

User Guide

Model Number RAC2V1A
802.11ac Wave 2 Router



Spectrum▶

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Overview

Introduction

Get ready to experience the Internet's express lane! Whether you're checking out streaming media, downloading new software, or checking your email, the RAC2V1A router brings it all to you faster and more reliably.

The RAC2V1A router provides four Ethernet connections for use as the hub of your home/office Local Area Network (LAN). The RAC2V1A also provides 802.11a/b/g/n/ac wireless connectivity for enhanced mobility and versatility.



Installation is simple, and Spectrum will provide assistance to you for any special requirements.

Product Overview

About The Router

The RAC2V1A router is a dual-band 802.11ac router that allows users to connect to the Internet through a separate modem.

The RAC2V1A router has the following features:

- Remote management capability: allows Spectrum to make changes to the router's configuration
- Convenience: supports Ethernet and 802.11a/b/g/n/ac wireless connections; both wired and wireless connections can be used simultaneously
- Four Gigabit Ethernet ports for connections to non-wireless devices
- A USB 3.0 host port

What's in the Box?

Make sure you have the following items before proceeding. Call Spectrum for assistance if anything is missing.

- Router
- Power Supply
- Spectrum Quick Start Guide
- Two Stickers with Wi-Fi Network Name and Password
- Ethernet Cable
- Safety Insert/License Agreement

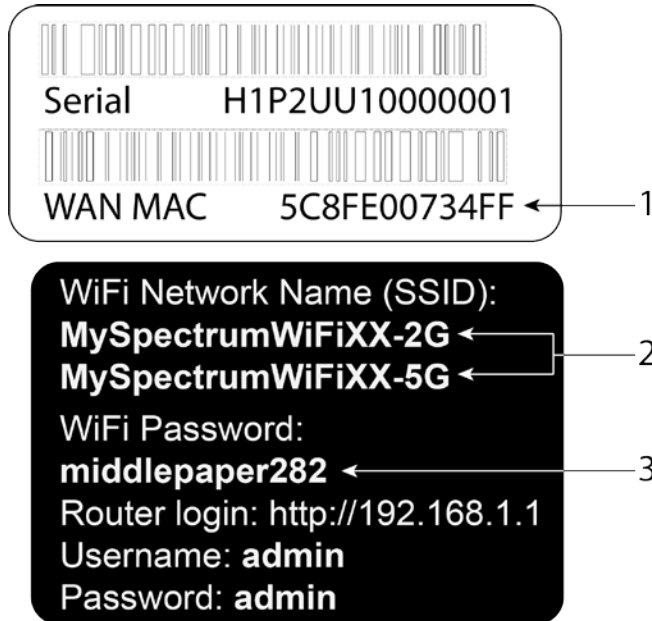
Items You Need

Make sure you have the following items on hand before continuing:

- Router package: see [What's in the Box?](#) (page 7) for a list of items in the package.
- Ethernet Cable: In addition to the Ethernet cable provided, you may need an additional Ethernet cable if you want to connect to wired clients. This is a standard CAT5e Ethernet cable with RJ45 type connectors on both ends. You can buy Ethernet cables from any electronics retailer and many discount stores.
- Spectrum Quick Start Guide: This guide contains information about your service and how to set it up. Read this information carefully and contact Spectrum if you have any questions.

About This Manual

This manual covers the RAC2V1A router. You can find product information on the security label affixed to the back of the router.



1. MAC address
2. Wi-Fi Network Name (SSID). The XX here represents the last octet of the MAC address.
3. Wi-Fi Password

System Requirements

The router operates with most computers and wireless devices. The following describes requirements for each operating system; see the documentation for your system for details on enabling and configuring networking.

To use the router, you need high-speed Internet service from Spectrum.

Recommended Hardware

The following hardware configuration is recommended. Computers not meeting this configuration can still work with the router, but may not be able to make maximum use of available throughput.

- CPU: P4, 3 GHz or faster.
- RAM: 1 GB or greater.
- Ethernet: Gig-E (1000Base-T).
- Wi-Fi: 802.11a, b, g, n, or ac compliant Wi-Fi equipment.

Windows

Windows 7, Windows 8, or Windows 10. A supported Ethernet or wireless LAN connection must be available.

Mac OS

System 7.5 to Mac OS 9.2 (Open Transport recommended), or OS X. A supported Ethernet or wireless LAN connection must be available.

Linux/Unix

Hardware drivers, TCP/IP and DHCP must be enabled in the kernel. A supported Ethernet or wireless LAN connection must be available.

Mobile Devices

Android OS or iOS.

Installing the Router

Before you start, make sure that:

- You have all the [Items You Need](#) (page 6).
- The modem and power outlets are available nearby.

Front Panel

The router has one light, located on the front right corner.



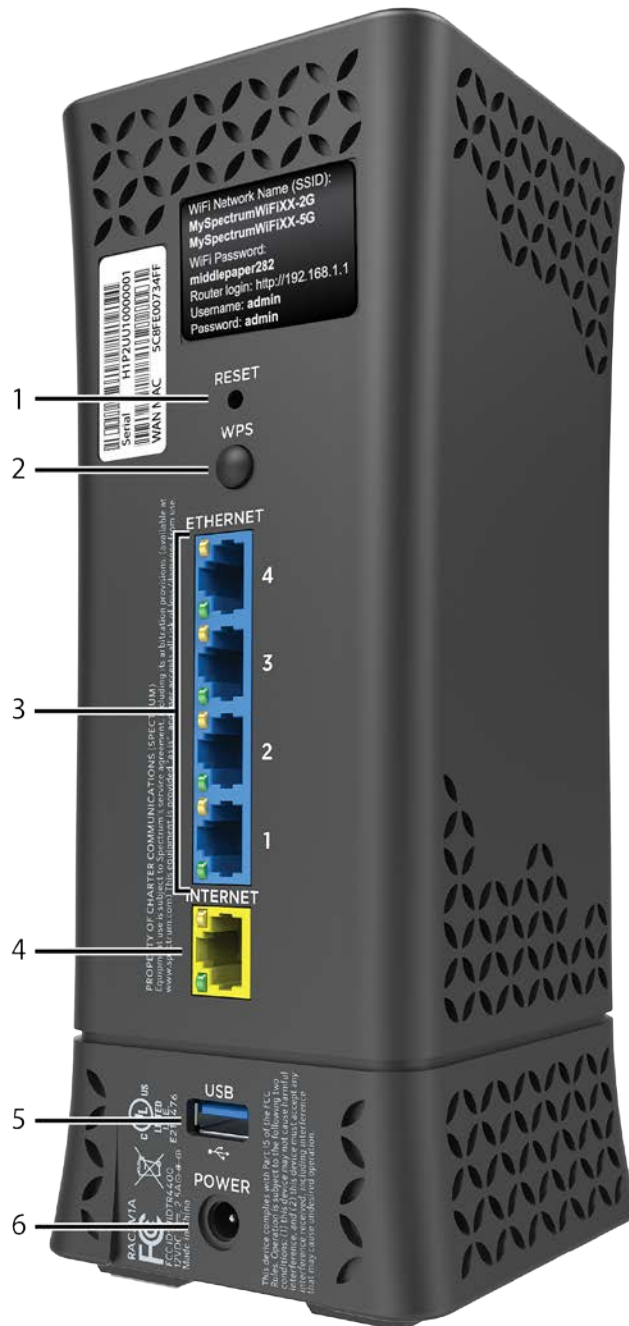
The light on the front of the router indicates the operating status.

- A soft pulsing blue light on the front panel indicates normal operation.
- A pulsing light that alternates blue and red indicates that the router is updating firmware.

- A flashing red light indicates that the router is establishing the internet connection.
- A solid red light indicates that the device was not able to achieve a normal operating state.

Rear Panel

The rear of the router has the following connectors and controls:



1. Reset button: resets the router as if you power cycled the unit. Use a pointed non-metallic object to press this button and hold it for more than one second but less than five seconds.

Note: If you hold the Reset button for more than five seconds, the router will be reset to the factory default settings and will restart. Do *not* perform a factory reset unless you expressly guided to do so by Spectrum customer service.

2. WPS Button: begins associating the router with a wireless device.
3. Ethernet (1 - 4): connectors for use with a computer LAN port or another Ethernet-connected device.
4. Internet: connector to the Spectrum modem.
5. USB: USB host connector for use with external USB devices.
6. Power: connector for the power cord.

Selecting an Installation Location

There are a number of factors to consider when choosing a location to install the router:

- Is an AC outlet available nearby? For best results, the outlet should not be switched and should be close enough to the router that extension cords are not required.
- Is the modem nearby? Can you easily run cables between the router's location and the modem?
- If you are connecting devices to the Ethernet ports, can you easily run cables between the router's location and those devices?
- If you want to install the router on a desktop, is there enough space on either side to keep the vents clear? Blocking the vents may cause overheating.
- How close are the wireless devices? In general, the router should be located centrally within the premises, as close as possible to the location where users will want to access the wireless connection. The router wireless connection range is typically 100–200 feet (30m–65m) for 2.4 GHz signals and less for 5 GHz signals. A number of factors can affect connection range, as described below.

Desktop Mounting Instructions

Position the router so that:

- Air flows freely around it

- The back faces the nearest wall
- It will not fall to the floor if bumped or moved
- The sides of the unit are not blocked.

Factors Affecting Wireless Range

A number of factors can affect the usable range for wireless connections.

Increases range	<ul style="list-style-type: none">• Locating the unit centrally• Creating as much "line-of-sight" as possible with client devices
Decreases range	<ul style="list-style-type: none">• Metal or concrete walls between the router and other client devices• Large metal appliances, aquariums, or metal cabinets between the router and other client devices• Interference and RF noise (2.4 GHz wireless phones, microwave ovens, wireless speaker/receiver systems, or other wireless networks)• Placing the router in a cabinet or other enclosed space• Placing the router next to a desktop computer

Notes:

- It may be acceptable to decrease the range of the wireless network, as long as the decreased range is sufficient for your needs. By limiting the network's range, you reduce interference with other networks and make it harder for unwanted users to find and connect to the network.
- Setting the transmit power level to High increases the range. Setting it to Medium or Low decreases the range. Medium or Low may be more appropriate for high-density residential locations.

Ethernet or Wireless?

There are two ways to connect the computer (or other equipment) to the router. The following will help you decide which is best for you:

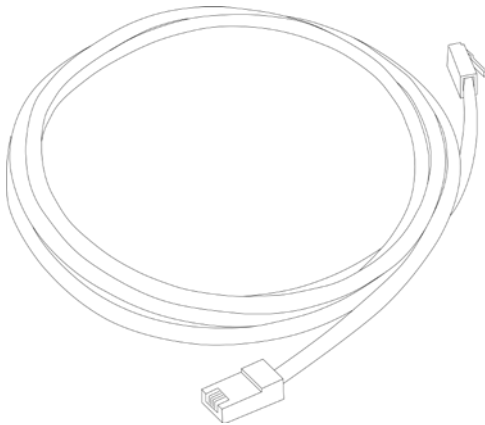
Ethernet

Ethernet is a standard method of connecting two or more computers into a Local Area Network (LAN). You can use the Ethernet connection

if the client device has built-in Ethernet hardware. The router provides support for up to four such connected devices.

