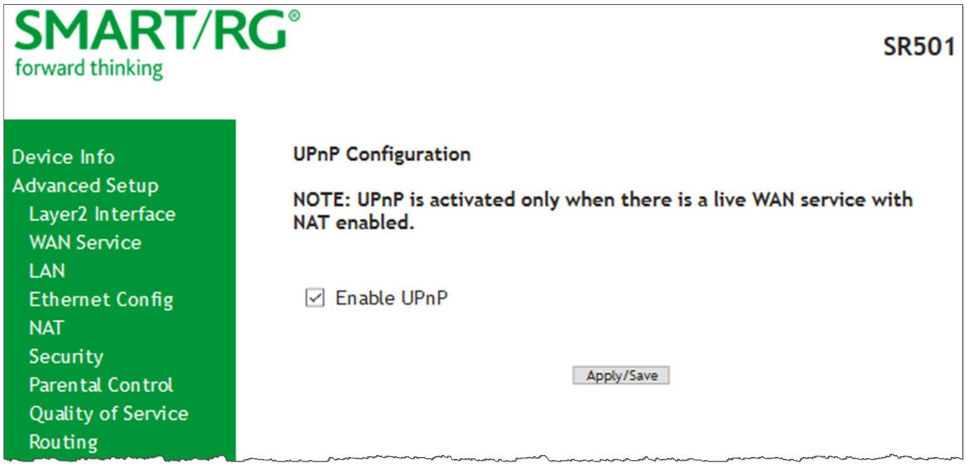
The fields on this page are explained in the following table.

Mode	Description
Normal	Puts the DSL PHY in test mode, sending only a Normal signal.
Reverb	Puts the DSL PHY in test mode, sending only a REVERB signal.
Medley	Puts the DSL PHY in test mode, sending only a MEDLEY signal.
No Retrain	The DSL PHY attempts to establish a connection as in Normal mode, but once the connection is up, it does not retrain even if the signal is lost.
L3	Puts the DSL modem in the L3 power state.

UPnP

On this page, you can enable UPnP when 3rd party devices on your LAN support this Universal Plug and Play standard. Common client devices include gaming consoles, IP cameras, printers and others. This feature is enabled by default.

1. In the left navigation bar, select **Advanced Setup** > **UPnP**. The following page appears.



UPnP Configuration

NOTE: UPnP is activated only when there is a live WAN service with NAT enabled.

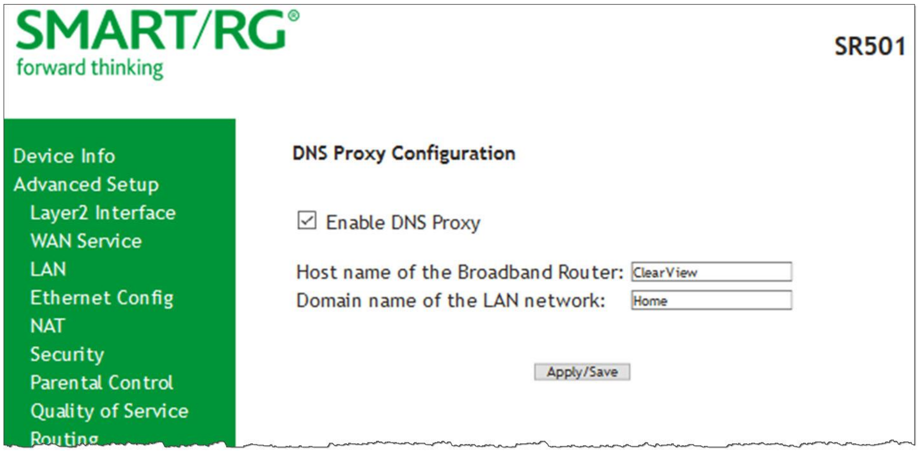
☑ Enable UPnP

2. To *disable* this option, click **Enable UPnP** to clear the box.
3. Click **Apply/Save** to commit your changes.

DNS Proxy

On this page, you can configure the DNS proxy settings. A DNS proxy improves domain look-up performance for clients by creating a historical cache of look-ups.

1. In the left navigation bar, click **Advanced Setup** > **DNS Proxy**. The following page appears.



DNS Proxy Configuration

☑ Enable DNS Proxy

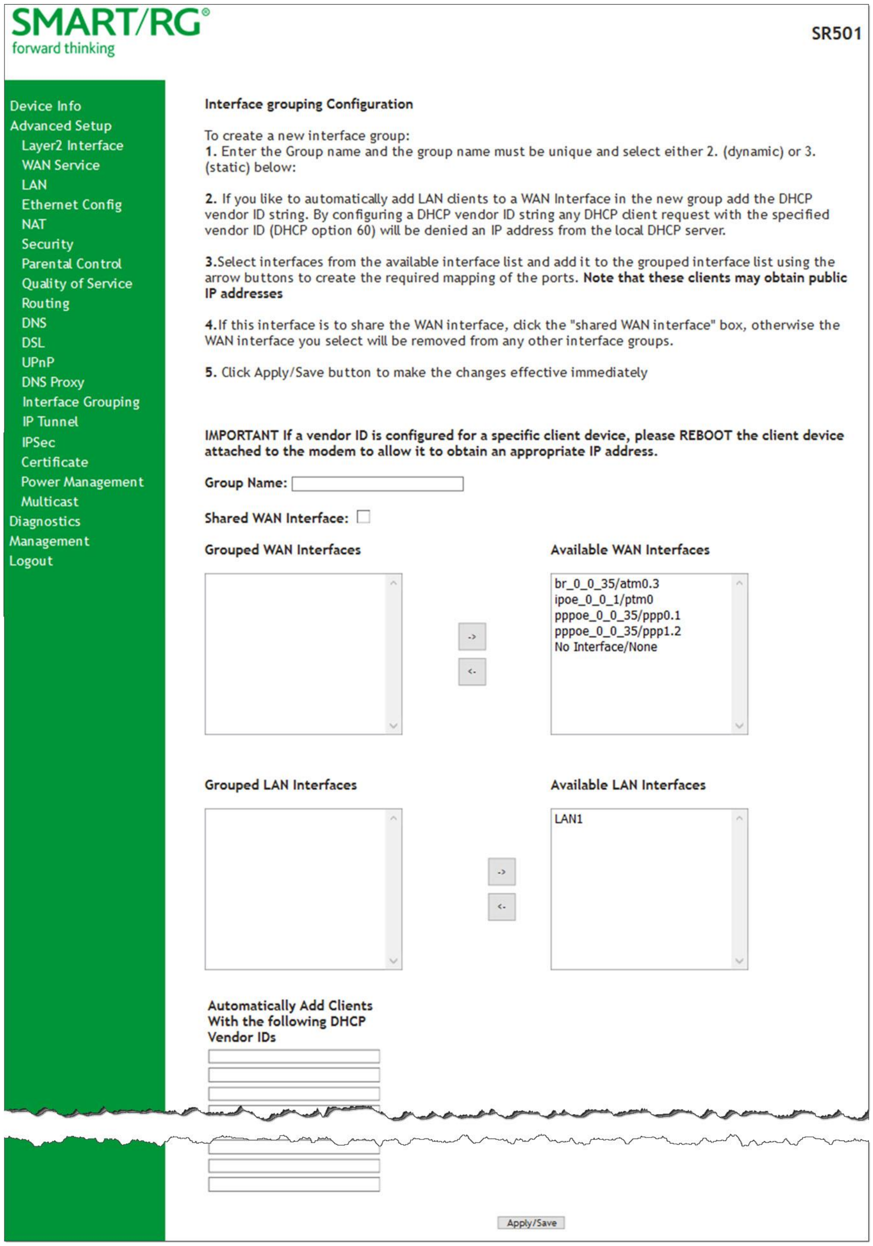
Host name of the Broadband Router: ClearView
Domain name of the LAN network: Home

2. If not already selected, click **Enable DNS Proxy**.
   The **Host name** and **Domain Name** fields appear.
3. Enter the host name of the broadband router and the domain name of the LAN network.
4. Click **Apply/Save** to commit your changes.

Interface Grouping

You can create an interface group to map local interfaces to WAN interfaces. A typical application for this feature is assigning IPTV STBs to a WAN interface.

1. In the left navigation bar, click **Advanced Setup** > **Interface Grouping** and then click **Add** (below the table). The following page appears.



Interface grouping Configuration

To create a new interface group:
1. Enter the Group name and the group name must be unique and select either 2. (dynamic) or 3. (static) below:

2. If you like to automatically add LAN clients to a WAN Interface in the new group add the DHCP vendor ID string. By configuring a DHCP vendor ID string any DHCP client request with the specified vendor ID (DHCP option 60) will be denied an IP address from the local DHCP server.

3.Select interfaces from the available interface list and add it to the grouped interface list using the arrow buttons to create the required mapping of the ports. **Note that these clients may obtain public IP addresses**

4.If this interface is to share the WAN interface, click the "shared WAN interface" box, otherwise the WAN interface you select will be removed from any other interface groups.

5. Click Apply/Save button to make the changes effective immediately

IMPORTANT If a vendor ID is configured for a specific client device, please REBOOT the client device attached to the modem to allow it to obtain an appropriate IP address.

Group Name:

Shared WAN Interface: □

Grouped WAN Interfaces

Available WAN Interfaces
br_0_0_35/atm0.3
ipoe_0_0_1/ptm0
pppoe_0_0_35/ppp0.1
pppoe_0_0_35/ppp1.2
No Interface/None

Grouped LAN Interfaces

Available LAN Interfaces
LAN1

Automatically Add Clients With the following DHCP Vendor IDs

2. To create a new interface group, enter a unique **Group Name**, then proceed with either step 3 (dynamic) or step 4 (static) below.
3. If this new grouped interface is to share the WAN interface, click **Shared WAN Interface**. *Not* selecting this option this will cause the WAN interface you select to be removed from any other interface groups.
   Important: If a vendor ID is configured for a specific client device, make sure to reboot the client device attached to the gateway to allow it to obtain an appropriate IP address.

4. Map the ports for the WAN or LAN interface:
   a. Select an interface from the applicable **Available Interface** list (on the right).
   b. Add it to the **Grouped Interface** list (on the left) by clicking the arrow to create the required mapping of the ports. Hold down the Shift key to select multiple interfaces.
      Note: Depending on the WAN interface configuration, these clients may obtain public IP addresses.
5. To automatically add LAN clients (such as set-top boxes) to a WAN Interface in the new group, enter the **DHCP Vendor ID** string. You can add up to 16 vendor IDs.
   When you configure a DHCP vendor ID string, any DHCP client request that includes this vendor ID is denied an IP address from the local DHCP server (DHCP option 60).
6. Click **Apply/Save**. Your changes take effect immediately.
7. To remove a grouping, on the Interface Grouping list page, select the grouping and click **Remove**. You can only remove groupings that you create.

IP Tunnel

IP Tunneling is typically used as a means to establish a path between two independent networks. Your SmartRG gateway supports connecting islands of IPv6 networks across the IPv4 internet or IPv4 in IPv6 as well.

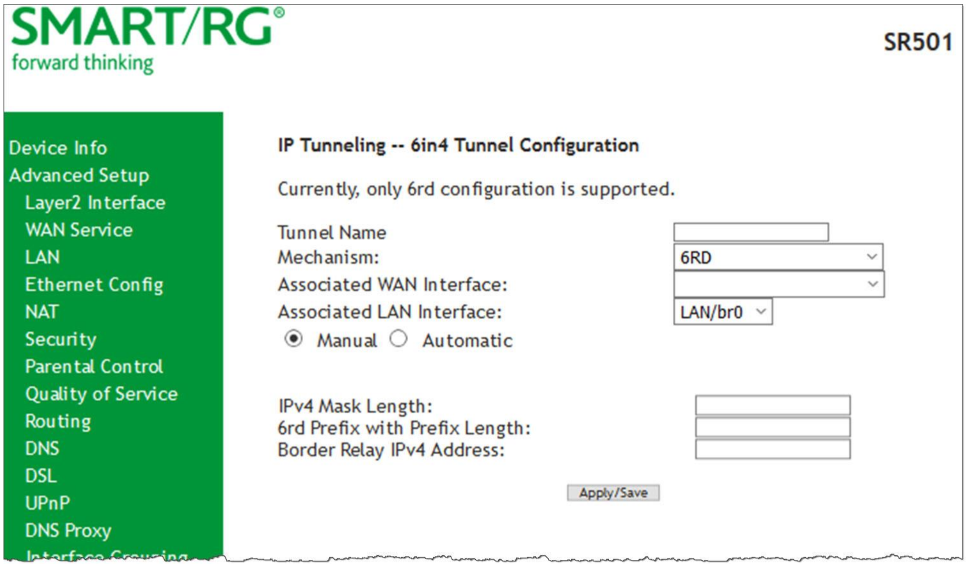
On this page, you can configure IP tunnel settings.

Note: For IPv6inIPv4, only 6rd configuration is supported. For IPv4inIPv6, only DS-Lite configuration is supported.

IPv6inIPv4

On this page, you can configure the IPv6inIP4 settings.

1. In the left navigation bar, click **Advanced Setup** > **IP Tunnel** and then click **Add**. The following page appears.



IP Tunneling -- 6in4 Tunnel Configuration

Currently, only 6rd configuration is supported.

Tunnel Name	
Mechanism:	6RD
Associated WAN Interface:	
Associated LAN Interface:	LAN/br0

● Manual ○ Automatic

IPv4 Mask Length:	
6rd Prefix with Prefix Length:	
Border Relay IPv4 Address:	

2. Enter a descriptive **Tunnel Name**.

   Skip the **Mechanism** field. Currently, only the **6RD** mechanism is supported.

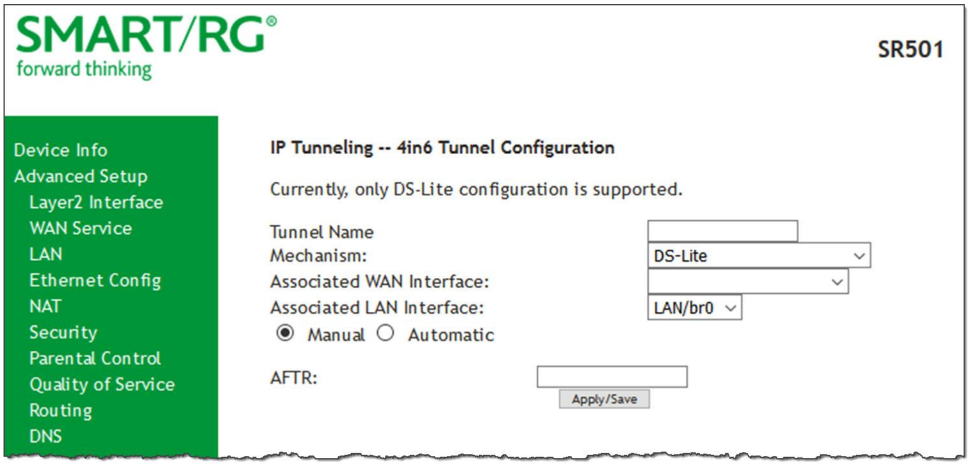
3. Select the **WAN** and **LAN** interfaces associated with the tunnel you wish to establish.
4. Do either of the following:
   a. To configure the LAN interface settings manually, enter values located below the **Manual** button.
      - **IPv4 Mask Length**: Options are **0** - **32**.
      - **6rd Prefix with Prefix Length**: prefix/length, such as: 2002::/64.
      - **Border Relay IPv4 Address**: Enter the IP address for the IPv6 relay server.

   b. To configure these settings automatically, select **Automatic**. The fields below the buttons are hidden.
5. Click **Apply/Save** to commit your changes.

IPv4inIPv6

On this page, you can configure the IPv4inIP6 settings.

1. In the left navigation bar, click **Advanced Setup** > **IP Tunnel** > **IPv6inIPv4** and then click **Add**. The following page appears.



IP Tunneling -- 4in6 Tunnel Configuration

Currently, only DS-Lite configuration is supported.

Tunnel Name
Mechanism: DS-Lite
Associated WAN Interface:
Associated LAN Interface: LAN/br0
● Manual ○ Automatic

AFTR:

Note: Currently, only the DS-Lite Mechanism is supported. Consult RFC6333 for further information regarding DS-Lite.

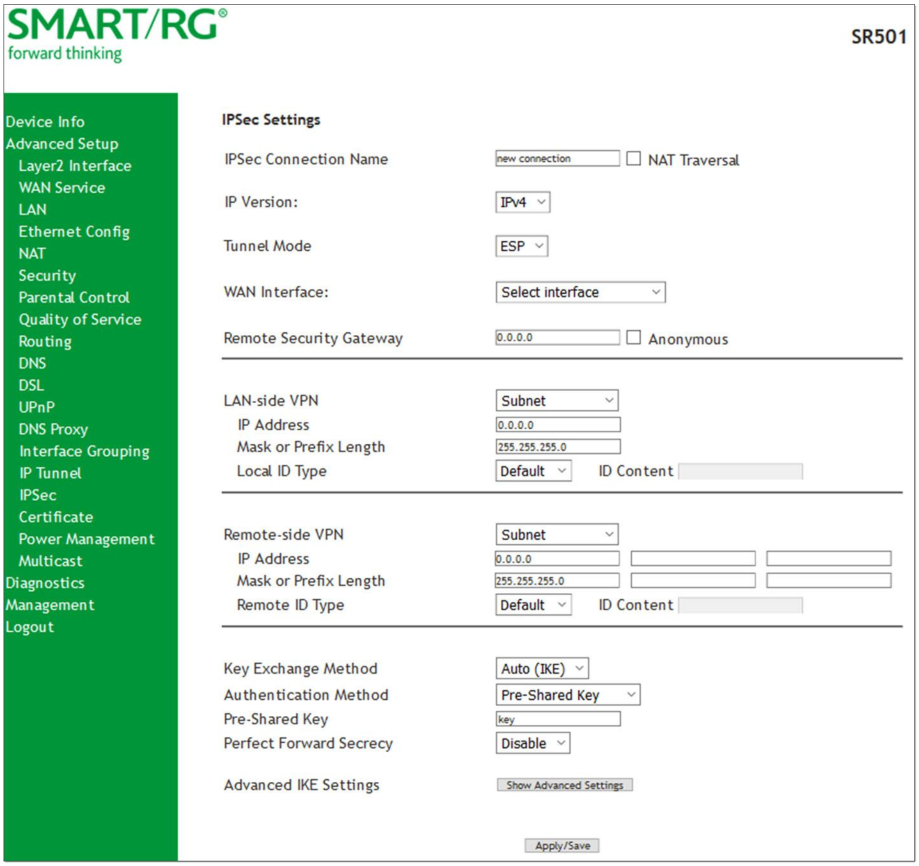
2. Enter a descriptive **Tunnel Name**.
3. Select the **LAN** and **WAN** interfaces associated with the tunnel you wish to establish.
4. Below **Associated LAN Interface**, enter the appropriate value for **AFTR** (Address Family Transition Router). To configure this setting automatically, select **Automatic**. The **AFTR** field is hidden.
5. Click **Apply/Save** to commit your changes.

IPSec

Internet Protocol Security is a protocol for securing communications by packet level encryption and authentication.

On this page, you can enable and remove IPSec connections, or edit existing connections.

1. In the left navigation bar, click **Advanced Setup** > **IP Sec** and then click **Add**. The following page appears.



IPSec Settings

IPSec Connection Name	new connection	□ NAT Traversal	
IP Version:	IPv4		
Tunnel Mode	ESP		
WAN Interface:	Select interface		
Remote Security Gateway	0.0.0.0	□ Anonymous	
LAN-side VPN	Subnet		
IP Address	0.0.0.0		
Mask or Prefix Length	255.255.255.0		
Local ID Type	Default	ID Content	
Remote-side VPN	Subnet		
IP Address	0.0.0.0		
Mask or Prefix Length	255.255.255.0		
Remote ID Type	Default	ID Content	
Key Exchange Method	Auto (IKE)		
Authentication Method	Pre-Shared Key		
Pre-Shared Key	key		
Perfect Forward Secrecy	Disable		
Advanced IKE Settings	Show Advanced Settings		

2. Complete the fields, using the information provided in the following table.
3. If desired, click **Advanced IKE Settings** to select Phase 1 and Phase 2 specific parameters. For detailed information about these settings, see "Advanced IKE Settings".
4. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
IPSec Connection Name	Enter a descriptive name for this connection.
NAT Transversal	Click to enable the NAT traversal protocol.
IP Version	Select the IP version associated with your infrastructure. Options are **IPv4** and **IPv6**.
Tunnel Mode	Select the encapsulation method to be used. Options are: • **AH**: Use this mode to encapsulate a packet with AH and IP headers. For authentication, the entire packet is signed. • **ESP**: Use this mode to encapsulate a packet with ESP and IP headers. An ESP trailer is added to the packet for authentication and integrity.
WAN Interface	Select the WAN connection to be associated with this tunnel.
Remote Security Gateway	Enter the WAN IP for this tunnel. To allow anonymous connections, click the Anonymous checkbox.
LAN-side VPN	Select whether to allow access to the entire LAN or a single host for local IP addresses. Options are: • **Subnet**: Allows access to the entire LAN. • **Single Address**: For single host, select this option.
IP Address	Enter the IP address used for local access.
Mask or Prefix Length	Enter the subnet mask or prefix length for IP address entered for local access. The default is **255.255.255.0**.
Local ID Type	Select the type of ID for the local VPN. Options are **Default**, **Domain**, and **E-Mail**. The default is **Default**. When you select **Domain** or **E-Mail**, enter the domain name or email address in the ID Content field.
Remote-side VPN	Select whether to allow access to the entire LAN or a single host for remote IP addresses. Options are: • **Subnet**: Allows access to the entire LAN. • **Single Address**: Allows access to a single host.
IP Address	Enter the IP address used for remote access.
Mask or Prefix Length	Enter the subnet mask or prefix length for IP address entered for remote access. The default is **255.255.255.0**.
Remote ID Type	Select the type of ID for the remote VPN. Options are **Default**, **Domain**, and **E-Mail**. The default is **Default**.

Field Name	Description
	When you select **Domain** or **E-Mail**, enter the domain name or email address in the ID Content field.
Key Exchange Method	Select the key-exchange method to be used for IPSec. Options are: • **Auto(IKE)**: This method uses the negotiated key-exchange method for IPSec. This is the default and recommended for best results. • **Manual**: This method requires that you configure the details.
Authentication Method	Select the method by which the remote end will authenticate. • **Pre-Shared Key**: A key is distributed to authorized users for logging into the system. Enter the key in the Pre-Shared Key field. • **Certificate (X.509)**: A certificate is used for authentication. Select the certificate file in the Certificates field that appears.
Pre-Shared Key	If you selected **Pre-Shared Key** in the Authentication Method field, enter the key here.
Perfect Forward Secrecy	Select whether a session key is derived from a set of long-term keys is compromised if one of the long-term keys in the set is compromised. • **Enable**: Prevents long-term key from being compromised. • **Disable**: Permits long-term keys to be compromised.
The following fields appear below Advanced Settings when **Manual** is selected in the Key Exchange Method field.	
Encryption Algorithm	Select the encryption algorithm. Options are **3DES** and **AES**.
Encryption Key	Enter the hex value for the selected encryption algorithm.
Authentication Algorithm	Select the authentication algorithm. Options are **MD5** and **SHA1**.
Authentication Key	Enter the hex value for the selected authentication algorithm.
SPI	Enter the hex value for the service provider interface (SPI). The default is **101**.

Advanced IKE Settings

You can configure advanced IKE settings if desired.

1. On the IPSec Settings page, click Show Advanced Settings to display the Phase 1 and Phase 2 fields.
2. Fill in the fields, using the information in the table below.

Field Name	Description
Mode	Select a mode. Options are **Main** and **Aggressive**.
Encryption Algorithm	Select the encryption algorithm. Options are **3DES** , **AES -128**, **AES-192**, and **AES-256**.
Integrity Algorithm	Select the integrity algorithm. Options are **MD5** and **SHA1**.
Select Diffie-Hellman Group for Key Exchange	Select the D-H group. Options are **768bit** - **8192bit**. The default is **1024bit**.
Key Life Time	Enter the number of seconds that a key is valid. The default is **3600** seconds.

3. Click Apply/Save to commit your changes.

Certificate

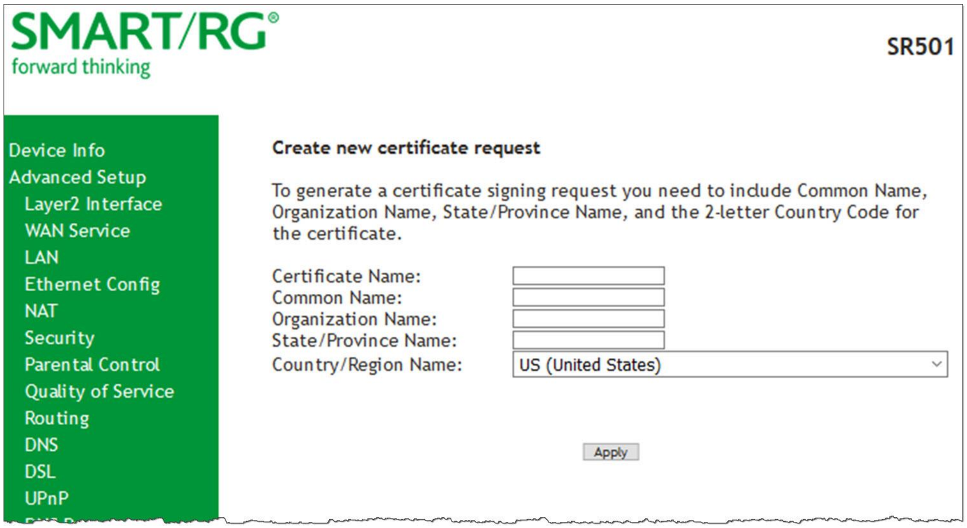
In this section, you can configure certificates for the gateway. You can use Local and Trusted CA certificates on this gateway.

Local

Local certificates are used to identify the gateway to other users. On this page, you can create a new certificate request and have it signed by a certificate authority, or you can import an existing certificate.

For additional info regarding Public Key Infrastructure (PKI), refer to ITU-T X.509.

1. In the left navigation bar, click Advanced Setup > Certificate > Local and then click Create Certificate Request. The following page appears.



Create new certificate request

To generate a certificate signing request you need to include Common Name, Organization Name, State/Province Name, and the 2-letter Country Code for the certificate.

Certificate Name:

Common Name:

Organization Name:

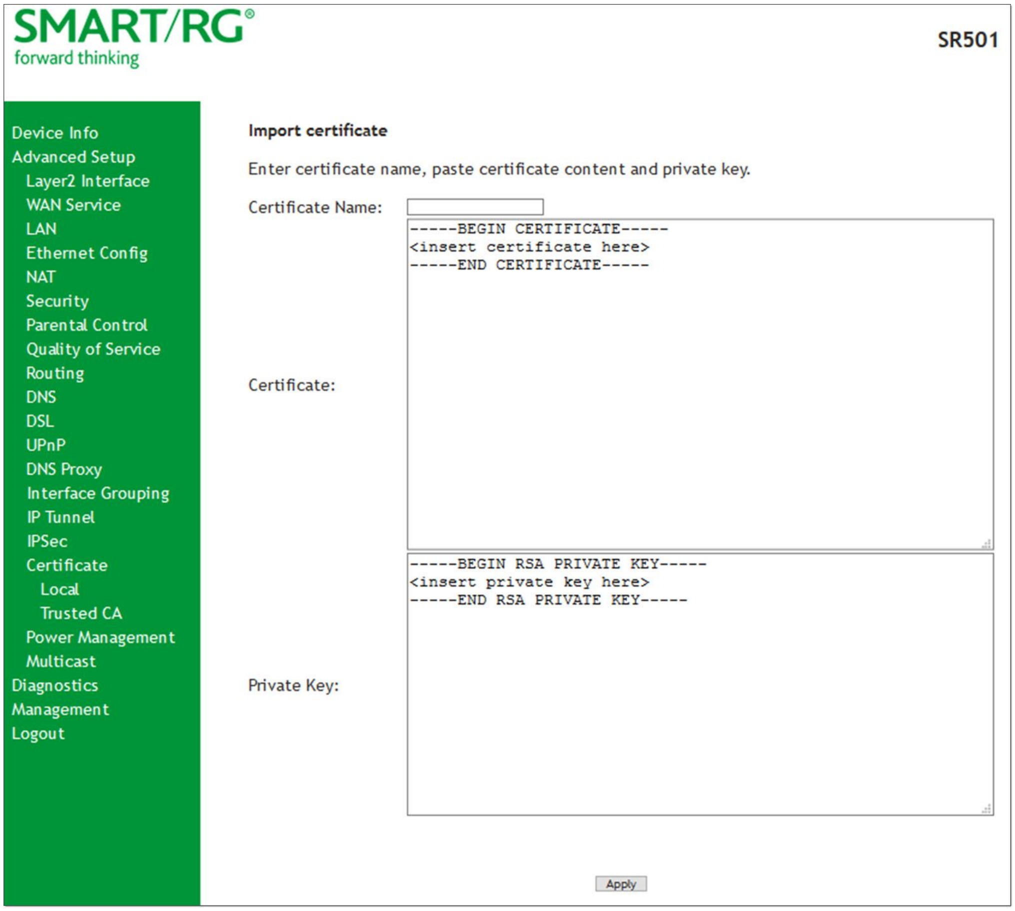
State/Province Name:

Country/Region Name: US (United States)

2. Complete the fields, using the information in the table below. For more information about certificates, refer to the ITU X.509 standard.
3. Click **Apply** to complete the request.

Field Name	Description
Certificate Name	Enter a description of the intended use of the certificate.
Common Name	Enter the IP address (in dotted decimal notation), domain name or email address in the field provided. The domain name or email address is for identification purposes and is a free-form text field.
Organization Name	A free form text field. Typically, this is the name of the company creating the request.
State/Province Name	Enter the state or province where this certificate will be used.
Country/Region	Select the country or region in which this certificate will be employed.

4. To import a certificate and the corresponding private key, on the Advanced Setup > Local Certificates page, click **Import Certificate**. The following page appears.



Import certificate

Enter certificate name, paste certificate content and private key.