Note: To connect more than four client devices to the router through the Ethernet ports, you need an Ethernet switch (available at computer retailers).

The router includes one 3-foot (.9m) Ethernet cable. The enclosed Ethernet cable is yellow to match the Internet port on the back of the router, because this cable is primarily intended to connect the router to the Spectrum modem. You can purchase more cables if necessary at a computer retailer. If you are connecting the router directly to a computer, or to an Ethernet switch with a cross-over switch, ask for Category 5e (CAT5e) straight-through cable. CAT5e cable is required for gigabit Ethernet (Gig-E), not regular CAT5 cable.



Wireless

Wireless access lets you connect additional (wireless-capable) devices to the router. The 802.11 wireless LAN standard allows one or more computers to access the router using a wireless (radio) signal. These connections are in addition to the connections supported via Ethernet.

Both

If you have two or more clients, you can use Ethernet for up to four devices and wireless for the others.

Connecting the Router

1. Unplug the power to turn off the modem.
2. Connect one end of the Ethernet cable (included) to the modem, and the other end to the Internet port on the router.
3. Reconnect the plug on the modem to turn the modem back on. Wait approximately 2 minutes to allow the modem to fully power up.

4. Connect the power adapter (included) to the power connector on the back of the router, and then connect the power adapter to an available AC outlet. Wait until the light on the front panel of the router turns blue and begins to pulse.
5. To manage the setup of the router, you can use a second Ethernet cable (not provided) to connect a computer to an available LAN port on the router, or you can connect wirelessly by using the preset wireless security settings printed on the security label located on the back of the router.
6. Open a browser on the computer to access the management interface of the router. If the webpage does not display correctly, try another browser. See [Accessing the Configuration Interface](#) (page 15) for more information.

Configuring the Wireless Connection

The router ships with a secure Wi-Fi network name (SSID) that is unique for every device. By default, the router is set to the most current wireless security setting, WPA2, to provide maximum protection for Wi-Fi devices connected to the router. Wi-Fi network information is located on the label on the back of the router. You can sign in to the router and configure additional wireless settings.

See [Configuring the Wireless Network](#) (page 16) for complete instructions on configuring the wireless connection.

Getting Support

Please contact Spectrum if you need assistance.

Basic Configuration

The router ships with a basic factory default configuration that should allow you to immediately access the Internet after installing the hardware according to the instructions in this guide.

If you need to modify the router's default basic settings, or if you want to configure advanced settings, refer to the appropriate instructions in this document.

Wireless LAN Default Security Setting: The router ships with wireless LAN security set by default. See the security label on the product for the factory security settings: Wi-Fi network name (SSID) and Wi-Fi password.

If you need to modify the router's default wireless security settings, or if you want to configure any other settings, refer to the appropriate instructions in this document.

Note: You may set up the computer and other client devices to work with the security settings on the router. Most client devices support the WPA2 default security standard in the router. Refer to the documentation for the client device for instructions on setting security. If the computer or client device supports Wi-Fi Alliance WPS (Wireless Protected Setup), activate WPS on the computer or client device and the router simultaneously to easily set up the Wi-Fi security.

Accessing the Configuration Interface

Perform the following steps to access the configuration interface.

1. If security has been properly set up on the computer to access the wireless LAN on the router, use the connection utility for the operating system to connect to the wireless LAN using its Wi-Fi network name (SSID), as shown on the security label.

Note: If you cannot access the wireless LAN, you must first establish a wired Ethernet connection between the computer and the router.

2. In the web browser, open the page <http://192.168.1.1/> to access the router setup. The sign-in screen for the router displays.

3. Enter the user name and password, and click Apply to sign in. These default sign-in credentials appear on the label on the back of the router. The Basic Wireless Settings screen displays.

Note: The default user name and the default password are both “admin”. Both are in lower case letters.

4. Set basic setup configuration parameters as required for the system.

Note: Most configuration parameters that you may want to set can be accessed on the Basic Wireless Settings screen or on the LAN Setup or Wireless tabs.

Configuring the Wireless Network

Perform the following steps to make the basic configuration settings for the wireless network.

Enabling or Disabling the Wireless Network.

By default, the router is shipped with a default Wi-Fi network name and Wi-Fi password for both 2.4 GHz and 5 GHz, as well as WPA2 security. You can find this network name and password on the label on the back of your router.

Perform the following steps to disable or re-enable the wireless network.

1. Access and sign in to the configuration interface.
2. Click the Basic Setup tab.
3. Click the Enable SSID checkbox in either the Wireless 2.4 GHz section or the Wireless 5 GHz section to enable wireless networking for that frequency.
4. Click Apply.

Changing the Administrator Password

You should change the administrator password to something other than the default password so that unauthorized users cannot access your configuration interface.

Note: When you first set up your router, the default user name and the default password are both “admin”. Both are in lower case letters.

Perform the following steps to change the administrator password.

1. Access and sign in to the configuration interface. See [Accessing the Configuration Interface](#) (page 15) for more information.
2. Click the Utilities tab.

3. Click System Settings in the side menu.
4. Enter the current administrator password in the Current Password field.
5. Enter the new administrator password in both the New Password and Confirm New Password fields.

Note: Administrator passwords are case-sensitive and must be between 8-12 characters long. You can use any alphanumeric characters (digits 0-9 and letters A-Z, either upper- or lower-case) and printable special characters (such as \$, !, ?, &, #, @ and others).

6. Click Apply.
7. Record your new administrator password here: _____

Changing the Default Wi-Fi Network Name (SSID) and Password

Perform the following steps to change the 2.4 GHz and/or 5 GHz Wi-Fi network name and password.

1. Access and sign in to the configuration interface.
2. Click the Basic Setup tab.
3. On the Basic Wireless Settings screen, enter a unique user-friendly name to identify the Wi-Fi network in the Wi-Fi Network Name (SSID) field under either Wireless 2.4 GHz or Wireless 5 GHz.

Note: This name is also referred to as the Service Set Identifier (SSID). The name can be up to 32 characters long. Do not duplicate any other Wi-Fi network names (SSIDs that may be operating in the area).

4. Enter a new password in the Password (Network Key) field. Valid characters are the numbers 0 to 9, the letters a through z and A through Z and printable characters (such as \$, !, ?, &, #, @ and others).
5. Click Apply at the bottom of the screen.
6. Record the new network names and passwords here:

2.4 GHz Wi-Fi Network name (SSID): _____

2.4 GHz Password: _____

5 GHz Wi-Fi Network name (SSID): _____

5 GHz Password: _____

Configuring Wi-Fi Protected Setup (WPS)

WPS is a standard method for easily configuring a secure connection between the router and computers or other wireless devices (known as enrollees) that support WPS. When WPS is enabled you can attach other wireless devices by pressing the WPS buttons on the device (if equipped) and on the router, or by entering the enrollee's PIN and then clicking the Start WPS Association icon.

Perform the following steps to enable the wireless network.

1. Access and sign in to the configuration interface.
2. Click the Basic Setup tab.
3. Click WPS Settings in the side menu.
4. In the appropriate section (2.4 GHz or 5 GHz), click the Wi-Fi Protected Setup (WPS) Enable checkbox and click Apply to enable WPS on the system.
5.
 - a. If the client device has a WPS button, press the WPS buttons on the client device and on the router simultaneously to start the WPS association.

Note: If you prefer, you can click Start PBC on the WPS Settings screen instead of pressing the WPS button on the back of the router.)
 - b. If the client device has a PIN number, enter the enrollee's PIN in the Enrollee PIN Code field, and then click Enroll. Enter the router's PIN code in the Device PIN Code field if requested during connection.
6. If the connection is successful, then the device will connect to the router. If it does not connect for some reason, then you should start the association process over.

Setting Up the Internet/WAN Connection

A Dynamic or DHCP (Dynamic Host Configuration Protocol) connection is the most commonly used WAN connection type.

Note: Do not change this setting unless Spectrum tells you to use another connection type.

Perform the following steps to change the connection type.

1. Access and sign in to the configuration interface.
2. Click the WAN Setup tab.
3. Click Dynamic (IPv4), Static (IPv4), Dynamic (IPv6), or Static (IPv6) in the side menu to display the appropriate screen for configuring that type of WAN connection.
4. Set the required configuration parameters for the connection type you selected as provided by Spectrum.

Note: Refer to WAN Setup in [Router Configuration Screen Descriptions](#) (page 28) for specific instructions on setting the various connection type configuration parameters.

5. Click Apply at the bottom of the screen.

Advanced Configuration Options

This section explains how to use the most common advanced configuration options for the router in the following areas:

- LAN Setup
- Wireless Setup
- Firewall
- Utilities

Note: Refer to [Router Configuration Screen Descriptions](#) (page 28) for additional advanced configuration options.

Configuring DHCP

DHCP (Dynamic Host Protocol Configuration) is enabled by default on the router, which allows the router to act as a DHCP server and automatically assign an IP address to each device on the network.

DHCP is a set of rules used by devices such as a computer, router, or network adapter to allow the device to request and obtain an IP address from a server, which maintains a list of addresses available for use. The DHCP server ensures that all IP addresses are unique, e.g., no IP address is assigned to a second device while the first device's assignment is valid (its lease has not expired).

Without DHCP, the IP addresses must be entered manually at each computer or device and a new IP address must be entered each time it moves to a new location on the network.

Configuring DHCP for IPv4

Perform the following steps to configure DHCP for IPv4.

1. Access and sign in to the configuration interface.
2. Click the LAN Setup tab.
3. Click LAN Settings (IPv4) in the side menu to display the LAN Settings screen.
4. Click the Enable DHCP Server checkbox under DHCP Server Settings.

5. Enter the Start IP Address and End IP Address for the range of IP addresses that the DHCP Server running on the route will be allowed to assign to a network device.
6. In the Lease Time field, select the time before the assigned IP address will expire. (After the lease time is up, the user is automatically assigned a new dynamic IP address.)
Note: Refer to [LAN Setup](#) (page 39) for specific instructions on setting the various DHCP configuration parameters.
7. Click Apply at the bottom of the screen.

Configuring DHCP for IPv6

Perform the following steps to configure DHCP for IPv6.