Certificate Name:

Certificate:

```
-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
```

Private Key:

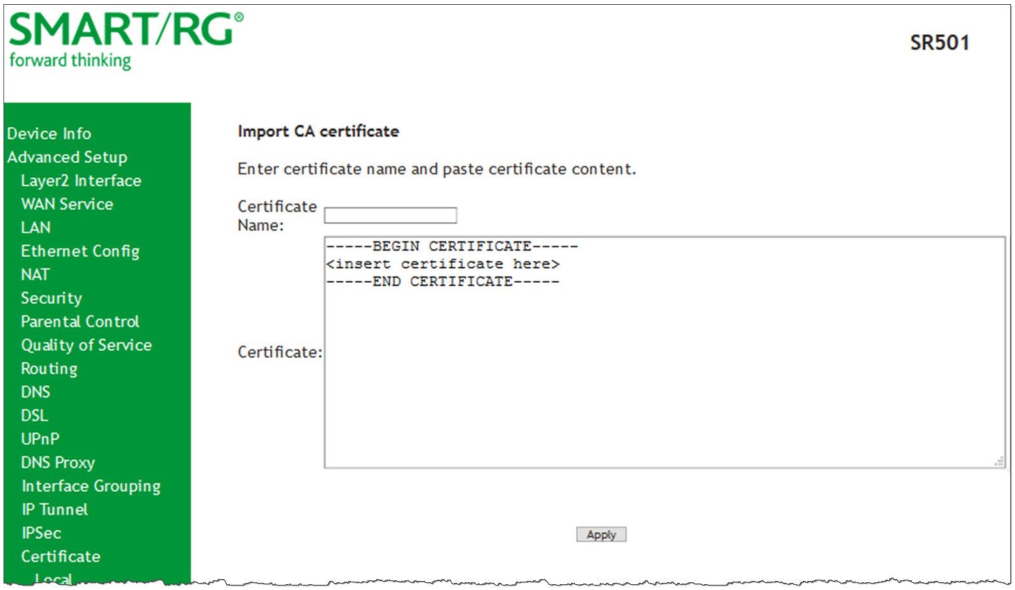
```
-----BEGIN RSA PRIVATE KEY-----
<insert private key here>
-----END RSA PRIVATE KEY-----
```

5. In the **Certificate Name** field, type "cpecert".
6. Paste the **Certificate** details between the **BEGIN** and **END** markers.
7. Paste the **Private Key** information between the **BEGIN** and **END** markers.
8. Click **Apply** to implement this certificate.

Trusted CA

On this page you import and store up to four trusted certificates. Trusted Certificates are used to identity other gateways to your gateway as a trusted source.

1. In the left navigation bar, click **Advanced Setup > Certificate > Trusted CA** and then click **Import Certificate**. The following page appears.



Import CA certificate

Enter certificate name and paste certificate content.

Certificate Name:

Certificate:

```
-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
```

2. In the **Certificate Name** field, type "acscert"
3. Paste the **Certificate** details between the **BEGIN** and **END** markers.
4. Click **Apply** to commit this certificate.

After you add one certificate, a **Remove** button appears on the **Trusted CA** landing page. Click this button to remove the current certificate and replace it with a new one.

Power Management

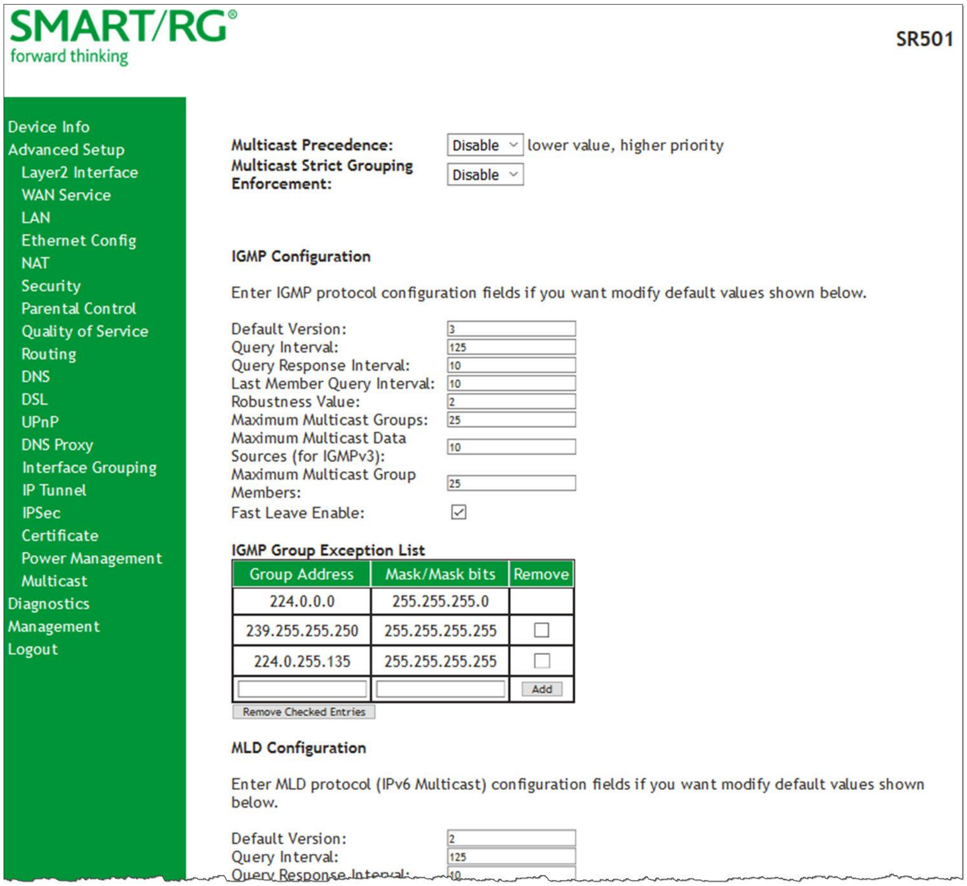
Note: This feature is not currently supported.

Multicast

Multicast methodology is used for applications shipping information simultaneously to multiple destinations. The most common scenario is Internet television and other streaming media. In IP Multicast, the implementation occurs at the IP routing level, where routers create the most efficient distribution paths for packets sent to a destination.

On this page, you can configure the multicast settings.

1. In the left navigation bar, select **Advanced Setup** > **Multicast**. The following page appears.



Multicast Precedence: Disable lower value, higher priority
Multicast Strict Grouping Enforcement: Disable

IGMP Configuration

Enter IGMP protocol configuration fields if you want modify default values shown below.

Default Version: 3
Query Interval: 125
Query Response Interval: 10
Last Member Query Interval: 10
Robustness Value: 2
Maximum Multicast Groups: 25
Maximum Multicast Data Sources (for IGMPv3): 10
Maximum Multicast Group Members: 25
Fast Leave Enable: ☑

IGMP Group Exception List

Group Address	Mask/Mask bits	Remove
224.0.0.0	255.255.255.0	
239.255.255.250	255.255.255.255	□
224.0.255.135	255.255.255.255	□
		Add

Remove Checked Entries

MLD Configuration

Enter MLD protocol (IPv6 Multicast) configuration fields if you want modify default values shown below.

Default Version: 2
Query Interval: 125
Query Response Interval: 10

2. Modify the settings as needed, using the information in the table below. The same fields are provided for both IGMP and MLD configuration.
3. To add addresses to the exception lists, in the **Group Exception List** tables, enter any additional address and mask information and then click **Add**.

   Note: For the IGMP list, the **Group Address** must be between 244.x.x.x and 239.x.x.x. For the MLD table, the **Group Address** must be a valid IPv6 address.

4. To remove addresses from the exception lists, click the checkbox in the **Remove** column next to the address(es) and then click **Remove Checked Entries**. The list refreshes immediately.
5. Click **Apply/Save** to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
Multicast Precedence	Select whether IGMP packets are given priority handling and at what level. Options are: • **1 - 4:** IGMP packets are prioritized using the multicast precedence value. The lower the multicast precedence value, the higher that IGMP packets will be placed in the queue. • **Disable:** IGMP packets are not prioritized. This is the default.
Multicast Strict Grouping Enforcement	Select whether strict grouping is applied to IGMP packets. Options are **Enable** and **Disable**.
IGMP Configuration and **MLD Configuration** sections	
Default Version	Select the supported IGMP version. Options are **1** - **3**.
Query Interval	Enter the interval (in seconds) at which the multicast router sends a query messages to hosts. the default is **125**. **Note:** If you enter a number below 128, the value is used directly. If you enter a number 128, it is interpreted as an exponent and mantissa.
Query Response Interval	Upon receiving a query packet, a host begins counting down seconds, from a random number. When the timer expires, the host sends its report. The default is **10** seconds. Enter the maximum number of seconds that a host can pick to count down from. The value must be greater than the **Query Interval**. If using IGMP v1, this value is fixed at **10** seconds.
Last Member Query Interval	Enter the maximum response time (in seconds) within which the host must respond to the Out of Sequence query from the router. The default is **10** seconds. IGMP uses this value when the router receives an IGMPv2 Leave report indicating at least one host wants to leave the group. Upon receiving the Leave report, the router verifies whether the interface is configured for IGMP Immediate Leave. If not, the router sends the out-of-sequence query.
Robustness Value	Enter the value representing the complexity of the query. The greater the value, the more robust the query. Options are **2** - **7**. The default is **2**.
Maximum Multicast Groups	Enter the maximum number of groups allowed. The default is **25**.

Field Name	Description
Maximum Multicast Data Sources (for IGMPv3)	Enter the maximum number of data sources allowed. Options are **1** - **24**. The default is **10**.
Maximum Multicast Group Members	Enter the maximum number of multicast groups that can be joined on a port or group of ports. The default is **25**.
Fast Leave Enable	Select whether the IGMP proxy removes group members immediately without sending a query. Options are: • **Enabled:** Group members are removed immediately. This is the default. • **Disabled:** Group members are removed after a query is sent and a response received.

Diagnostics

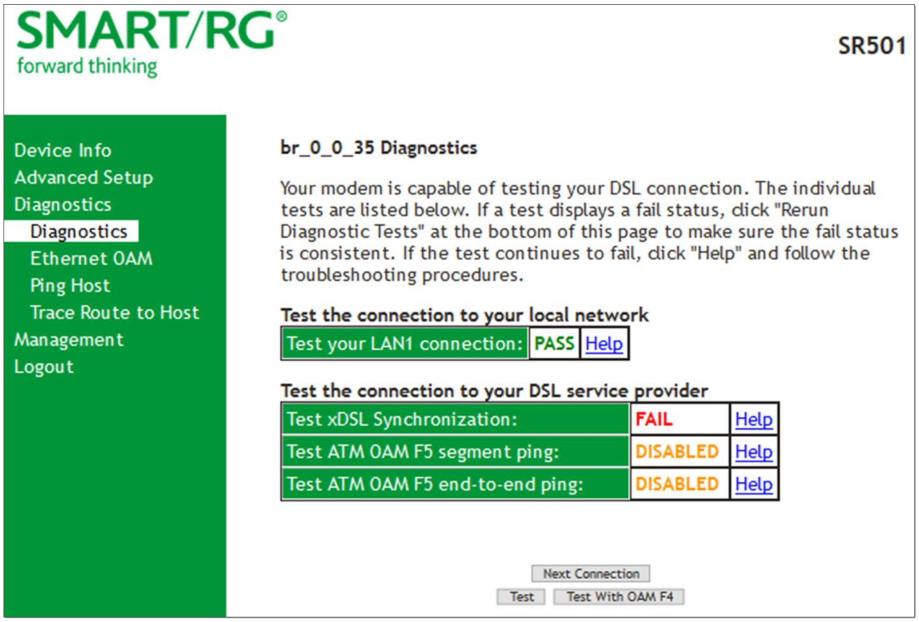
in this section, you can run line performance tests. Three legs of the data path are included in the available tests: LAN connectivity, DSL connectivity and Internet connectivity tests.

You can also ping a host or trace a connection.

Diagnostics

On this page, you can view information about your DSL connections.

1. In the left navigation bar, click **Diagnostics** > **Diagnostics**. The following page appears.



br_0_0_35 Diagnostics

Your modem is capable of testing your DSL connection. The individual tests are listed below. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.

Test the connection to your local network

Test your LAN1 connection:	PASS	Help

Test the connection to your DSL service provider

Test xDSL Synchronization:	FAIL	Help
Test ATM OAM F5 segment ping:	DISABLED	Help
Test ATM OAM F5 end-to-end ping:	DISABLED	Help

2. To refresh the displayed data, click **Test** at the bottom of the page.

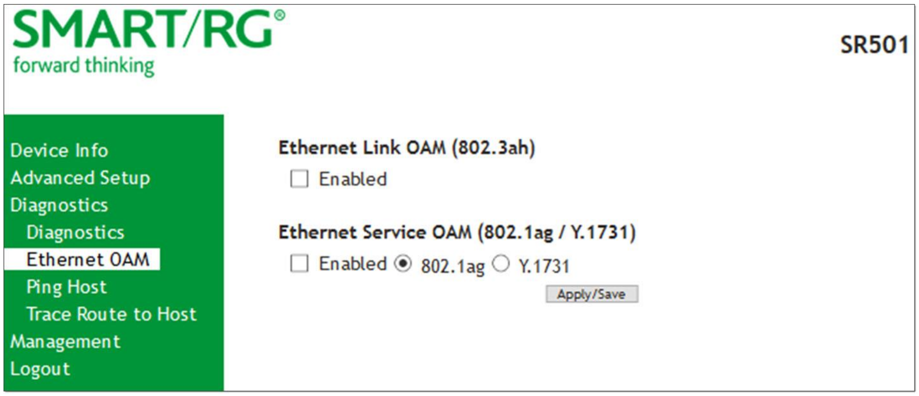
   The normal test method is initiated, utilizing OAM F5 loopback cells. The table is updated with fresh diagnostic information about connection integrity. To learn more about what is being tested and what actions to take in the event that a particular test should fail, click the **Help** link at the far right of each line item.

3. To test at the VP level instead of at an individual VC connection, click **Test With OAM F4**.
4. To test additional connections, click **Next Connection**. The page refreshes to show data for the next connection and the **Previous Connection** button appears. Repeat steps 2-4 for each connection.

Ethernet OAM

On this page, you can view diagnostics regarding your VDSL PTM or Ethernet WAN connection. Fault Management is compliant with IEEE 802.1ag for Connectivity Fault Management.