1. Access and sign in to the configuration interface.
2. Click the LAN Setup tab.
3. Click LAN Settings (IPv6) in the side menu to display the LAN Settings screen.
4. Click the Enable checkbox under LAN Settings (IPv6).
5. Enter the Start IP Address and End IP Address for the range of IP addresses that the DHCP Server running on the route will be allowed to assign to a network device.
6. In the Lease Time field, select the time before the assigned IP address will expire. (After the lease time is up, the user is automatically assigned a new dynamic IP address.)
Note: Refer to [LAN Setup](#) (page 39) for specific instructions on setting the various DHCP configuration parameters.
7. Click Apply at the bottom of the screen.

Adding and Deleting Reserved DHCP Clients

The Client List screen shows the IP address, host name and MAC address of each computer that is connected to the network. If a computer does not have a specified host name, then the host name field will be blank.

Perform the following steps to configure the DHCP Clients.

1. Access and sign in to the configuration interface.
2. Click the LAN Setup tab.

3. Click Client List in the side menu to display the Client List screen.
4. Click Add to add a reserved IP client. Select an existing DHCP client and then click Delete to delete the reserved IP for the client. Click Refresh to update the Attached Client List.

Selecting the NAT Mode

NAT (Network Address Translation) allows the router to manipulate IP addresses so that just one single IP address can represent an entire group of computers on the network and let them all communicate with the Internet. This conserves IP addresses and is necessary in IPv4 since there are a limited number of available IP addresses for use. (This limitation does not affect the IPv6 address space.)

Perform the following steps to select the NAT Mode.

1. Access and sign in to the configuration interface.
2. Click the LAN Setup tab.
3. Click LAN Settings (IPv4) in the side menu to display the LAN Settings screen.
4. Select the NAT Mode from the NAT Mode field drop-down list. The optional modes are:
 - o Bridged: Data will pass through the router directly without any routing and without NAT.
 - o RoutedWithNAT: Data will be routed by the device and all the outgoing packets will be NATed.
 - o RoutedWithoutNAT: Data will be routed by the device but all the outgoing packets will not be NATed.
5. Click Apply at the bottom of the screen.

Note: A dialog box prompts you to restart the router. Click OK to restart.

Setting the Wireless Mode

You can set the wireless mode to optimize performance based on the type of network adapters being used by the client devices (for example, 802.11g, 802.11n or 802.11ac). Select the proper mode to support all of the wireless devices that will connect to the router.

Perform the following steps to set the wireless mode.

1. Access and sign in to the configuration interface.
2. Click the Wireless tab.

3. Click Basic Setup in the side menu to display the Basic Settings screen.
4. Under Wireless 2.4 GHz or Wireless 5 GHz, select the proper mode from the Wireless Mode drop-down list. The following options are available:

2.4 GHz Options:

- o 802.11g
- o 802.11g+n

5 GHz Options:

- o 802.11n
- o 802.11n&802.11ac
- o 802.11ac

Note: Mixed modes will be able operate in more than one mode, depending on the capabilities of the connected device.

5. Click Apply at the bottom of the screen.

Note: If you have both 802.11a and 802.11b running on your network, then clients that are capable of faster wireless modes will be slowed down.

General Firewall Configuration Settings

The router is equipped with a firewall that will protect your network from a wide array of common Denial of Service (DoS) attacks, including Ping of Death (PoD) attacks.

The firewall is enabled by default, but you can choose to disable it. Turning off the firewall protection will not leave the network completely vulnerable to hacker attacks, but it is recommended that you enable the firewall whenever possible.

Perform the following steps if you have disabled the firewall and want to enable it again.

1. Access and sign in to the configuration interface.
2. Click the Firewall tab.
3. Click Firewall Settings in the side menu to display the Firewall Settings screen.
4. Check the Enable Firewall checkbox to enable the firewall on the network.
5. Click Apply at the bottom of the screen.

6. Click WAN Ping Blocking in the side menu to display the WAN Ping Blocking screen.
7. Check the Block ICMP Ping Enable checkbox to protect against PoD attacks.
8. Click Apply at the bottom of the screen.

Port Forwarding

The port forwarding function forwards inbound traffic from the Internet to a specified single device on your network. Examples include allowing access to a web server on your network, peer-to-peer file sharing, applications that allow remote access to a specified computer, some gaming and videoconferencing applications and others.

If you have a server in the network that you want to make available to the Internet, you can set up port forwarding. The firewall passes requests from the Internet to the designated computer on the network. This function works by allowing you to route external (Internet) calls for services such as a web server (port 80), FTP server (Port 21), or other applications through the router to the internal network.

Perform the following steps to set up port forwarding.

1. Access and sign in to the configuration interface.
2. Click the Firewall tab.
3. Click Port Forwarding in the side menu to display the Port Forwarding screen.
4. Select the type of server that you want to add from the Service List drop-down box.
5. Click Add
6. If necessary, adjust the following parameters.

Enable	Enable forwarding for this port.
Description	Enter a name for the port you want to forward.
Inbound Port	Enter the inbound port range for the port you want to forward. It should be the same range as the local port.
Type	Sets the format for the port. Options are TCP, UDP, or BOTH.

Private IP Address	Enter the IP address of the machine on the LAN where you want the connections to go.
--------------------	--

Private Port	Enter the private port range for the port you want to forward. It should be the same range as the inbound port.
--------------	---

7. Click Apply to save your settings.

Note: To stop forwarding a port, uncheck Enable for the forwarding rule, and then click Apply. To completely remove a port forwarding rule, choose the entry, choose the entry ID in the drop-down list and click Clear, then click OK and Apply.

Configuring DMZ for Gaming or Conferencing Applications

The DMZ feature allows you to specify one computer on the network to be placed outside of the NAT firewall. This may be necessary if the NAT feature is causing problems with an application such as a game or video conferencing application.

Use this feature only on a temporary basis. The computer in the DMZ is not protected from hacker attacks.

Perform the following steps to put a computer in the DMZ.

1. Access and sign in to the configuration interface.
2. Click the Firewall tab.
3. Click DMZ in the side menu to display the DMZ screen.
4. Enter the following parameters.

Enable	Click this checkbox to enable DMZ on the network.
Static IP	Displays the router's WAN IP address.
Private IP	Enter the IP address of the computer to be placed in the DMZ. We recommend that you choose a reserved, routable IP address. After placing the computer in the DMZ, all ports on the computer are open to the Internet and not protected.

5. Click Apply at the bottom of the screen.

Note: To remove the computer from the DMZ, uncheck the Enable checkbox and then click Apply.

Viewing Network System Information

You can view status and system information for the network on the System Information screen.

Perform the following steps to view system status information.

1. Access and sign in to the configuration interface.
2. Click the Utilities tab.
3. Click System Information in the side menu to display the System Information screen.

Note: Refer to [System Information](#) (page 79) for an explanation of the various status information parameters.

Restarting the Router

It may be necessary to restart (reset) the router if it stops working properly. This is the equivalent of unplugging power from the router and plugging power back in. Restarting the router will not delete any of the configuration settings.

Perform the following steps to restart the router.

1. Access and sign in to the configuration interface.
2. Click the Utilities tab.
3. Click Restart Router in the side menu to display the Restart Router screen.
4. Click the Restart Router button to restart the router.

Viewing the System Logs

The System Logs screen displays the system logs.

Perform the following steps to configure the system logs.

1. Access and sign in to the configuration interface.
2. Click the Utilities tab.
3. Click System Log in the side menu to display the System Logs.

When viewing the logs, click Refresh to update the list.

Setting Up DDNS

DDNS (Dynamic DNS) allows you to provide Internet users with a fixed domain name (instead of an IP address which may periodically change). This allows various locations on the Internet to access the gateway and

the applications that are set up in the gateway's port forwarding table without knowing your current IP address.

Requirements

In order to use DDNS you must first create an account with a DDNS provider. The DDNS provider maps your chosen domain name to your IP address.

Once the account is established, perform the following steps to enable DDNS.

1. Access and sign in to the configuration interface.
2. Click the Utilities tab.
3. Click DDNS in the side menu to display the DDNS configuration screen.
4. Click the DDNS Enable checkbox.

Note: Refer to [DDNS](#) (page 85) for specific instructions on setting the various DDNS configuration parameters.

5. After setting the necessary configuration parameters, click Apply at the bottom of the screen.

Router Configuration Screen Descriptions

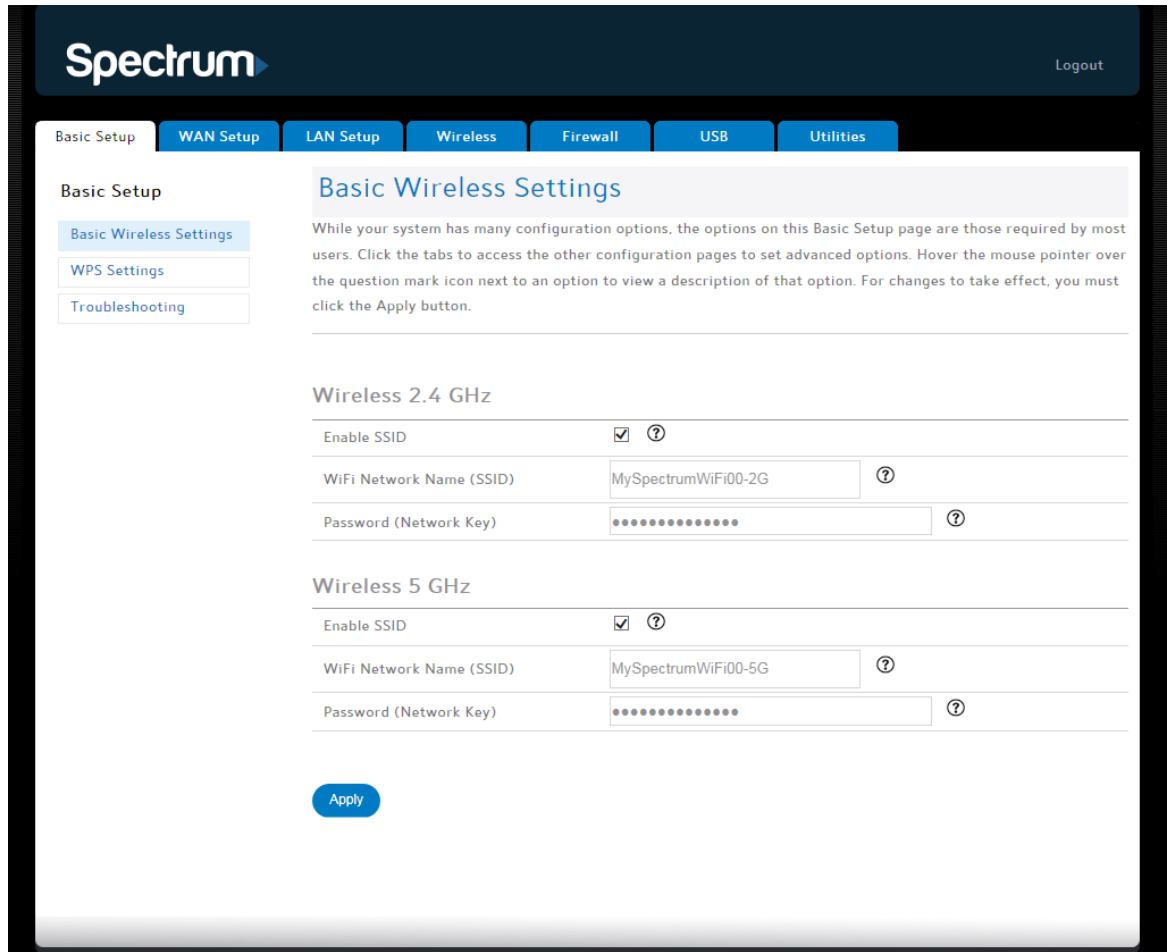
This section provides an overview of the graphical user interface (GUI) router setup screens.

Each of the following tabs in the GUI and their individual sub-menus and configuration parameters are explained in detail:

- Basic Setup
- WAN Setup
- LAN Setup
- Wireless
- Firewall
- USB
- Utilities

Basic Setup

Basic Wireless Settings



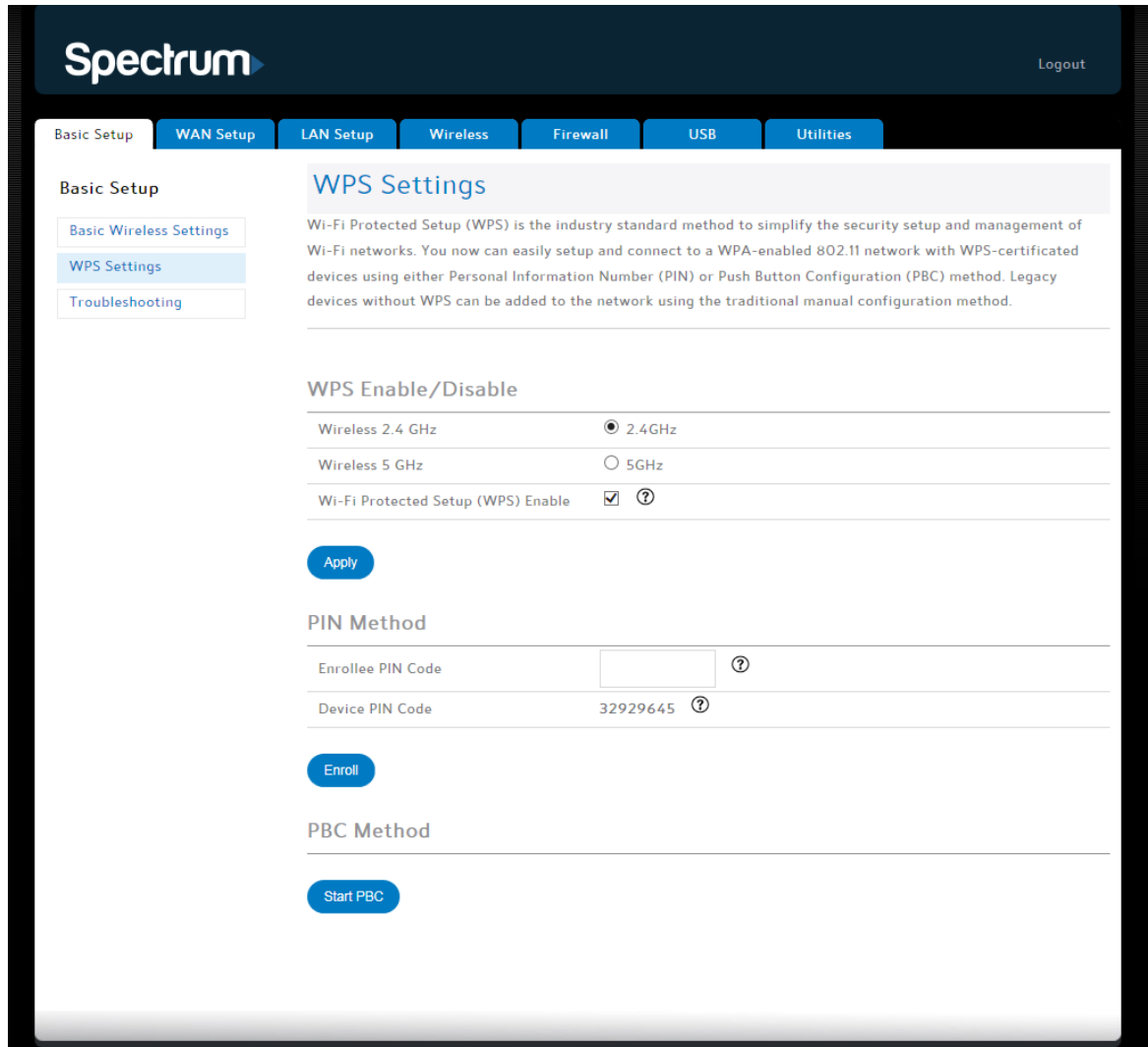
While the system has many configuration options, the options on this Basic Setup page are those required by most users. Click the tabs to access the other configuration pages to set advanced options. Hover the mouse pointer over the question mark icon next to an option to view a description of that option. For changes to take effect, you must click Apply.

Wireless 2.4 GHz/Wireless 5 GHz

Enable SSID	Click this checkbox to enable the wireless network on the system.
Wi-Fi Network Name (SSID)	Enter a user-friendly name to identify the wireless network. This name is also referred to as the Service Set Identifier (SSID). The name can be up to 32 characters long.

Wi-Fi Password	Sets the Wi-Fi password. Use a Wi-Fi password that will not be easy to guess. Wi-Fi passwords are case-sensitive. Valid characters are the numbers 0 to 9, the letters a through z and A through Z and printable special characters (such as \$, !, ?, &, #, @ and others). You must click Apply to save the new Wi-Fi password.
----------------	--

WPS Settings



Wi-Fi Protected Setup (WPS) is the industry standard method to simplify the security setup and management of Wi-Fi networks. You can now easily set up and connect to a WPS-enabled 802.11 network with WPS-certified devices using either a Personal Information Number (PIN) or the Push Button Configuration (PBC) method. Legacy devices without WPS can be added to the network using the traditional manual configuration method.

WPS Enable/Disable

Wireless 2.4 GHz/ Wireless 5 GHz	Click the frequency for which you want to enable WPS.
----------------------------------	---

WPS Enable	Click this checkbox to enable WPS on the system.
------------	--

WPS is a standard method for easily configuring a secure connection between the router and computers or other wireless devices (known as enrollees) that support WPS. When WPS is enabled, you can attach other wireless devices by pressing the WPS buttons on the device (if equipped) and on the router, or by entering the enrollee's PIN and then clicking Enroll.

PIN Method

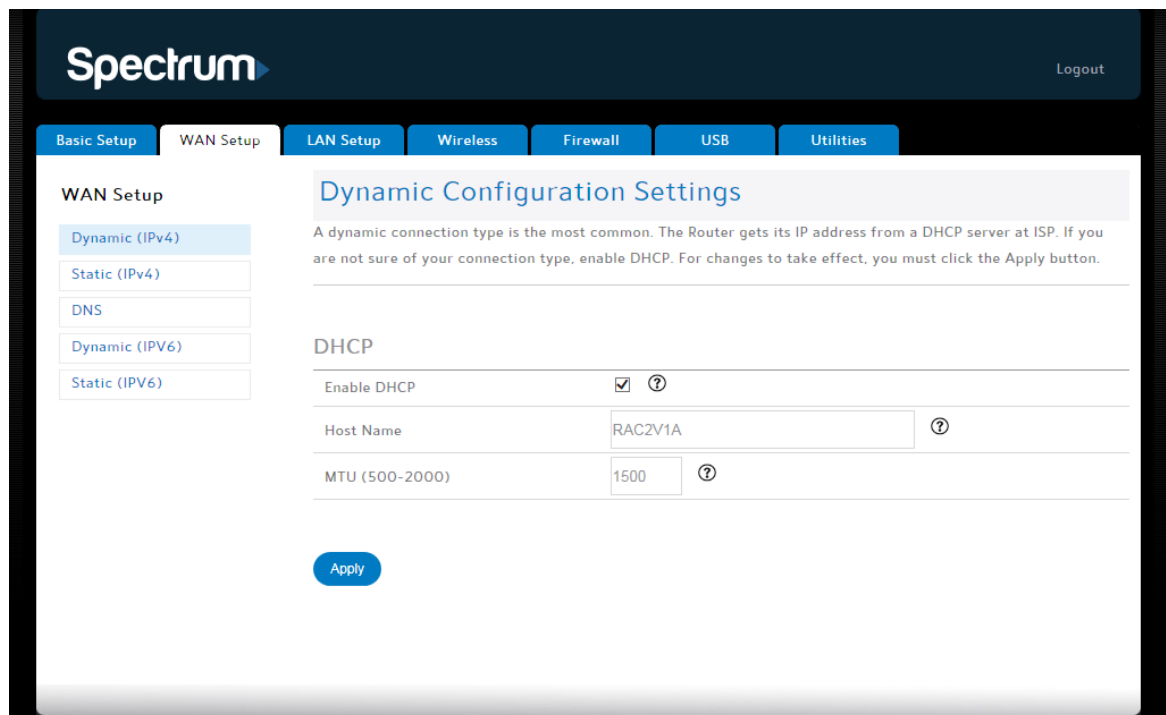
Enrollee PIN Code	If the client device has a WPS PIN number, enter it here, then click Enroll.
Device PIN Code	Enter this code on the computer if requested during connection.

PBC Method

Start PBC	Click to start the PBC connection process. This is equivalent to pressing the WPS button on the back of the router.
-----------	---

WAN Setup

Dynamic Configuration Settings (IPv4)



A dynamic connection type is the most common type of connection. The router gets its IP address from a Spectrum DHCP server. If you are not sure of the connection type, use a dynamic connection. For changes to take effect, you must click Apply.