1. In the left navigation bar, click **Diagnostics** > **Ethernet OAM**. The following page appears.



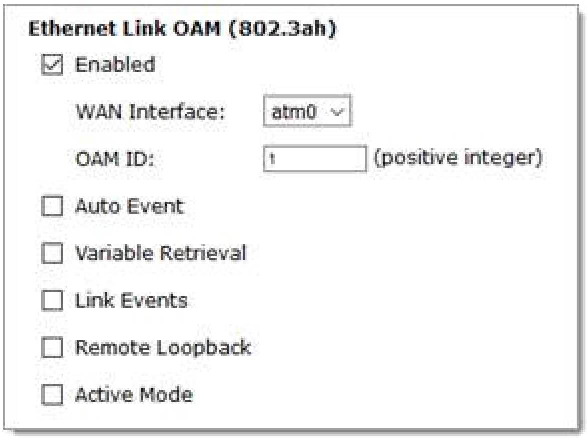
Ethernet Link OAM (802.3ah)

☐ Enabled

Ethernet Service OAM (802.1ag / Y.1731)

☐ Enabled ● 802.1ag ○ Y.1731

2. To enable **Ethernet Link OAM (802.3ah)**:
   a. Click the **Enabled** checkbox. Additional fields appear.



Ethernet Link OAM (802.3ah)

☑ Enabled

WAN Interface: atm0

OAM ID: 1 (positive integer)

☐ Auto Event

☐ Variable Retrieval

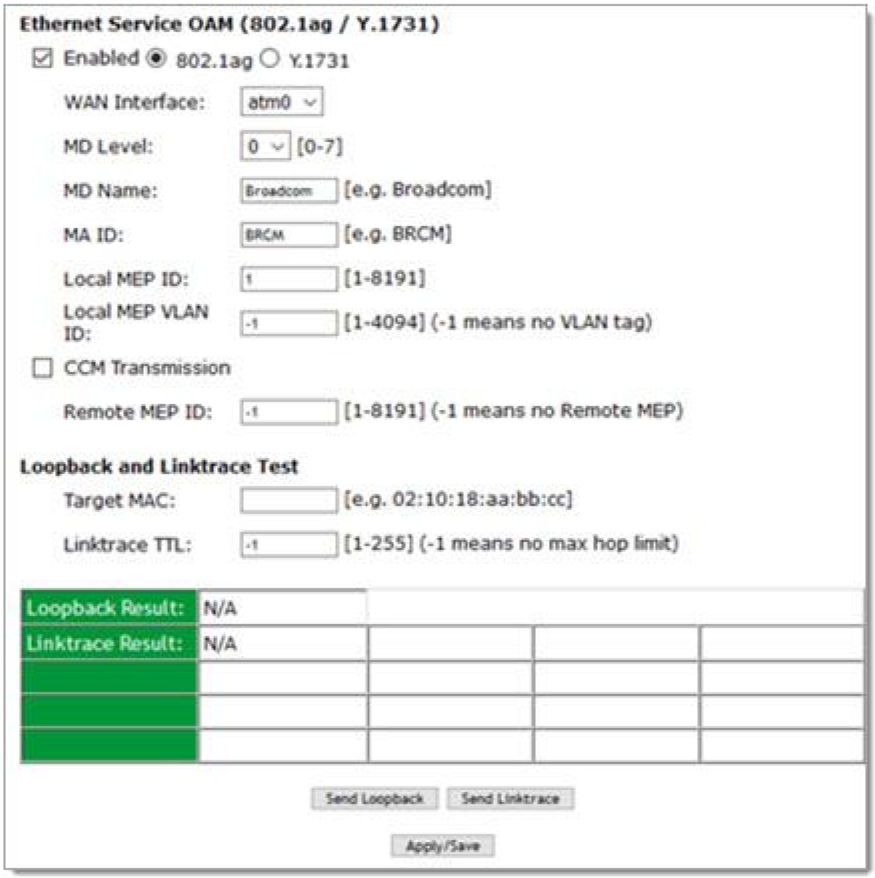
☐ Link Events

☐ Remote Loopback

☐ Active Mode

   b. Modify the fields as needed, using the information in the **Ethernet Link OAM (802.3ah)** section of the table below.

3. To enable **Ethernet Service OAM (802.1ag/Y.1731)**:
   a. Click the **Enabled** checkbox. Additional fields appear showing values for 802.1ag. To configure Y.1731, click the **Y.1731** radio button. The page refreshes.



Ethernet Service OAM (802.1ag / Y.1731)

☑ Enabled ● 802.1ag ○ Y.1731

WAN Interface:	atm0	
MD Level:	0	[0-7]
MD Name:	Broadcom	[e.g. Broadcom]
MA ID:	BRCM	[e.g. BRCM]
Local MEP ID:	1	[1-8191]
Local MEP VLAN ID:	-1	[1-4094] (-1 means no VLAN tag)

□ CCM Transmission

Remote MEP ID:	-1	[1-8191] (-1 means no Remote MEP)

Loopback and Linktrace Test

Target MAC:		[e.g. 02:10:18:aa:bb:cc]
Linktrace TTL:	-1	[1-255] (-1 means no max hop limit)

Loopback Result:	N/A			
Linktrace Result:	N/A			

b. Modify the fields, using the information provided in the **Ethernet Service OAM (802.1ag/Y.1731)** section of the table below.

4. Click **Apply/Save** to commit your changes.
5. To run a loopback test, enter a MAC address in the **Target MAC** field and click **Send Loopback** at the bottom of the page. The results appear in the **Loopback Result** row of the table.
6. To run a linktrace test, enter a MAC address in the **Target MAC** field and click **Send Linktrace** at the bottom of the page. The results appear in the **Linktrace Resul**t row of the table.

The fields on this page are explained in the following table.

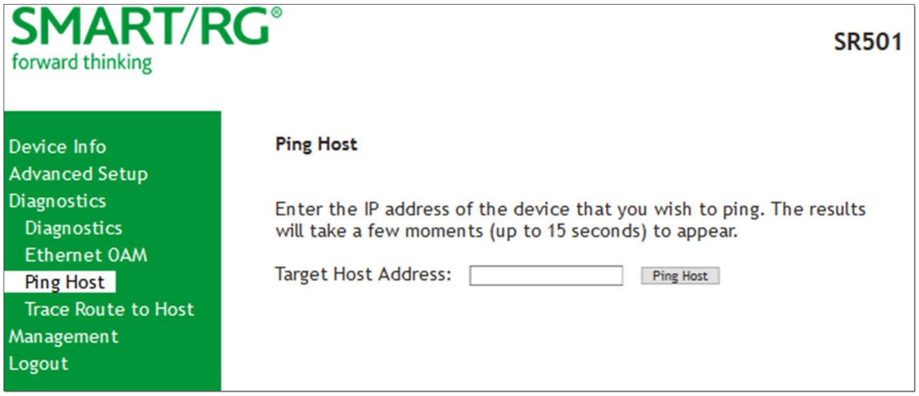
Field Name	Description
Ethernet Link OAM (802.3ah) section	
WAN Interface	Select the WAN interface that you want to test.
OAM ID	Enter the ID of this OAM configuration. Only positive numbers are allowed.
Auto Event	Click to enable automatic reporting of events.
Variable Retrieval	Click to enable on-demand link diagnostics, including bit-error-rate approximation.
Link Events	Click to enable reporting of critical conditions that may cause link failure.

Field Name	Description
Remote Loopback	Click to enable on-demand link diagnostics, including bit-error-rate approximation.
Active Mode	Click to enable this feature.
Ethernet Service OAM (802.1ag/Y.1731) section	
WAN Interface	Select the WAN interface that you want to test.
MD Level	*(Appears for the 802.1ag option only)* Select the domain level for this maintenance domain. Options are **0** - **7**. The larger the domain, the higher the value you should select.
MD Name	*(Appears for the 802.1ag option only)* Enter the name of the maintenance domain, e.g., Broadcom.
MA ID	*(Appears for the 802.1ag option only)* Enter the maintenance association ID, e.g., BRCM.
MEG Level	*(Appears for the Y.1731 option only)* Enter the level of the maintenance entity group.
MEG ID	*(Appears for the Y.1731 option only)* Enter the ID of the MEG.
Local MEP ID	Enter the ID of the local maintenance entity group end point.. Options are **1** - **8191**. The default is **1**.
Local MEP VLAN ID	Enter the VLAN ID of the local MEP. Options are **1** - **4094**. The default is **-1** (no VLAN tag).
CCM Transmission	Click to enable continuity check message transmission.
Remote MEP ID	Enter the ID of the remote MEP. Options are **1** - **8191**. The default is **-1** (no remote MEP).
Loopback and Linktrace Test section	
Target MAC	Enter the MAC address for the test, e.g., 02:10:18:aa:bb:cc.
Linktrace TTL	Enter the maximum number of hops allowed. Optinons are **1**- **233**. The default is **-1** (no limit).
Loopback Result	Displays the results of the loopback test.
Linktrace Result	Displays the results of the linktrace test.

Ping Host

On this page you can ping a server by host name or IP address.

1. In the left navigation menu, click **Diagnostics Tools** > **Ping Host**. The following page appears.



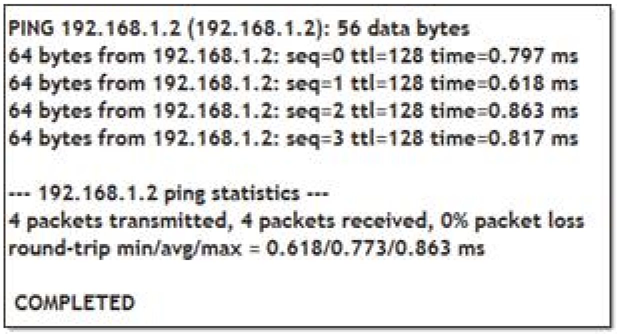
Ping Host

Enter the IP address of the device that you wish to ping. The results will take a few moments (up to 15 seconds) to appear.

Target Host Address: [ ] Ping Host

2. Enter the host name or IP address.

3. Click **Submit**. The details of the ping appear on the page.

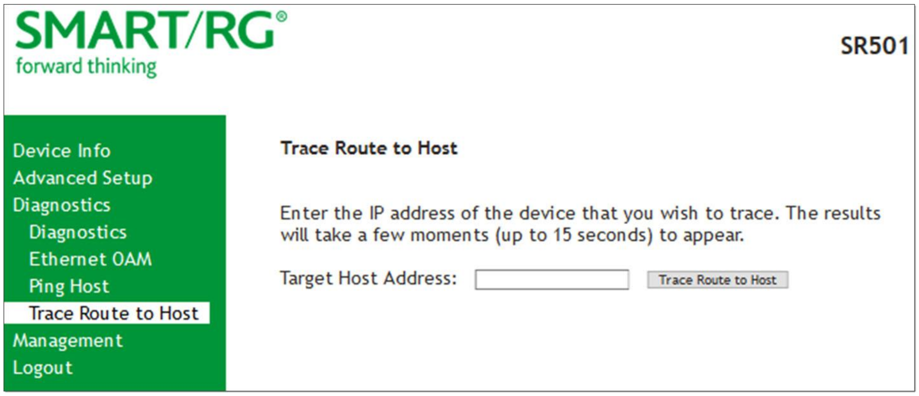


```
PING 192.168.1.2 (192.168.1.2): 56 data bytes
64 bytes from 192.168.1.2: seq=0 ttl=128 time=0.797 ms
64 bytes from 192.168.1.2: seq=1 ttl=128 time=0.618 ms
64 bytes from 192.168.1.2: seq=2 ttl=128 time=0.863 ms
64 bytes from 192.168.1.2: seq=3 ttl=128 time=0.817 ms

--- 192.168.1.2 ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 0.618/0.773/0.863 ms

 COMPLETED
```

Trace Route to Host

On this page, you can use the Trace Route utility to trace a connection.

1. In the left navigation menu, click **Diagnostics Tools** > **Trace Route to Host**. The following page appears.

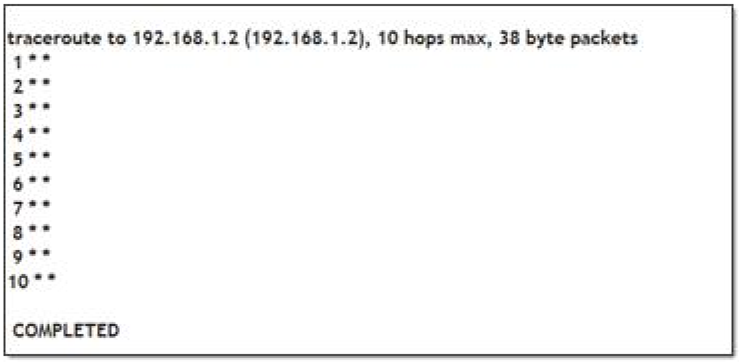


Trace Route to Host

Enter the IP address of the device that you wish to trace. The results will take a few moments (up to 15 seconds) to appear.

Target Host Address: [ ] [Trace Route to Host]

2. Enter the host name or IP address that you want to trace.
3. Click **Trace Route to Host**. The details of the trace appear on the page.



```
traceroute to 192.168.1.2 (192.168.1.2), 10 hops max, 38 byte packets
 1 * *
 2 * *
 3 * *
 4 * *
 5 * *
 6 * *
 7 * *
 8 * *
 9 * *
10 * *

 COMPLETED
```

Management

In this section, you can manage configuration files, access control, management server configurations, and work with event logs.

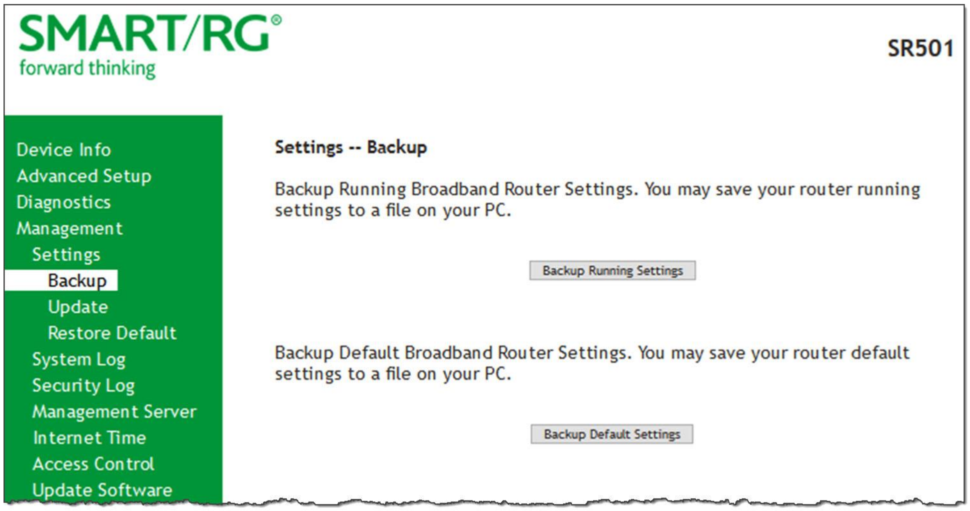
Settings

In this section, you can back up the current settings, restore saved settings, or reset the gateway to default settings.

Backup

You can back up the current settings for your gateway to a file stored on your computer.

1. In the left navigation bar, click **Management**. The following page appears.



Settings -- Backup

Backup Running Broadband Router Settings. You may save your router running settings to a file on your PC.

Backup Default Broadband Router Settings. You may save your router default settings to a file on your PC.