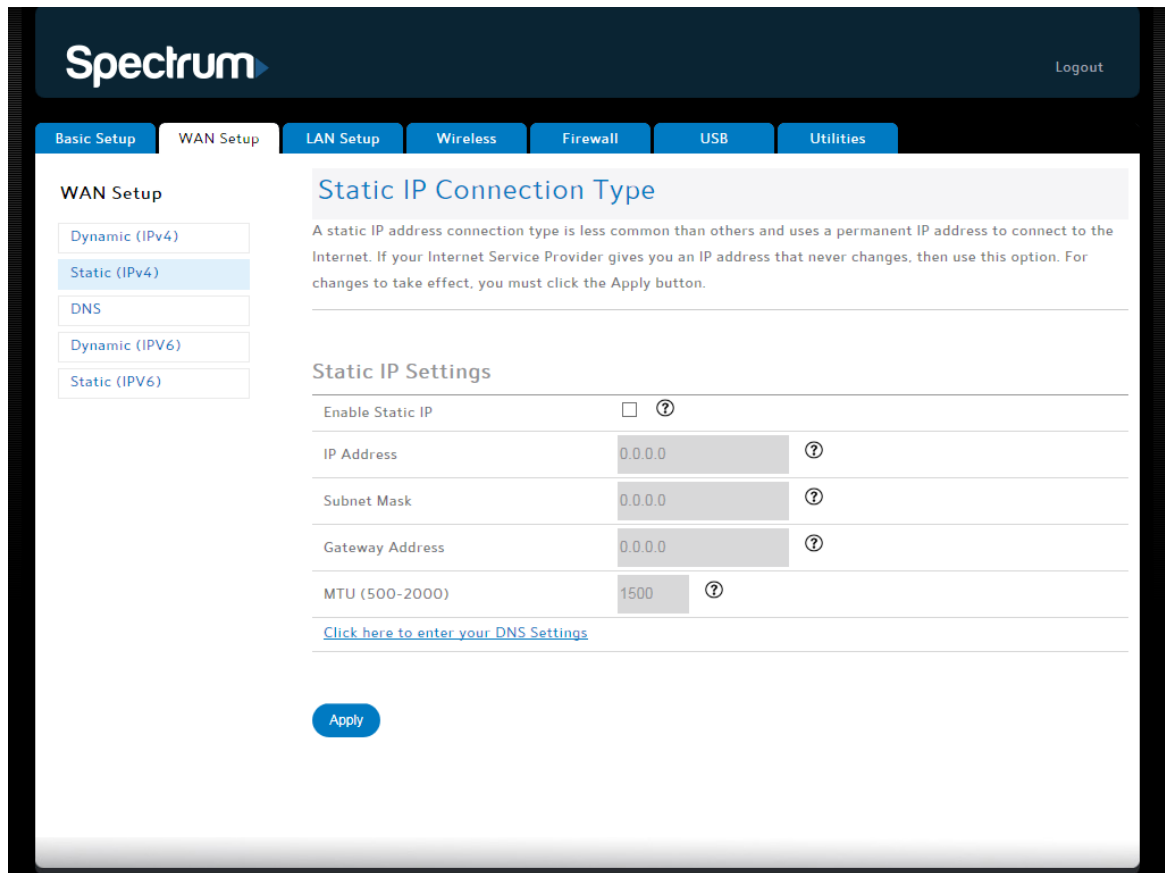
Unless Spectrum directs you to do choose a Static address, you should choose a dynamic address.

Note: You can use static (manual) IP addresses in addition to the DHCP server, but any static addresses must be outside the range of the DHCP pool to avoid duplicate IP addresses. Also, the static WAN IP address must be routable by northern-bound routers.

DHCP

Enable DHCP	Click this checkbox to enable a DHCP connection for the system.
Host Name	Use this field to enter a host name for the router.
MTU	Maximum Transmission Unit. This is a measure of Internet packet size, in bytes, that can be forwarded to the network. You should not change this field unless specifically directed to do so by Charter.

Static IP Connection Type (IPv4)



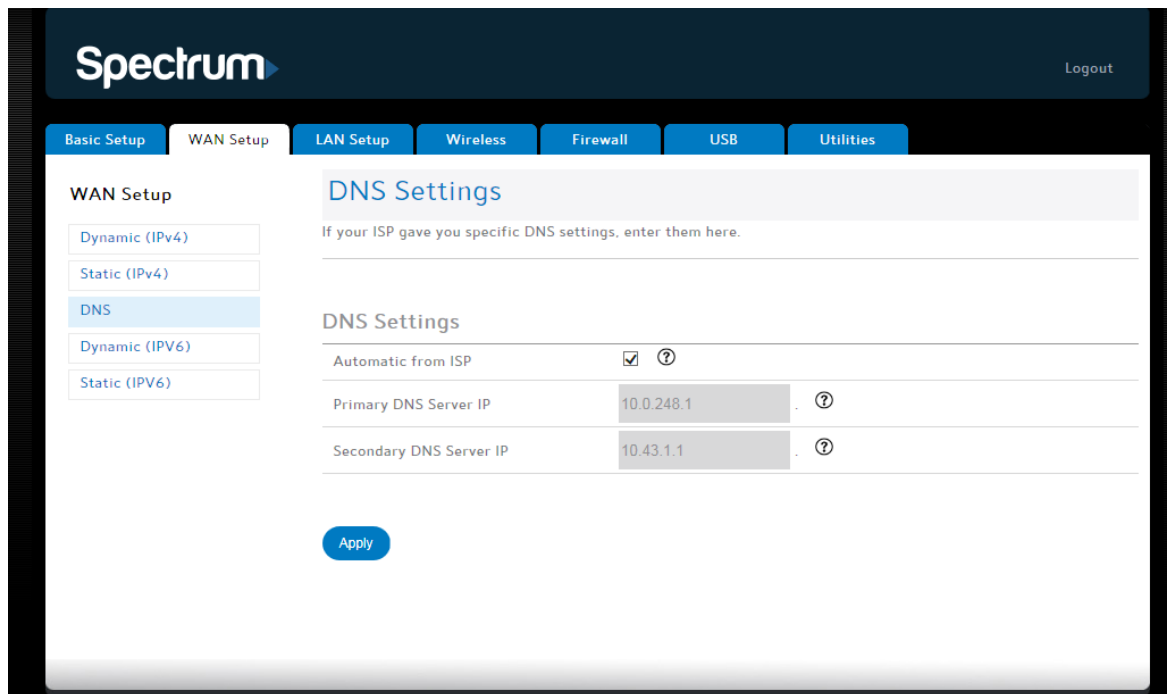
A static IP address connection type is less common than others and uses a permanent IP address to connect to the Internet. If Spectrum provides an IP address that never changes, then use this option. For changes to take effect, you must click Apply.

Static IP Settings

Enable Static IP	Click this checkbox to enable a static IP address connection for the system.
IP Address	Enter the IP address assigned by Spectrum for static IP operation.
Subnet Mask	Enter the subnet mask assigned for the device by Spectrum for static IP operation.
Gateway Address	Enter the gateway address assigned for the device by Spectrum for static IP operation.

MTU	Maximum Transmission Unit. This is a measure of Internet packet size, in bytes, that can be forwarded to the network. You should not change this field unless specifically directed to do so by Charter.
Click here to enter your DNS Settings	If Spectrum gave you specific DNS settings, click here to go to the DNS Settings screen to enter those settings.

DNS Settings

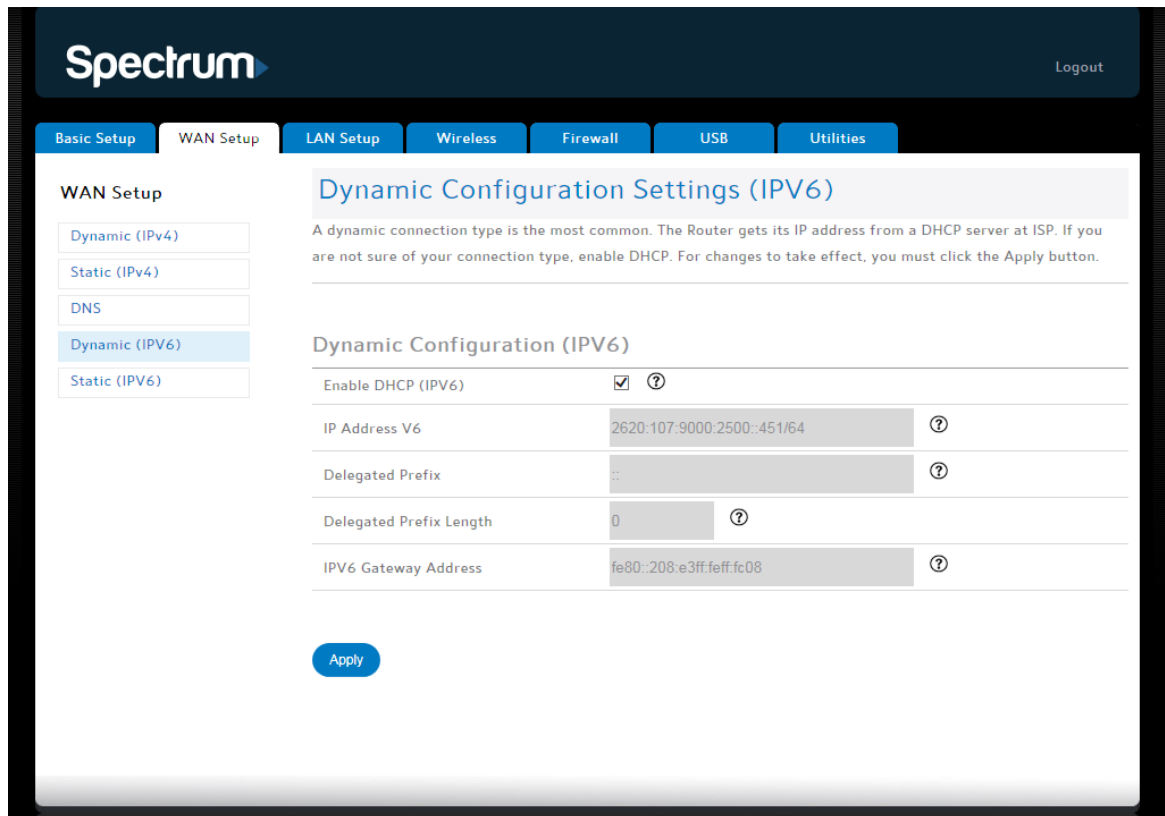


Use this screen to change your DNS settings, if necessary.
 Note: In most cases, you will *not* need to change your DNS settings.

DNS Settings

Automatic from ISP	Click this checkbox if the router should automatically get its DNS settings from Spectrum.
Primary DNS Server IP	Enter the IP address of the primary DNS server. (This field is only available if Automatic from ISP is not checked.)
Secondary DNS Server IP	Enter the IP address of the secondary DNS server. (This field is only available if Automatic from ISP is not checked.)

Dynamic Configuration Settings (IPv6)



This screen enables a DHCPv6 configured IPv6 stack. A dynamic connection type is the most common type of connection. The router gets its IP address from a Spectrum DHCP server. Unless Spectrum directs you to do choose a Static address, you should choose a dynamic address.