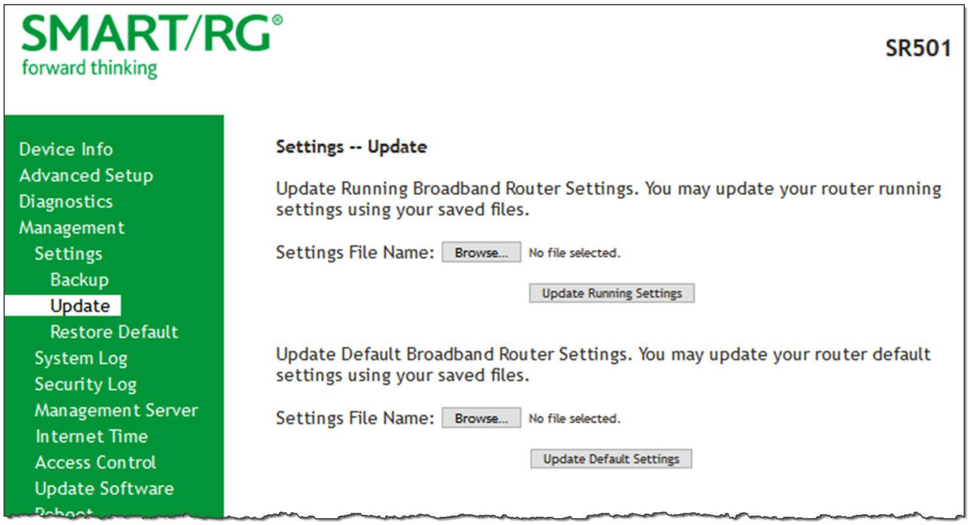
2. To save a backup file of the *currently running* settings to a local drive, click **Backup Running Settings**. The File Upload dialog box appears. Click **OK**. The backupsettings.conf file is created in your default download location.
3. To save a backup file of the *default* settings to a local drive, click **Backup Default Settings**. The Save dialog box appears. Click **OK**. The backupdefaultsettings.conf file is created in your default download location.

Note: If you plan to create backups frequently, you may want to rename the backup files by appending dates to the file name. Otherwise, every new backup file overwrites the existing backup file.

Update

On this page, you can restore previously backed-up gateway settings. Both current and default settings can be managed here.

1. In the left navigation bar, click **Management** > **Settings** > **Update**. The following page appears.



Settings -- Update

Update Running Broadband Router Settings. You may update your router running settings using your saved files.

Settings File Name:

Update Default Broadband Router Settings. You may update your router default settings using your saved files.

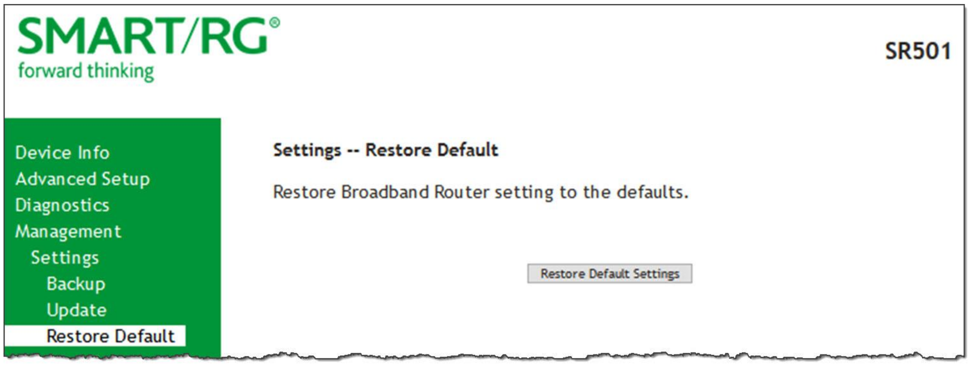
Settings File Name:

2. Click the **Browse** button for the type of setting you wish to restore.
3. Locate the desired .conf file on your local system and click **Open**.
4. Click the appropriate **Update** button.
   The gateway reboots when the update has completed.

Restore Default

On this page, you can reset the gateway to its default settings which can be the factory defaults or defaults that you customized and stored.

1. In the left navigation bar, click **Management** > **Settings** > **Restore Default**. The following page appears.



Settings -- Restore Default

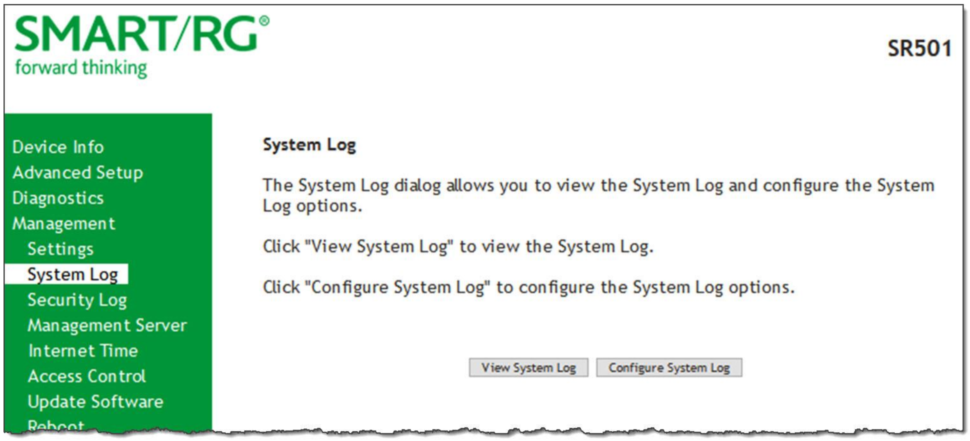
Restore Broadband Router setting to the defaults.

2. Click **Restore Default Settings**. The gateway is rebooted and the default settings overwrite the previous settings.

System Log

On this page you can view and configure the system log generated for your gateway.

1. In the left navigation bar, click **Management** > **System Log**. The following page appears.



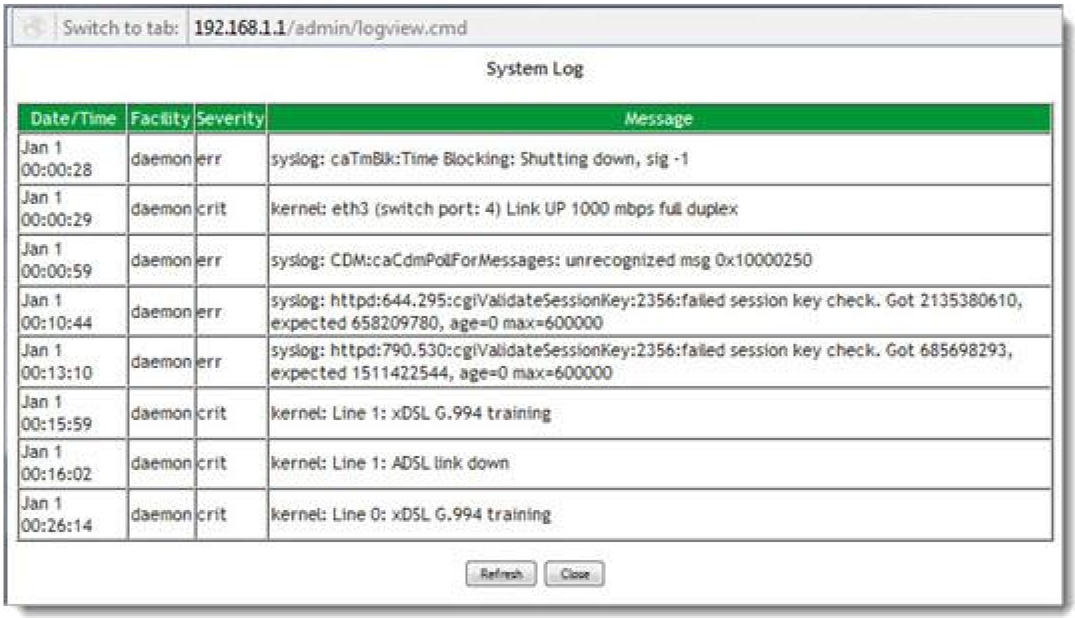
System Log

The System Log dialog allows you to view the System Log and configure the System Log options.

Click "View System Log" to view the System Log.

Click "Configure System Log" to configure the System Log options.

2. To view the contents of the system log, click **View System Log**. The System Log details page appears.

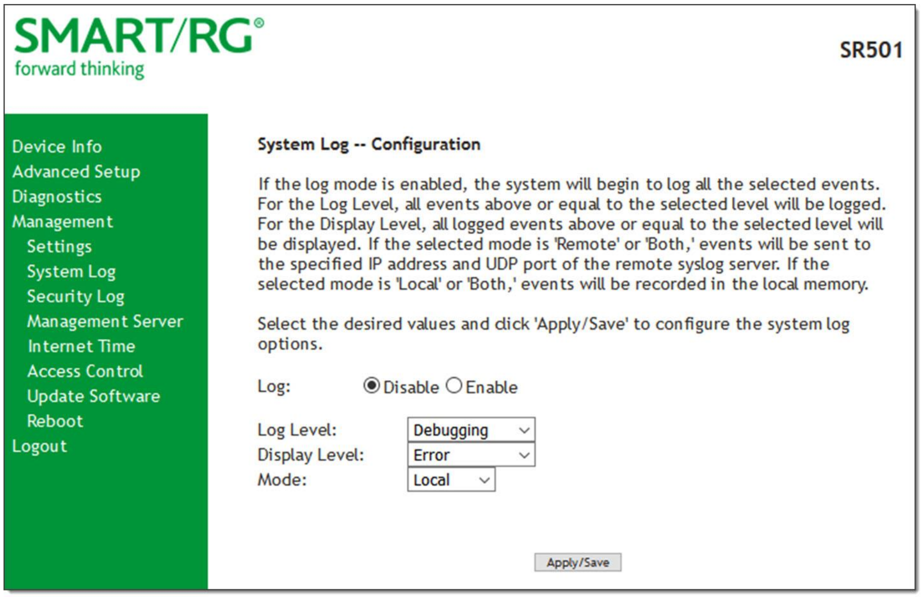


System Log

Date/Time	Facility	Severity	Message
Jan 1 00:00:28	daemon	err	syslog: caTmBlk:Time Blocking: Shutting down, sig -1
Jan 1 00:00:29	daemon	crit	kernel: eth3 (switch port: 4) Link UP 1000 mbps full duplex
Jan 1 00:00:59	daemon	err	syslog: CDM:caCdmPollForMessages: unrecognized msg 0x10000250
Jan 1 00:10:44	daemon	err	syslog: httpd:644.295:cgiValidateSessionKey:2356:failed session key check. Got 2135380610, expected 658209780, age=0 max=600000
Jan 1 00:13:10	daemon	err	syslog: httpd:790.530:cgiValidateSessionKey:2356:failed session key check. Got 685698293, expected 1511422544, age=0 max=600000
Jan 1 00:15:59	daemon	crit	kernel: Line 1: xDSL G.994 training
Jan 1 00:16:02	daemon	crit	kernel: Line 1: ADSL link down
Jan 1 00:26:14	daemon	crit	kernel: Line 0: xDSL G.994 training

3. To update the displayed entries, click **Refresh**.

4. To modify the system log settings:
   a. Click Configure System Log. The System Log - Configuration page appears.



System Log -- Configuration

If the log mode is enabled, the system will begin to log all the selected events. For the Log Level, all events above or equal to the selected level will be logged. For the Display Level, all logged events above or equal to the selected level will be displayed. If the selected mode is 'Remote' or 'Both,' events will be sent to the specified IP address and UDP port of the remote syslog server. If the selected mode is 'Local' or 'Both,' events will be recorded in the local memory.

Select the desired values and click 'Apply/Save' to configure the system log options.

Log: ● Disable ○ Enable

Log Level: Debugging
Display Level: Error
Mode: Local

   b. Modify the settings as needed, using the information provided in the following table.

Action	Description
Log	Select to turn logging off or on. The default is **Disable**.
Logging Level	Select **Error** unless actively troubleshooting a situation with a subscriber for which increased log detail is required. Options are **Emergency**, **Alert**, **Critical**, **Error**, **Notice**, **Warning**, **Informational**, and **Debugging**. The options are listed in top-down order. The default is **Debugging**.
Display Level	Select **Error** unless actively troubleshooting a situation with a subscriber for which increased detail is required. This field has the same options as the Logging Level field. The default is **Error**.
Mode	Select where log events will be sent. To send logs to the specified IP address and UDP port of a remote syslog server, select **Remote** or **Both**. To record events in the local memory of your SmartRG gateway, select **Local** or **Both**.

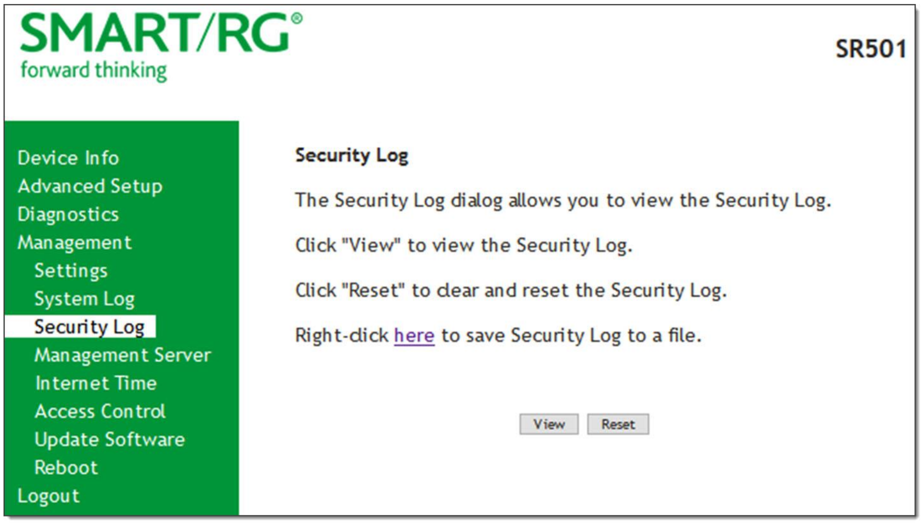
   c. Click Apply/Save to save your changes.

Security Log

The security log contains a history of events related to sensitive access to the gateway. Logged events include:

- Password change success/failure
- Authorized login success/failure
- Security lockout added/removed
- Authorized/unauthorized resource access
- Software update

1. In the left menu, click **Management** > **Security Log**. The following page appears.



Security Log

The Security Log dialog allows you to view the Security Log.

Click "View" to view the Security Log.

Click "Reset" to clear and reset the Security Log.

Right-click here to save Security Log to a file.

2. Do any of the following:
   - To view the log, click **View**.
   - To purge the log entries and start fresh, click **Reset**. A confirmation message appears. Click **Close**.
   - To export the log to a local drive, click the **here** link in the last line of the instructions on the page. The log appears in the browser window. You can save the page or select all of the log text, paste it into a Notepad window and save the file.

Management Server

A management server is an Auto Configuration Server (ACS) such as Cisco Prime Home which offers significant advantages in terms of automation and productivity when managing subscriber devices in the field.

In this section, you can configure ACS settings for the TR-069 client and configure STUN server settings.

TR-069 Client

On this page, you can configure the gateway with details about the management ACS to which this gateway will be linked.

SmartRG gateways support TR-069-based standards for remote management. The TR-069 client page is preset with default connection parameters and generally only needs to be enabled, pointed to the ACS URL, and any required ACS credentials entered.

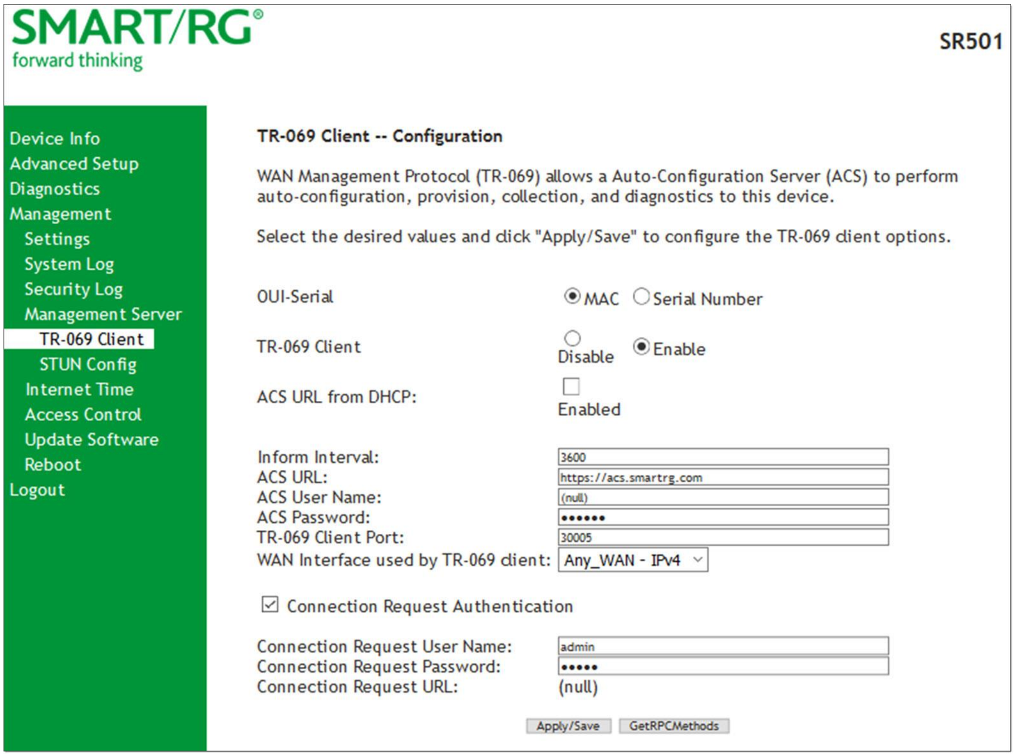
SmartRG products can accommodate several ACS products, including:

- Device Manager by SmartRG
- Cisco Prime Home
- Calix Consumer ACS

A minimum firmware level of v2.5.0.x is required.

If you need to modify the request defaults, consult the ACS manufacturer's documentation.

1. In the left navigation bar, click **Management** > **Management Server**. The following page appears.



TR-069 Client -- Configuration

WAN Management Protocol (TR-069) allows a Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics to this device.

Select the desired values and click "Apply/Save" to configure the TR-069 client options.

OUI-Serial	● MAC ○ Serial Number
TR-069 Client	○ Disable ● Enable
ACS URL from DHCP:	□ Enabled
Inform Interval:	3600
ACS URL:	https://acs.smartrg.com
ACS User Name:	(null)
ACS Password:	••••••
TR-069 Client Port:	30005
WAN Interface used by TR-069 client:	Any_WAN - IPv4

☑ Connection Request Authentication

Connection Request User Name:	admin
Connection Request Password:	•••••
Connection Request URL:	(null)

2. Modify the fields as needed, following the instructions from your ACS platform vendor. Information about specific fields is provided in the table below.
3. Click **Apply/Save** to commit your changes.

   Note: This manual does not cover the setup of your ACS. Consult the materials provided by your ACS vendor to determine the appropriate parameters and server settings for configuring remote WAN side management via an ACS using the TR-069 Protocol.

   The fields on this page are explained in the following table.

   Note: Please consult with your ACS vendor for any specific connection request requirements impacted by the following settings.

Field Name	Description
OUI-Serial	Select whether to use the base MAC address or the serial number of your gateway when connecting to the ACS. This value may display in an ACS user interface when looking at the device details of a particular gateway. • **Serial Number**: Select for SmartRG gateways using firmware version 2.5.0.2 and above. • **MAC**: This is the most typical scenario. This is the default. For firmware versions prior to 2.5.0.2, MAC is the only available option.
TR-069 Client	Enable or disable the TR-069 client on the CPE. You can disable the TR-069 WAN Management Client if no ACS is employed. **Note:** If you may want to add an ACS to your infrastructure in the future, it is recommended to leave this option enabled. When this feature is disabled, every gateway deployed with this setting must be manually/locally re-configured to enable this client if needed later.
ACS URL from DHCP	Click the **Enabled** checkbox to enable your gateway to obtain the ACS URL via DHCP. The default is disabled.
Inform Interval	The frequency (in seconds) with which the CPE (gateway) checks in with the ACS to sync and exchange data. A typical production environment entails CPEs in the field informing to the ACS once/day or every 86,400 seconds. The default is **300** seconds.
ACS URL	Enter the URL for the CPE to connect to the ACS using the CPE WAN Management Protocol. This parameter MUST be in the form of a valid HTTP or HTTPS URL. An HTTPS URL indicates that the ACS supports SSL. The "host" portion of this URL is used by the CPE for validating the certificate from the ACS when using certificatebased authentication. You can include a port specification suffix if your ACS platform requires it, e.g., http://customer.acs.wanmanagmentservices.com:30005 where 30005 is the port number. The default port is **30005**.
ACS User Name	Enter the user name by which this gateway logs in to the ACS. The default username is typically **admin.**
ACS Password	Enter the password to authenticate the above user name. The default password is typically **admin.**
TR-069 Client Port	Enter the TR-069 port number.
WAN Interface used by TR-069 client	Select any WAN, LAN, Loop back or a configured connection to declare how this gateway will connect to the ACS. The default is **Any_WAN - IPv4**.

4. (*Optional*) You can configure the gatway's client Connection Request mechanism which is used by your ACS for communication with subscriber gateways.

Field Name	Description
Connection Request Authentication	Select if your ACS requires authenticated connection requests. Complete the additional credential fields that are exposed. The default condition is enabled.
Connection Request Username	Enter the user name by which this gateway authenticates the ACS. Contact your ACS provider for this information. The default username is typically **admin**.
Connection Request Password	Enter the password by which this gateway will authenticate to the ACS. Contact your ACS provider for this information. The default password is typically **admin**.
Connection Request URL	If a WAN service has been configured, the URL appears in this field.

5. To force the gateway to attempt to sync with the ACS, click the **GetRPCMethods** button. This will assist you in verifying the TR-069 parameters entered above.
6. If you made any further changes, click **Apply/Save** to commit them.

STUN Config

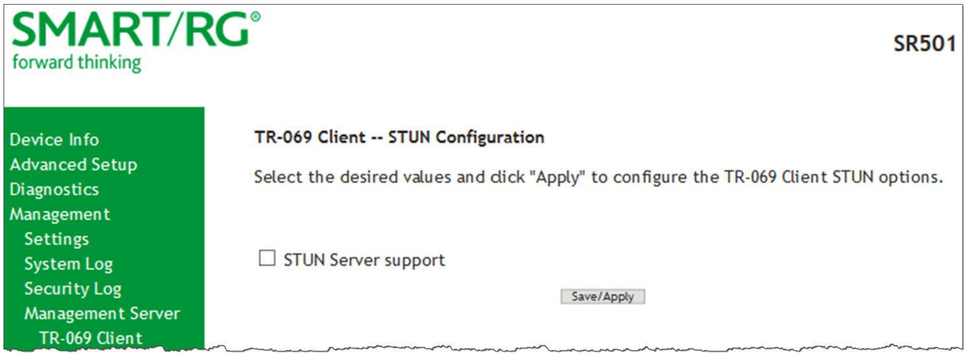
STUN stands for “Simple Traversal of UDP through NATs”. STUN enables a device to find out its public IP address and the type of NAT service it is sitting behind.

STUN is most commonly used with older modems under ACS management connected via a NAT gateway. NAT accommodates a LAN-side device that has been allocated a Private IP address such as a CPE device on a private network behind an ONT. In this instance, the regular CWMP Connection Request mechanism to talk to the modem gateway cannot be used to initiate a session with that ACS.

A STUN server receives STUN requests and sends STUN responses. STUN servers are generally attached to the public Internet.

On this page, when a STUN server is present within the infrastructure of the Service Provider, you can configure this gateway with the connectivity specifics for that server.

1. In the left navigation bar, click **Management** > **Management Server** > **STUN Config**. The STUN Configuration page appears.

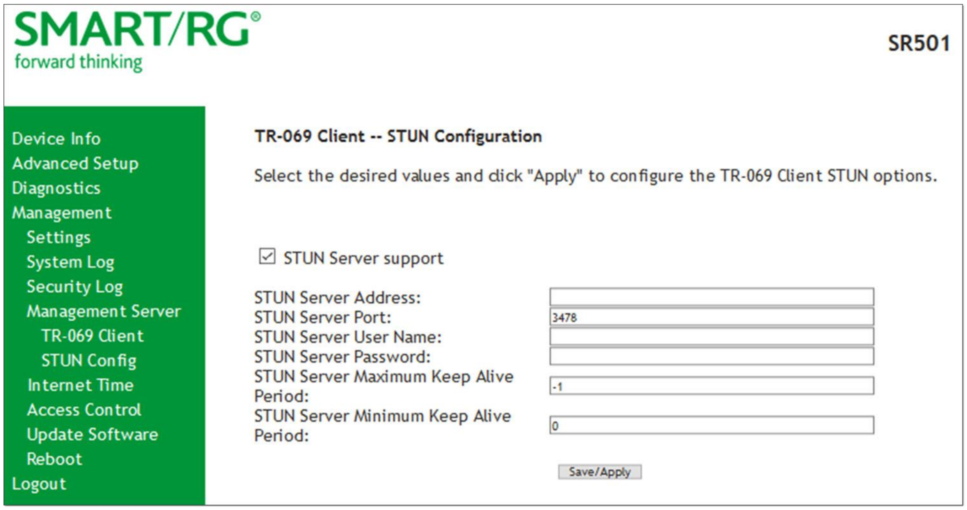


TR-069 Client -- STUN Configuration

Select the desired values and click "Apply" to configure the TR-069 Client STUN options.

☐ STUN Server support

2. To view the required STUN settings, click **STUN Server Support**. Additional fields appear.



TR-069 Client -- STUN Configuration

Select the desired values and click "Apply" to configure the TR-069 Client STUN options.

☑ STUN Server support

STUN Server Address:	
STUN Server Port:	3478
STUN Server User Name:	
STUN Server Password:	
STUN Server Maximum Keep Alive Period:	-1
STUN Server Minimum Keep Alive Period:	0

3. Complete the fields in accordance with the implementation specifics of your server. Information about the fields is provided in the table below.
4. Click **Save/Apply** to commit your changes.

The fields on this page are explained in the following table.

Field Name	Description
STUN Server Address	The physical STUN server's assigned network address. An invalid address will produce an immediate on-page error message from the gateway. You can enter a maximum of 256 characters An ACS server may also have STUN functionality running on the same physical box. Consult your ACS vendor for implementation options and also TR-069 protocol documentation, if necessary.
STUN Server Port	Set the port number associated with your STUN server infrastructure. Options are **0** - **64435**. The default is **3478**.
STUN Server User Name	The username by which the gateway accesses the STUN infrastructure. Maximum length is 256 characters. Special characters are valid.
STUN Server Password	The password by which the modem authenticates the above username to the STUN infrastructure. Maximum length is 256 characters. Special characters are valid. The value will be hidden.

Field Name	Description
STUN Server Maximum Keep Alive Period *	Enter the maximum keepalive time in seconds. Options are any integer. The default is **-1** (no maximum time).
STUN Server Minimum Keep Alive Period *	Enter the maximum keepalive time in seconds. Options are any integer. The default is **0**.

* This mechanism is used in coordination with the refreshing of NAT bindings. Specifically, in conjunction with use of Restricted Cone NAT or Port Restricted Cone NAT (as may be configured in some gateways). A device's internal address / port mappings, which the STUN protocol is allowed to make use of, can have keep alive values attributed. These minimum and maximum keep alive times define respectively, the minimum time to retain the mapping information STUN has discovered, and the maximum time to retain that information, before refreshing it through forced re-discovery.

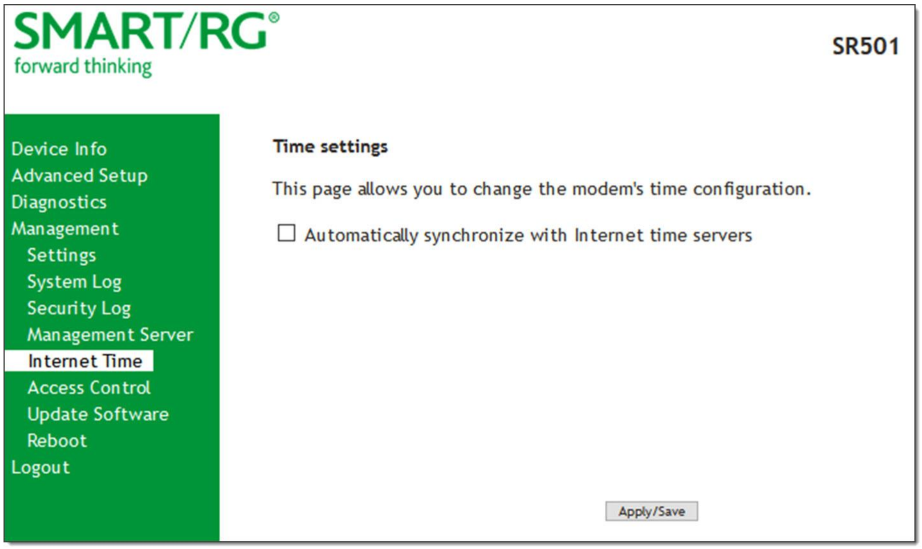
Which values are appropriate for these two fields is influenced by a variety of environmental factors including devices types deployed, services employed and NAT configuration options enabled within the topology.

With the above-mentioned NAT schemes, it is possible the network address translation initially established may not be used after a specified elapsed time. Such internal mapping is dropped. The gateway will then assign a different address mapping. This mechanism allows for coordinated refresh on the bindings for mappings it uses. For further information, review STUN-related RFCs.

Internet Time

On this page, you can configure the gateway to synchronize its time with the Internet time servers. This feature is enabled by default.

1. In the left navigation bar, click **Management** > **Internet Time**. The following page appears.

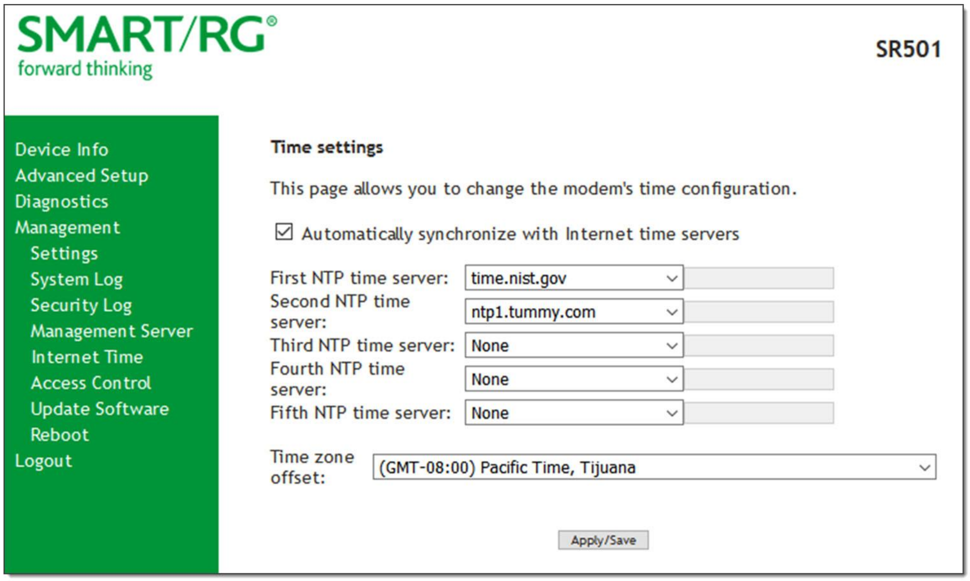


Time settings

This page allows you to change the modem's time configuration.