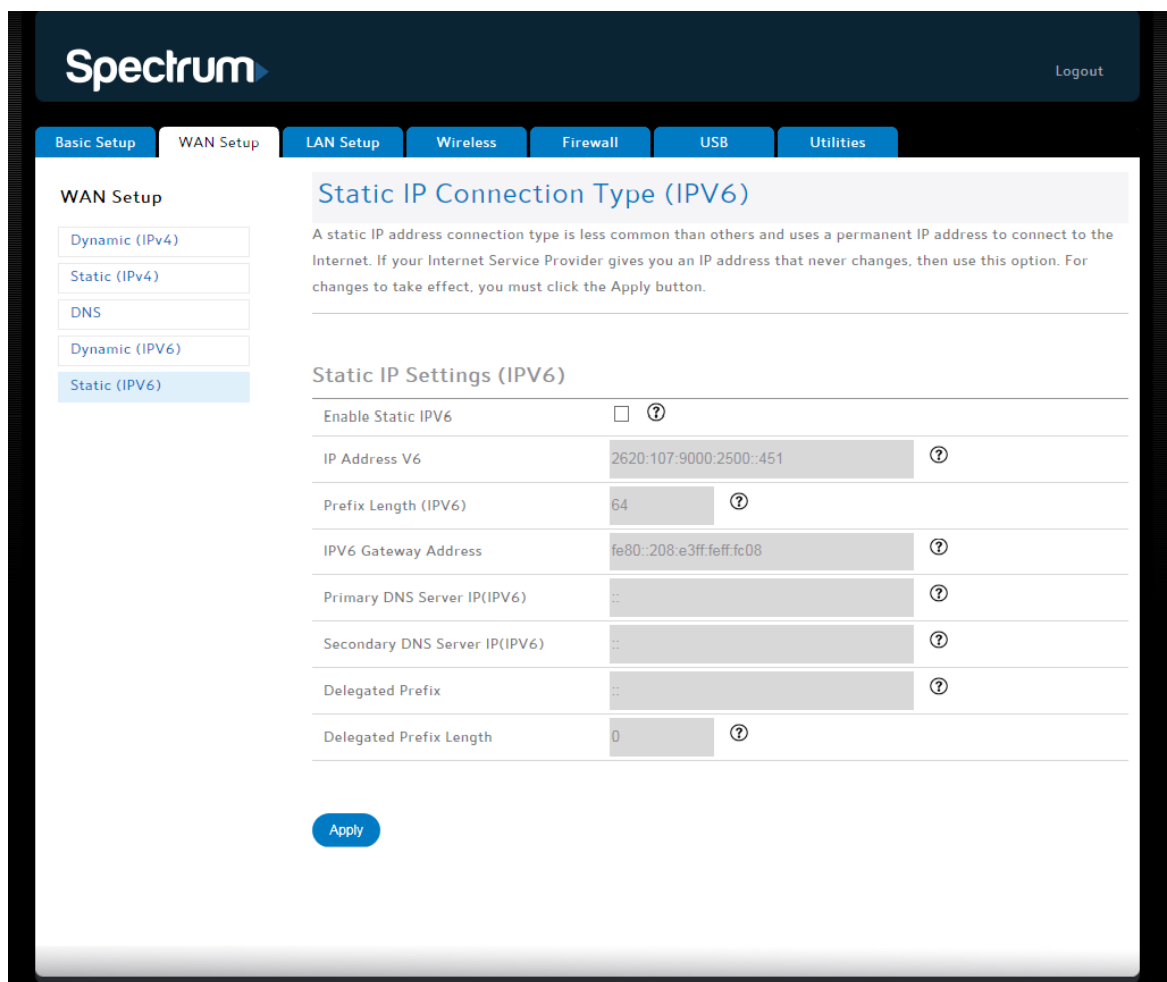
For changes to take effect, you must click Apply.

Dynamic Configuration (IPv6)

Enable DHCP (IPv6)	Clear this checkbox if you want to disable a DHCP (IPv6) connection for the system.
IP Address v6	This field displays the IPv6 address automatically assigned by Spectrum. An IPv6 address has eight groups of four hexadecimal digits (0-9, a-f). The groups are separated by colons, for example, 2001:0db8:85a3:0000:0000:8a2e:0370:7334. A double colon (::) is shorthand for an address of all zeros.

	The prefix length appears at the end of the IPv6 address, following a slash.
Delegated Prefix	This field displays the assigned IPv6 prefix to be used by addresses allocated in the local network.
Delegated Prefix Length	This field displays the assigned IPv6 prefix length.
IPv6 Gateway Address	This field displays the gateway address.

Static IP Connection Type (IPv6)



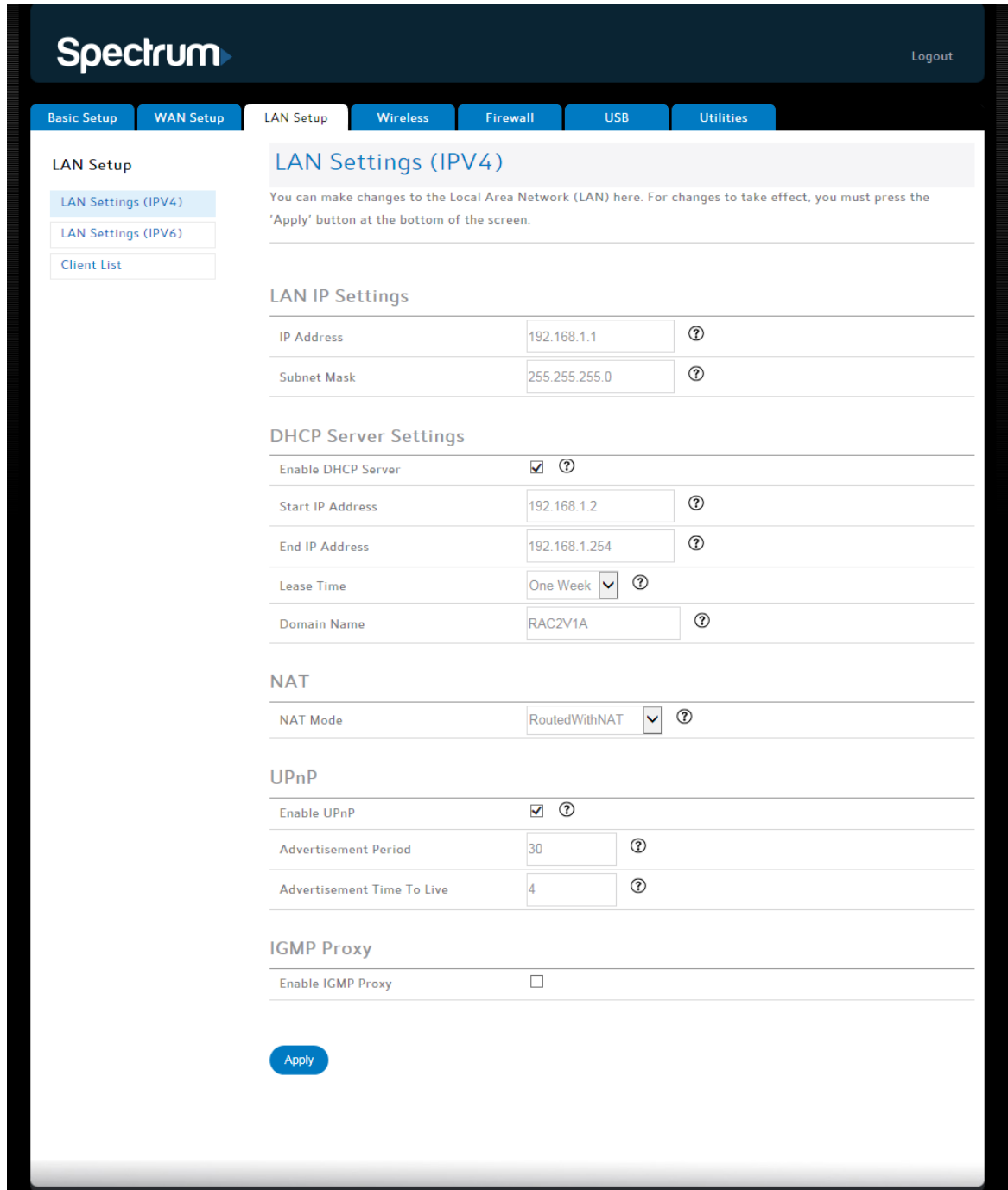
This screen enables a statically configured IPv6 address. A static IP address connection type is less common than others and uses a permanent IPv6 address to connect to the Internet. If Spectrum provides an IP address that never changes, then use this option. For changes to take effect, you must click Apply.

Static IP Settings (IPv6)

Enable Static IPv6	Click this checkbox to enable a static IPv6 address connection for the system.
IP Address v6	Enter the IPv6 address assigned to you by Spectrum or static IP operation. An IPv6 address has eight groups of four hexadecimal digits (0-9, a-f). The groups are separated by colons, for example, 2001:0db8:85a3:0000:0000:8a2e:0370:7334. A double colon (::) is shorthand for an address of all zeros.
Prefix Length (IPv6)	The length of the network portion of this address.
IPv6 Gateway Address	Enter the gateway address assigned for the device by Spectrum for static IP operation.
Primary DNS Server (IPv6)	Enter the IPv6 address of the primary DNS server. Spectrum will provide this information.
Secondary DNS Server (IPv6)	Enter the IPv6 address of the secondary DNS server. Spectrum will provide this information.
Delegated Prefix	The network portion of the IPv6 addresses to be allocated to local clients.
Delegated Prefix Length	The length of the network portion of the IPv6 addresses to be allocated to local clients.

LAN Setup

LAN Settings (IPv4)



You can make changes to the Local Area Network (LAN) configuration here. For changes to take effect, you must click Apply.

LAN IP Settings

IP Address This field displays the IP address of the LAN.

Subnet Mask	This field displays the subnet mask of the LAN.
-------------	---

DHCP Server Settings

Enable DHCP Server	<p>Click this checkbox to enable the use of a Dynamic Host Configuration Protocol (DHCP) Server on the network.</p> <p>DHCP is a set of rules used by devices such as a computer, router, or network adapter to allow the device to request and obtain an IP address from a server which maintains a list of addresses available for use.</p> <p>The DHCP server ensures that all IP addresses are unique, e.g., no IP address is assigned to a second device while the first device's assignment is valid (its lease has not expired).</p> <p>Without DHCP, the IP addresses must be entered manually at each computer in an organization, and a new IP address must be entered each time a computer moves to a new location on the network.</p>
Start IP Address/End IP Address	Enter the range of IP addresses that the DHCP Server will be allowed to assign to a network device.
Lease Time	<p>Select the time before the assigned IP address will expire. (After the lease time is up, the user is automatically assigned a new dynamic IP address.)</p> <p>A "lease" is the amount of time that a given IP address will be valid for a computer or other network device. The lease time can vary depending on how long a user is likely to require the Internet connection at a particular location. Using very short leases, DHCP can dynamically reconfigure networks where there are more computers than available IP addresses, such as educational environments.</p>
Domain Name	Enter the domain name that you want to display on client devices.

NAT

NAT Mode	Select the NAT Mode. <ul style="list-style-type: none">• RoutedwithNAT: Data will be routed by the device and all the outgoing packets will be NATed.• RoutedwithoutNAT: Data will be routed by the device but all the outgoing packets will not be NATed.• Bridged: Data will pass through the device directly without any routing and without NAT.
----------	--

UPnP

Enable UPnP	Click this checkbox to enable UPnP (Universal Plug and Play) on the system.
Advertisement Period	Specify how often (in minutes) the router should advertise its UPnP information. The default is 30 minutes.
Advertisement Time To Live	Enter the maximum number of hops that each UPnP packet can be sent before it is disregarded. The default value is 4, which should be acceptable for most home networks.

IGMP Proxy

Enable IGMP Proxy	Click this checkbox to enable the IGMP (Internet Group Management Protocol) proxy on the system.
-------------------	--

LAN Settings (IPv6)

Spectrum Logout

Basic Setup | WAN Setup | **LAN Setup** | Wireless | Firewall | USB | Utilities

LAN Setup

- LAN Settings (IPv4)
- LAN Settings (IPv6)**
- Client List

LAN Settings (IPv6)

You can make changes to the Local Area Network (LAN) here. For changes to take effect, you must press the 'Apply' button at the bottom of the screen.

LAN Settings (IPv6)

Enable	<input checked="" type="checkbox"/>	
IP Address V6	<input type="text" value="::"/>	?
Prefix Length (IPv6)	<input type="text" value="64"/>	?
Link Local Address (IPv6)	<input type="text" value="fe80::5e8f:e0ff:fe07:34ff"/>	?

DHCP Server Settings (IPv6)

DHCP Ranges Settings (IPv6)	<input type="checkbox"/>	?
Start IP Address (IPv6)	<input "::1"="" type="text" value=""/>	?
End IP Address (IPv6)	<input "::1000"="" type="text" value=""/>	?
Lease Time (IPv6)	<input type="text" value="86400"/>	?

IGMP Proxy

Enable MLD Proxy	<input type="checkbox"/>
------------------	--------------------------

[Apply](#)

This screen configures LAN side support for IPv6. You can make changes to the Local Area Network (LAN) IPv6 configuration here. For changes to take effect, you must click Apply.

Enable

Click the checkbox if you want to configure IPv6 in your LAN. If the box is unchecked, your LAN will only have an IPv4 address.

When you enable IPv6 in the LAN, a different IPv6-based subnet is recognized on the LAN, and the local DHCPv6 server will hand out stateless and stateful addresses based on the prefix information broken down from the WAN side delegated prefix.

LAN Settings (IPv6)

IP Address (IPv6) This field displays the IPv6 address of the LAN. An IPv6 address has eight groups of four hexadecimal digits (0-9, a-f). The groups are separated by colons, for example, 2001:0db8:85a3:0000:0000:8a2e:0370:7334. A double colon (::) is shorthand for an address of all zeros.

Prefix Length v6 Length of the network portion of the IPv6 address.

Link Local Address (IPv6) IPv6 address that can be used only on this LAN interface.

DHCP Server Settings (IPv6)

DHCP Ranges Settings (IPv6) Click the checkbox if you want to enable the LAN DHCPv6 pool range.

Start IP Address (IPv6)/End IP Address (IPv6) Enter the range of IPv6 addresses that the DHCP Server will be allowed to assign to a network device.

Lease Time (IPv6) Select the time before the assigned IP address will expire. (After the lease time is up, the user is automatically assigned a new dynamic IP address.)
A "lease" is the amount of time that a given IP address will be valid for a computer or other network device. The lease time can vary depending on how long a user is likely to require the Internet connection at a particular location. Using very short leases, DHCP can dynamically reconfigure networks where there are more computers than available IP addresses, such as educational environments.

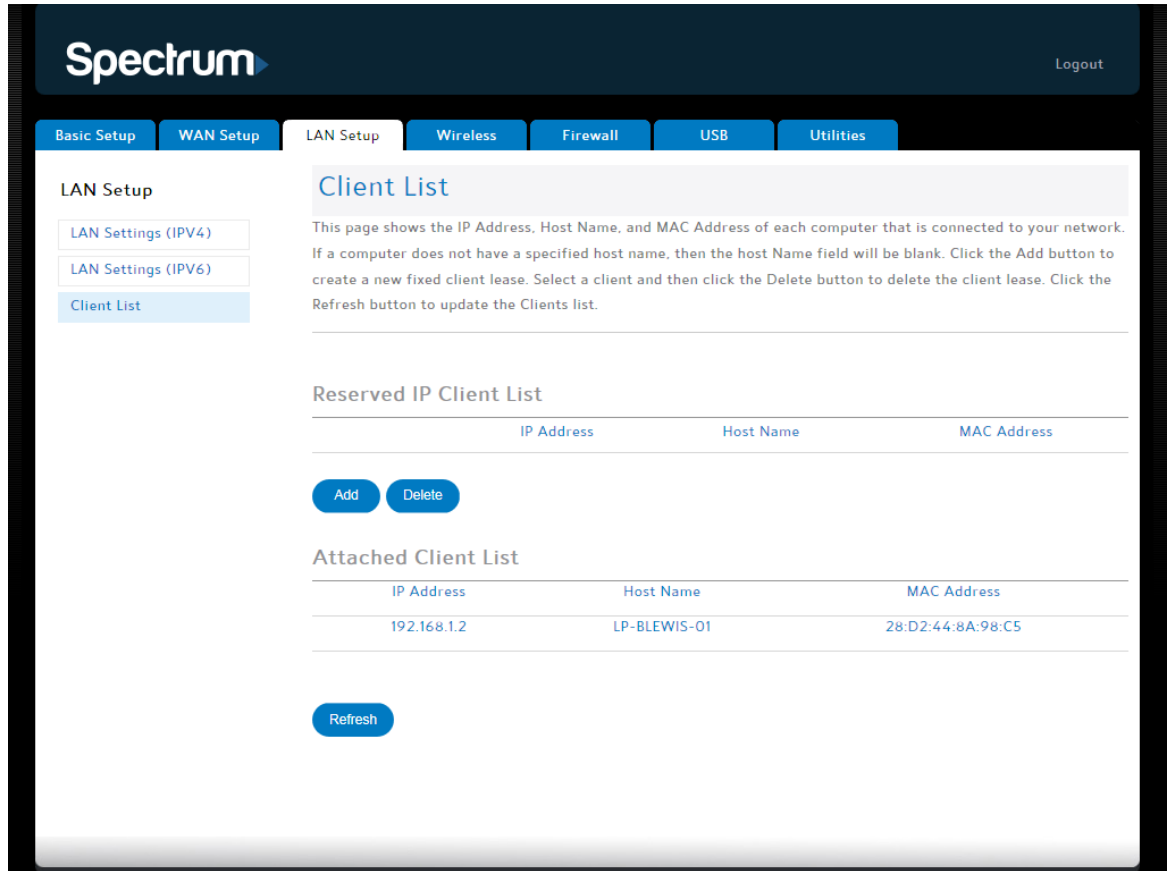
Enable DHCP Relay (IPv6) Click the checkbox to enable DHCP Relay functionality on the system.

IGMP Proxy

Enable MLD Proxy

Multicast Listener Discover (MLD) lets your router discover multicast listeners on an attached link. Click the checkbox to enable MLD proxy functionality on the system.

Client List



This page shows the IP address, host name and MAC address of each computer that is connected to the network. If a computer does not have a specified host name, then the host name field will be blank.

Reserved IP Client List

IP Address Enter the client’s IP address.

Host Name Enter a host name for the client.

MAC Address Enter the client’s MAC address.

Click Add to create a new fixed client lease. Complete the necessary fields in the pop-up window, and then click Apply.

Select a client and then click Delete to delete the reserved client from the list.

Attached Client List

IP Address	The IP address of a connected client.
Host Name	The host name of a connected client.
MAC Address	The MAC address of a connected client.

Click Refresh to update the client list.

Wireless

Basic Setup

Spectrum Logout

Basic Setup | WAN Setup | LAN Setup | **Wireless** | Firewall | USB | Utilities

Wireless

- Basic Setup
- Advanced
- Associated Stats
- Airtime Fairness
- QoS Classification
- Log

Basic Setup

While your system has many configuration options, the options on this Basic Setup page are those required by most users. Click the tabs to access the other configuration pages to set advanced options. Hover the mouse pointer over the question mark icon next to an option to view a description of that option. For changes to take effect, you must click the Apply button.

Wireless 2.4 GHz

SSID	1	?
Enable SSID	<input checked="" type="checkbox"/>	?
Channel	Auto	?
WiFi Network Name (SSID)	MySpectrumWiFi00-2G	?
Wireless Mode	802.11g+n	?
Channel Bandwidth	20MHz	?
Broadcast Network Name (SSID)	<input checked="" type="checkbox"/>	?
AP Isolation	<input type="checkbox"/>	?
Enable WMM	<input checked="" type="checkbox"/>	?
Security Mode	WPA2-PSK	
Password (Network Key)	middlepaper282	?

Wireless 5 GHz

SSID	1	?
Enable SSID	<input checked="" type="checkbox"/>	?
Channel	Auto	?
WiFi Network Name (SSID)	MySpectrumWiFi00-5G	?
Wireless Mode	802.11n & 802.11ac	?
Channel Bandwidth	20/40/80MHz	?
Broadcast Network Name (SSID)	<input checked="" type="checkbox"/>	?
AP Isolation	<input type="checkbox"/>	?
Enable WMM	<input checked="" type="checkbox"/>	?
Security Mode	WPA2-PSK	?
Password (Network Key)	middlepaper282	?

[Apply](#)

While the system has many configuration options, the options on this Basic Setup page are those required by most users. Click the tabs to access the other configuration pages to set advanced options. Hover the mouse pointer over the question mark icon next to an option to view a description of that option. For changes to take effect, you must click Apply.

Wireless 2.4 GHz/Wireless 5 GHz

SSID	Select the network name (SSID) whose settings you want to display or modify.
Enable SSID	Click this checkbox to enable the wireless network on the system.
Channel	<p>Sets a communications channel for the router. The default setting is "Auto", in which the router selects a channel with the least amount of interference to use.</p> <p>For 2.4 GHz, if you manually select a channel, it's best to choose channel 1, 6, or 11, since these channels do not overlap. If another router is operating in the area, choose a channel that is farthest away from the channel that unit uses. For example, if another router is using channel 11, set your router to channel 1.</p> <p>For 5 GHz, choose a channel that is farthest away from the channel used by any other router operating in the area. If you experience interference or poor performance on a particular channel, try a different channel.</p>
Wi-Fi Network Name (SSID)	Enter a user-friendly name to identify the wireless network. This name is also referred to as the Service Set Identifier (SSID). The name can be up to 32 characters long.