☐ Automatically synchronize with Internet time servers

2. Click **Automatically synchronize with Internet time servers**. Additional fields appear.



Time settings

This page allows you to change the modem's time configuration.

☑ Automatically synchronize with Internet time servers

First NTP time server: time.nist.gov
Second NTP time server: ntp1.tummy.com
Third NTP time server: None
Fourth NTP time server: None
Fifth NTP time server: None

Time zone offset: (GMT-08:00) Pacific Time, Tijuana

3. Select the desired time servers.
4. Select the **Time zone offset**.
5. Click **Apply/Save** to save and apply your settings.
6. To disable this feature, click the **Automatically synchronize with Internet time servers** check box to clear it.
7. Click **Apply/Save**.

Access Control

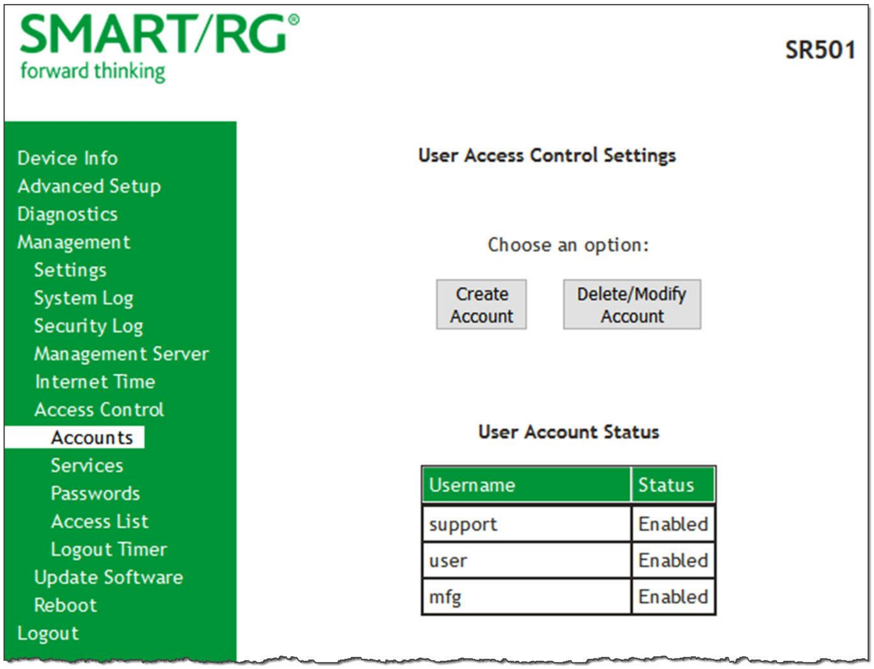
In this section, you can manage access to your gateway and network. You can configure passwords, accounts, services, the logout timer, and access lists.

Accounts

On this page, you can create and manage user accounts for your gateway. Your gateway can support multiple login accounts for its on-board user interface. Each account can be customized to grant access privileges to specific pages in the interface. This is particularly useful when an ISP wishes to limit access for subscribers, yet grant full access for technical support and on-site installation personnel.

Add an Account

1. In the left navigation bar, click Management > Access Control > Accounts. The following page appears.



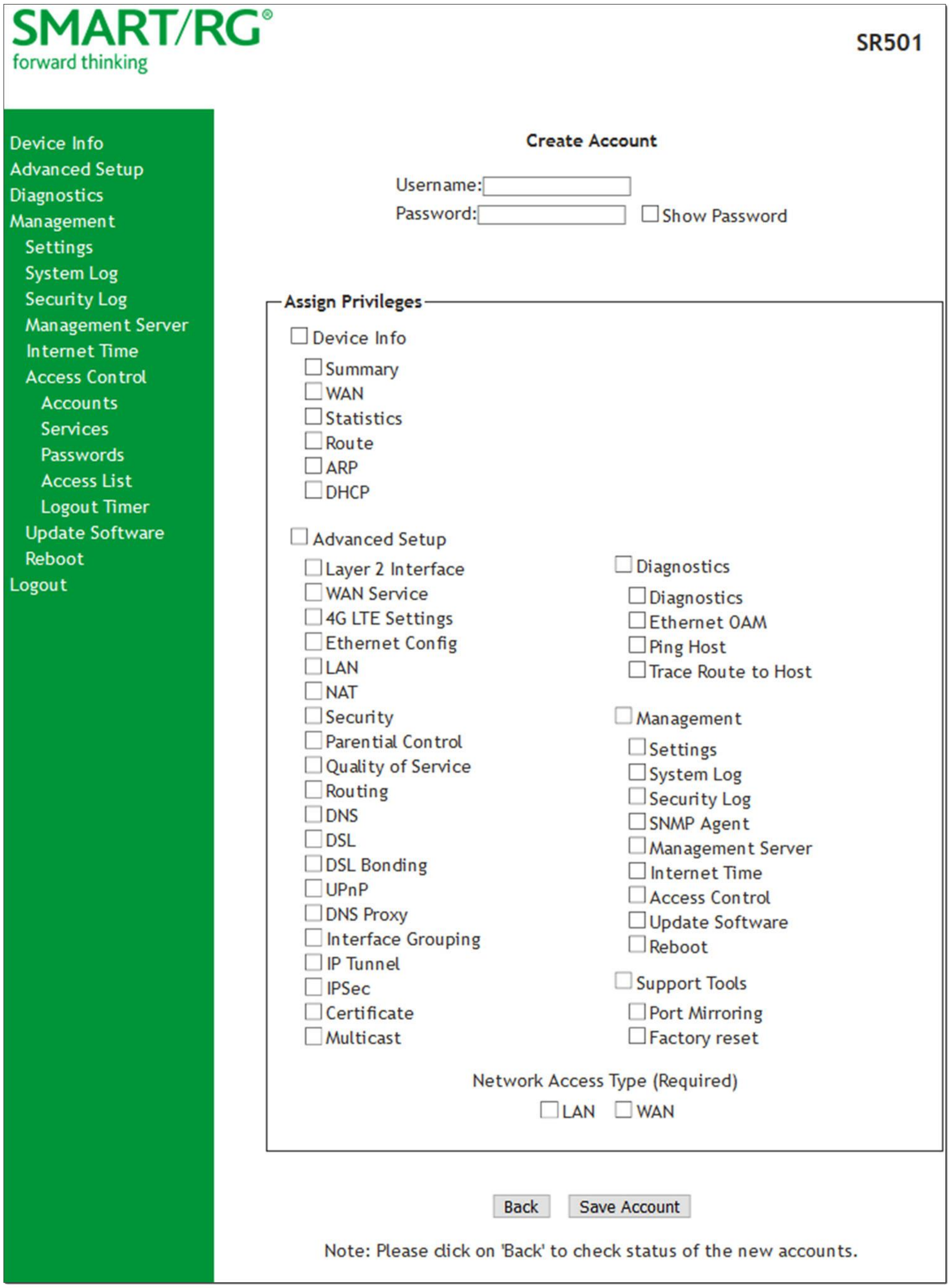
User Access Control Settings

Choose an option:

User Account Status

Username	Status
support	Enabled
user	Enabled
mfg	Enabled

2. To set up a new user, click **Create Account**. The following page appears.



Create Account

Username: ▭
Password: ▭ □ Show Password

Assign Privileges

□ Device Info
- □ Summary
- □ WAN
- □ Statistics
- □ Route
- □ ARP
- □ DHCP

□ Advanced Setup
- □ Layer 2 Interface
- □ WAN Service
- □ 4G LTE Settings
- □ Ethernet Config
- □ LAN
- □ NAT
- □ Security
- □ Parential Control
- □ Quality of Service
- □ Routing
- □ DNS
- □ DSL
- □ DSL Bonding
- □ UPnP
- □ DNS Proxy
- □ Interface Grouping
- □ IP Tunnel
- □ IPSec
- □ Certificate
- □ Multicast

□ Diagnostics
- □ Diagnostics
- □ Ethernet OAM
- □ Ping Host
- □ Trace Route to Host

□ Management
- □ Settings
- □ System Log
- □ Security Log
- □ SNMP Agent
- □ Management Server
- □ Internet Time
- □ Access Control
- □ Update Software
- □ Reboot

□ Support Tools
- □ Port Mirroring
- □ Factory reset

Network Access Type (Required)
□ LAN □ WAN

[Back] [Save Account]

Note: Please dick on 'Back' to check status of the new accounts.

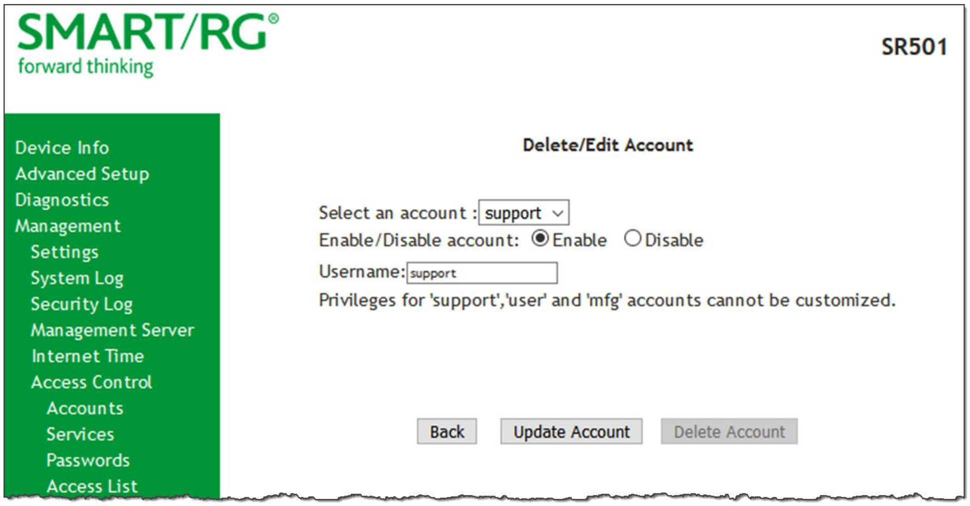
3. Enter a **Username** and **Password** for the new account.
4. Select the features that you want this user to access. If you select a category, the subordinate boxes are also selected. For example, if you select **Support Tools**, **Port Mirroring** and **Factory Reset** are selected as well.

5. Click **Save Account** to commit your changes. The new account is created. To test the account credentials, log out of the interface and then log back in using the new account.

Modify or Delete an Account

Note: You can NOT delete the default user accounts (Admin, Support, MFG, or User) but you can disable all but the Admin accounts. The default passwords for the default user accounts are listed in the "Default Passwords" section of this topic.

1. Make sure you are logged into the gateway as an Admin or Support user.
2. In the left navigation bar, click **Management** > **Access Control** > **Accounts** and then click **Delete/Modify Account**. The Delete/Edit Account page appears.



Delete/Edit Account

Select an account : support

Enable/Disable account: ● Enable ○ Disable

Username: support

Privileges for 'support','user' and 'mfg' accounts cannot be customized.

3. In the **Select an account** field, select the account you wish to modify or delete.
4. Do one of the following:
   a. To disable or enable the account, click the appropriate **Enable/Disable account** button and then click **Update Account** (at the borrom of the page).
   b. To modify the account, check or clear the check boxes for the privileges as needed, and then click **Update Account** to commit your changes.
   c. To delete the account, click **Delete Account**. A confirming message appears. Click **OK**.

Your changes are implemented immediately.

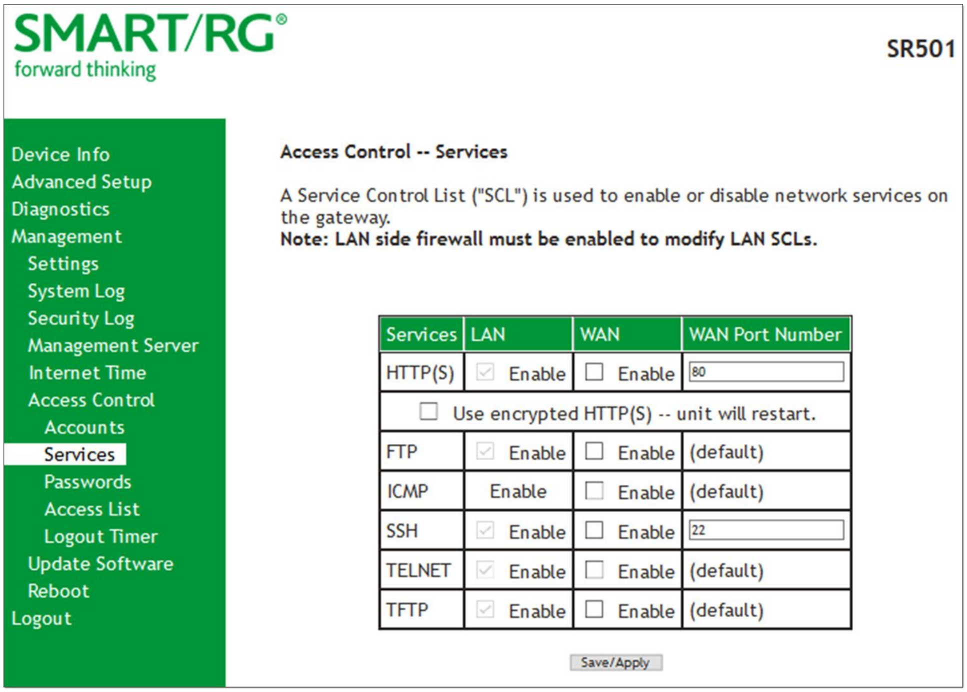
Default Passwords

USER	PASSWORD
admin	admin
support	support
user	user
mfg	IDH7iw@ibRsPOIBa

Services

On this page, you can define a Service Control List to control which services (FTP, HTTP, Telnet, etc.) are restricted on the LAN.

1. In the left navigation bar, click **Management** > **Access Control** > **Services**. The following page appears.



Access Control -- Services

A Service Control List ("SCL") is used to enable or disable network services on the gateway.
Note: LAN side firewall must be enabled to modify LAN SCLs.

Services	LAN	WAN	WAN Port Number
HTTP(S)	☑ Enable	□ Enable	80
□ Use encrypted HTTP(S) -- unit will restart.			
FTP	☑ Enable	□ Enable	(default)
ICMP	Enable	□ Enable	(default)
SSH	☑ Enable	□ Enable	22
TELNET	☑ Enable	□ Enable	(default)
TFTP	☑ Enable	□ Enable	(default)

2. Modify settings as needed, using the information in the following table.
3. Click **Save/Apply** to commit your settings.

The fields on this page are explained in the following table.

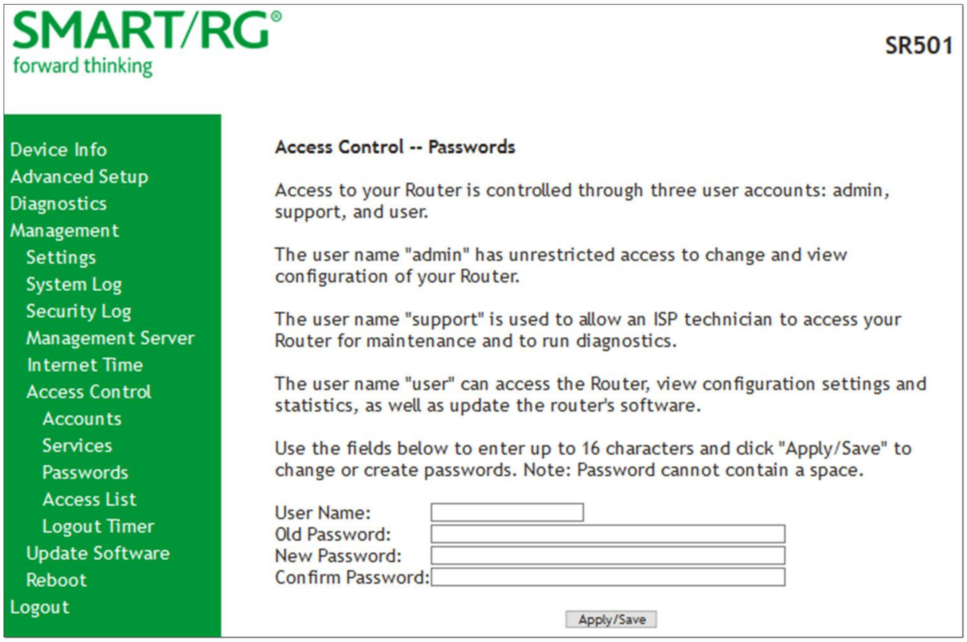
Field Name	Description
Services	Select the SCL services that you want to be enabled. Options are **FTP**, **HTTP**, **ICMP**, **SNMP**, **SSH**, **TELNET**, and **TFTP**.
Use encrypted HTTP(S)	Click this checkbox to implement secured HTTP. **Warning:** When you click this option, the gateway reboots.
LAN	Select the services enabled on LAN side firewall. Depending on configuration settings made elsewhere in the GUI, this column may be read-only. **Note:** ICMP is an always-enabled service by default and has no checkbox.
WAN	If a WAN service is configured for your gateway, select the services enabled on the WAN

Field Name	Description
	side firewall. If no WAN service is configured, this column does not appear.
WAN Port Number	Enter the port to which the access control applies on the WAN side for the given service. Except where noted below, the service ports are the default ports for the WAN.

Passwords

On this page, you can create or change passwords associated with access to the gateway. Three accounts are available to manage: Admin, Support and User.

1. In the left navigation bar, click Management > Access Control > Passwords. The following page appears.



Access Control -- Passwords

Access to your Router is controlled through three user accounts: admin, support, and user.

The user name "admin" has unrestricted access to change and view configuration of your Router.

The user name "support" is used to allow an ISP technician to access your Router for maintenance and to run diagnostics.

The user name "user" can access the Router, view configuration settings and statistics, as well as update the router's software.

Use the fields below to enter up to 16 characters and click "Apply/Save" to change or create passwords. Note: Password cannot contain a space.

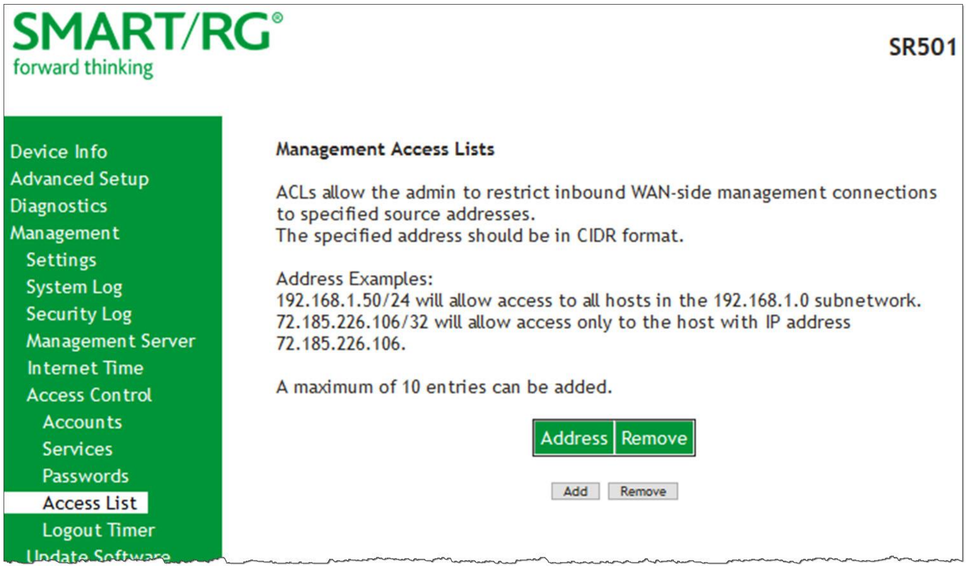
User Name:
Old Password:
New Password:
Confirm Password:

2. Enter your user name and current passwor.
3. In the New Password and Confirm Password fields, enter the new password.
4. Click Apply/Save to implement the change.

Access List

On this page, you can create and manage access control lists to control inbound access to specific IP addresses.

1. In the left navigation bar, click Management > Access Control > Access List. The following page appears, showing any addresses already configured for managed access.



Management Access Lists

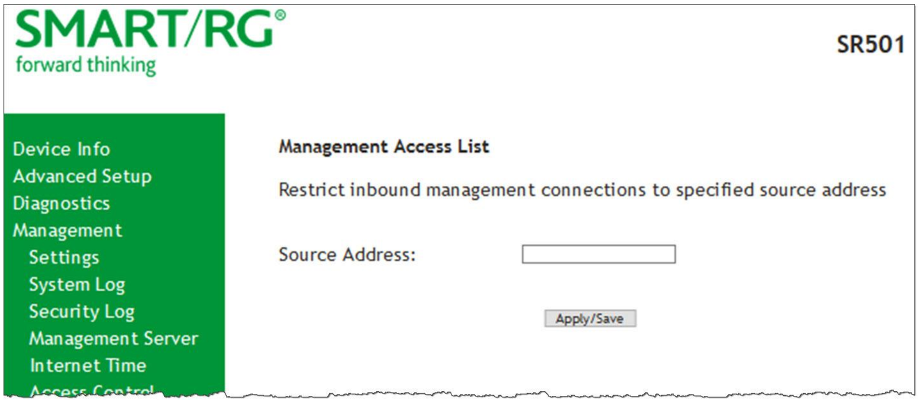
ACLs allow the admin to restrict inbound WAN-side management connections to specified source addresses.
The specified address should be in CIDR format.

Address Examples:
192.168.1.50/24 will allow access to all hosts in the 192.168.1.0 subnetwork.
72.185.226.106/32 will allow access only to the host with IP address 72.185.226.106.

A maximum of 10 entries can be added.

Address	Remove

2. To add an address:
   a. Click **Add**. The following page appears.



Management Access List

Restrict inbound management connections to specified source address

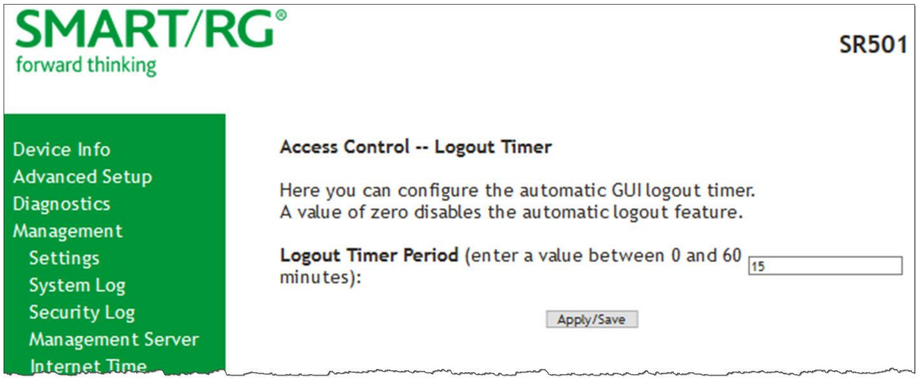
Source Address:

   b. Enter the address for which you want to restrict access.
   c. Click **Apply/Save**. You are returned to the Management Access Lists page.
   d. To add up to 9 more addresses, repeat steps 2a - 2c.
3. To remove an address, click the **Remove** checkbox next to it and then click **Remove**. The list is updated.

Logout Timer

On this page, you can define the maximum time that a session can remain open before the gateway logs out.

1. In the left navigation bar, click Management > Access Control > Logout Timer. The following page appears.



Access Control -- Logout Timer

Here you can configure the automatic GUI logout timer.
A value of zero disables the automatic logout feature.

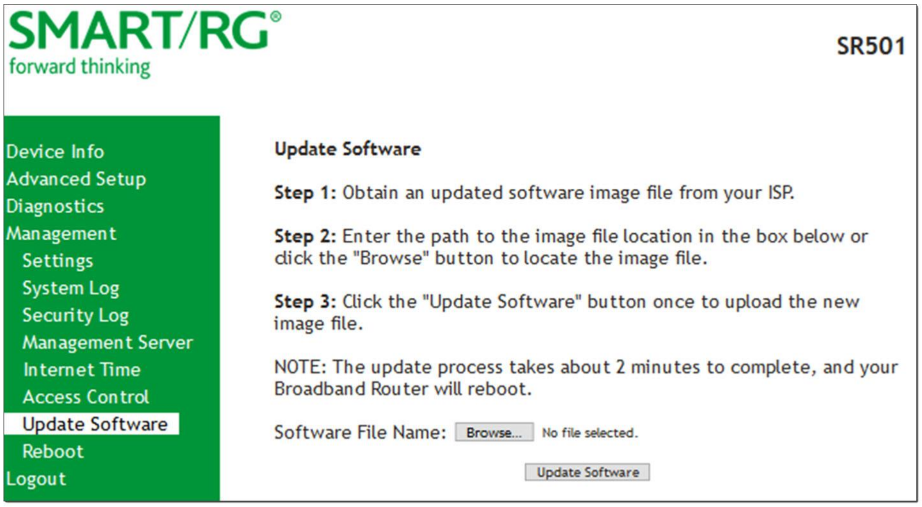
Logout Timer Period (enter a value between 0 and 60 minutes): 15

2. In the Logout Timer Period field, type the number of minutes after which a session will be ended. Options are **0** - **60** minutes. The default is **15** minutes. To disable this feature, enter a zero (**0**) in the field.

Update Software

On this page, you can update the firmware of your SmartRG gateway. Software updates for SmartRG products are available for download by direct customers of SmartRG via the SmartRG Customer Portal.

1. In the left navigation bar, click Management > Update Software. The following page appears.



Update Software

Step 1: Obtain an updated software image file from your ISP.

Step 2: Enter the path to the image file location in the box below or click the "Browse" button to locate the image file.

Step 3: Click the "Update Software" button once to upload the new image file.

NOTE: The update process takes about 2 minutes to complete, and your Broadband Router will reboot.

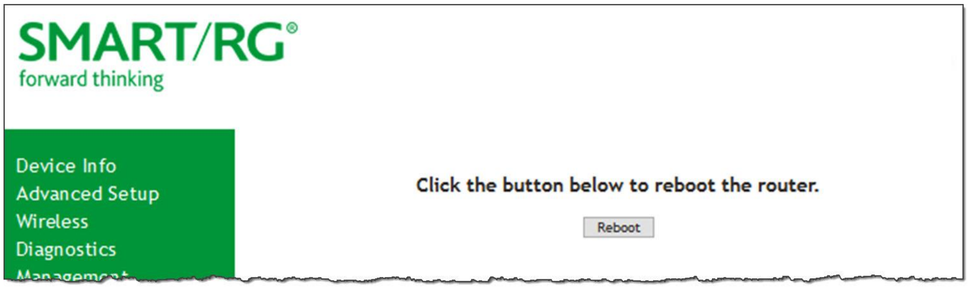
Software File Name: Browse... No file selected.

2. Follow the on-page instructions. When the update has completed, the gateway reboots.

Reboot

Occasionally, troubleshooting measures may require that the gateway be rebooted. On this page, you can reboot your gateway.

1. In the left navigation bar, select **Management** > **Reboot**. The following page appears.

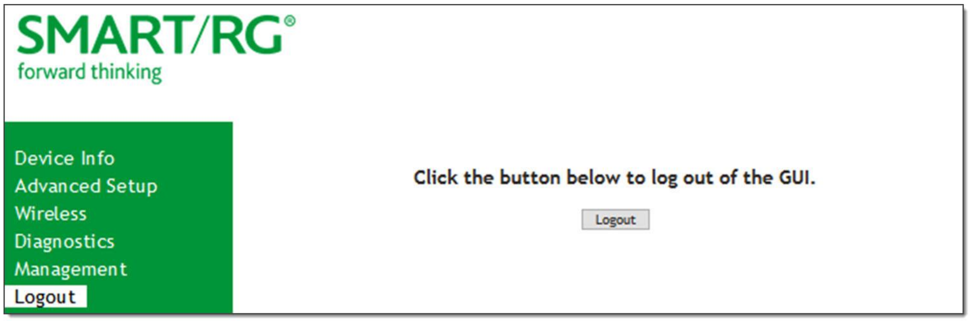


Click the button below to reboot the router.

2. Click **Reboot**. Your gateway is rebooted and you must log in again if you want to make further changes.

Logging Out

1. To log out of your gateway, click **Logout** in the left navigation menu. The logout page appears.



Click the button below to log out of the GUI.

2. Click the **Logout** button. A success message appears.

Appendix C: FCC Statements

This appendix includes the FCC statements that apply to the products described in this User Manual.

FCC - Part 68

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the bottom case of this equipment is a label that contains, among other information, a product identifier in the format US: VW7DL01ASR506N, and REN: NAN for this equipment.

This equipment uses the following USOC jacks: RJ-11/RJ45/USB/Power Jacks!

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.

REN (RINGER EQUIVALENT NUMBERS) STATEMENT

REN=0.1A

Notice: 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.

If this equipment VW7DL01ASR506N 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.

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

If trouble is experienced with this equipment VW7DL01ASR506N , for repair or warranty information, please contact SmartRG,Inc.. 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.

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

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this VW7DL01ASR506N does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

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

IC-CS03 statement

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

The Ringer Equivalence Number (REN) is an indication of the maximum number of devices allowed to be connected to a telephone interface. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices not exceed five. / L'indice d'équivalence de la sonnerie (IES) sert à indiquer le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas cinq.

FCC Statement

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

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment and it also complies with Part 15 of the FCC RF Rules. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and consider removing the no-collocation statement.

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.

Caution! Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canada Statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

This radio transmitter (VW7DL01ASR506N) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

5GHz

5150-5250 MHz band is restricted to indoor operations only.

Revision History

REVISION	DATE	CHANGES
1.3	March 2020	Updated for SmartRG firmware release 2.6.2.4.
1.2	September 2019	Updated for firmware release 2.6.2.3.
1.1	September 2019	Updated for firmware release 2.6.2.2.
1.0	December 2016	Initial release of document.