Wireless Mode	<p>Select the proper mode to support all of the wireless devices that will connect to the router.</p> <p>2.4 GHz options are:</p> <ul style="list-style-type: none">• 802.11n• 802.11g+n <p>5 GHz options are:</p> <ul style="list-style-type: none">• 802.11n• 802.11n&802.11ac• 802.11ac <p>The theoretical bandwidth for 802.11g is up to 54 Mbps. The theoretical bandwidth for 802.11n is up to 600 Mbps. The theoretical bandwidth for 802.11ac is up to 1.3 Gbps.</p>
Channel Bandwidth	<p>Sets the 802.11n Channel Bandwidth. Options are:</p> <ul style="list-style-type: none">• 20 MHz• 20/40 MHz• 40 MHz• 20/40/80 MHz (5 GHz only) <p>The default bandwidth for 2.4 GHz is 20/40 MHz, and the default bandwidth for 5 GHz is 20/40/80 MHz.</p>
Broadcast Network Name (SSID)	<p>Click this checkbox to allow the router to broadcast the network name (SSID). If you enable this, the Wi-Fi network name (SSID) will be visible to all users in the area, including both authorized and unauthorized users. If you would like others not to see the access point, uncheck the checkbox to hide the Wi-Fi network name (SSID).</p>
AP Isolation	<p>Click this checkbox to enable AP isolation. When enabled each of the wireless clients will be in its own virtual network and will not be able to communicate with one another. This may be useful if you have many guests using the network.</p>
Enable WMM	<p>Click this checkbox to enable Wi-Fi Multimedia (WMM) functionality. Enabling WMM can help</p>

control latency and jitter when transmitting multimedia content over a wireless connection. Disabling WMM will reduce wireless performance in 802.11n mode.

This quality of service mechanism uses four access categories, which in order of priority are: voice, video, best effort and background. This ensures that applications with low tolerance for latency and jitter are treated with higher priority than less-sensitive data applications. WMM sets different wait times for the four categories in order to provide priority network access for applications that are less tolerant of packet delays.

Security Mode	Determines the security setting for the router. The recommended setting and default is WPA2-PSK (Wi-Fi Protected Access 2 - Pre-Shared Key). Other settings include WPA/WPA2-PSK (Wi-Fi Protected Access/ Wi-Fi Protected Access 2 - Pre-Shared Key) (most compatible); WPA2-Enterprise; or WPA/WPA2-Enterprise. 802.11n performance is only available in WPA2.
---------------	---

Password (Network Key)	Enter a password for your network (SSID). Your password is case-sensitive and must be between 8 and 63 characters. You can use any alphanumeric characters (digits 0-9 and letters A-Z, either upper- or lower-case) and printable special characters (such as \$, !, ?, &, #, @ and others).
------------------------	---

Advanced Settings

Spectrum Logout

Basic Setup | WAN Setup | LAN Setup | **Wireless** | Firewall | USB | Utilities

Wireless

- Basic Setup
- Advanced**
- Associated Stats
- Airtime Fairness
- QoS Classification
- Log

Advanced Settings

The Advanced Wireless Settings screen is used to set up the Router's advanced wireless functions. These settings should only be adjusted by an expert administrator as incorrect settings can reduce wireless performance.

Wireless 2.4 GHz

-->

Beacon Interval	<input type="text" value="100"/>	?
DTIM Interval	<input type="text" value="1"/>	?
RTS Threshold	<input type="text" value="2347"/>	?
Guard Interval	Auto <input type="button" value="v"/>	?
Dynamic Channel Selection	<input type="checkbox"/>	?
Wireless Network Management	<input checked="" type="checkbox"/>	?
Radio Resource Management	<input type="checkbox"/>	?
Dynamic Bandwidth Utilization	<input type="checkbox"/>	?

Wireless 5 GHz

-->

Beacon Interval	<input type="text" value="100"/>	?
DTIM Interval	<input type="text" value="1"/>	?
RTS Threshold	<input type="text" value="2347"/>	?
Guard Interval	Auto <input type="button" value="v"/>	?
Dynamic Channel Selection	<input type="checkbox"/>	?
Wireless Network Management	<input checked="" type="checkbox"/>	?
Radio Resource Management	<input type="checkbox"/>	?
Dynamic Bandwidth Utilization	<input type="checkbox"/>	?

Band Steering

Band Steering Enable	<input type="checkbox"/>	?
MatchingSSID	<input type="text"/>	?

The Advanced Settings page is used to set up the router's advanced wireless functions. These settings should only be adjusted by an expert administrator since incorrect settings can reduce wireless performance. For changes to take effect, you must click Apply.

Wireless 2.4 GHz/Wireless 5 GHz

Beacon Interval Sets the time interval between beacon transmissions in milliseconds. The router uses these transmissions to synchronize the wireless network and its client devices. For compliance with most client devices, the Beacon Interval should remain set at the default of 100ms. The allowable setting range is from 20 to 1024ms.

DTIM Interval Sets the DTIM (Delivery Traffic Indication Message) Interval. The DTIM Interval informs the wireless client devices of the next available window for listening to broadcast and multicast messages. When the router sends a DTIM beacon, the client devices hear the beacon and then listen for the messages. For compliance with most client devices, the DTIM Interval should be left at 1 ms. The allowable setting range is from 1 to 255 ms.

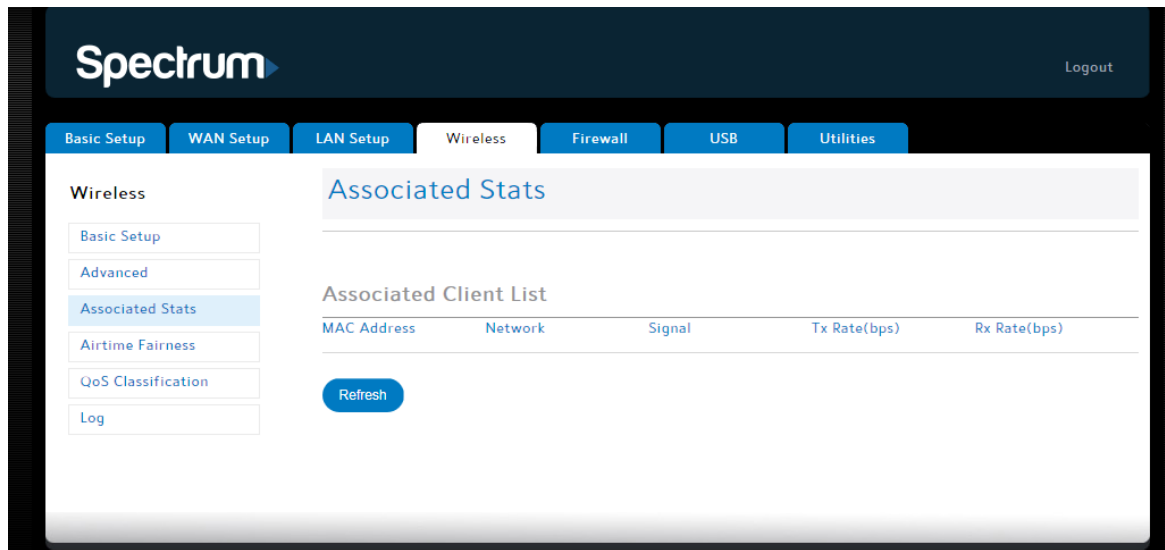
RTS Threshold Sets the packet size limit. When the threshold is passed, the ready to send/clear to send (RTS/CTS) function is invoked. The default setting is 2347 bytes. The allowable setting range is from 1 to 2347 bytes.

Guard Interval The spacing between transmission of symbols. Can be set to short or long. Select short to provide higher throughput in networks where the coverage distance is small (indoors). Select long to provide higher throughput in networks where the coverage distance is large (outdoors).

Dynamic Channel Selection Click the checkbox if you want this radio to periodically monitor the frequency band for channels that have less traffic than the one in use. If a less congested channel is available, Dynamic Channel Selection allows the radio to make an unsolicited channel change.

Wireless Network Management	Click the checkbox if you want to allow clients to exchange information about network topology. Wireless Network Management also supports network-assisted power saving and network-assisted roaming.
Radio Resource Management	Click the checkbox if you want Spectrum to manage the radio channel and transmit power used on this specific radio. Radio Resource Management lets Spectrum use its knowledge of surrounding networks to select the optimal channel and transmit power to avoid interference with other access points inside and outside your premises.
Dynamic Bandwidth Utilization	Click the checkbox if you want this specific radio to dynamically adjust the channel bandwidth for this radio to maximize throughput at any given time. Dynamic Bandwidth Utilization makes bandwidth adjustments based on periodic monitoring of the frequency band to expand the channel width when adjacent frequencies are quiet and shrink the channel width when the frequencies being used have interference.
<hr/> <u>Band Steering</u> <hr/>	
Band Steering Enable	This setting enables the router to steer clients from the 2.4 GHz band to the 5 GHz band as required. Click the checkbox if you would like to enable band steering. Important: In order to use this function, you must go to the Wireless: Basic screen and configure the 2.4 GHz band and the 5 GHz band with the same Wi-Fi Network Name (SSID), Security Mode, and Password (Network Key). See <i>Basic Setup</i> (page 46) for more information.
Matching SSID	Enter the network name (SSID) that you set up for the 2.4 GHz band/5 GHz band pair on the Wireless: Basic screen. See <i>Basic Setup</i> (page 46) for more information.

Associated Stats



This screen provides physical statistics for each associated client.

Associated Client List

MAC Address	The MAC address of an associated client for which statistics are being reported.
Network	The Network name (SSID) where the client is connected.
Signal	The average Received Signal Strength Indicator (RSSI) level of the connected client.
TX Rate (bps)	The transmission rate that is being reported by the associated client.
RX Rate (bps)	The receive rate that is being reported by the associated client.

Airtime Fairness

The screenshot shows the 'Airtime Fairness' configuration page. On the left, a sidebar menu includes 'Basic Setup', 'Advanced', 'Associated Stats', 'Airtime Fairness' (highlighted), 'QoS Classification', and 'Log'. The main content area has a title 'Airtime Fairness' and an 'ATF Enable' checkbox. Below this are three tables for bandwidth allocation:

- Wireless 2.4GHz SSID Percentage:** A table with 4 rows and 2 columns. Each row lists an SSID (e.g., MySpectrumWiFi00-2G) and a percentage field set to 0%.
- Wireless 2.4GHz Client Percentage:** A table with 8 rows and 2 columns. Each row lists a MAC address (MAC1 to MAC8) and a percentage field set to 0%.
- Wireless 5GHz SSID Percentage:** A table with 2 rows and 2 columns. Each row lists an SSID (e.g., MySpectrumWiFi00-5G) and a percentage field set to 0%.

This screen lets you allocate wireless bandwidth to devices based on air time instead of number of frames. By doing so, you can increase the download speeds for newer, faster devices, even when slower devices are connected to the same wireless network.

ATF Enable Click the checkbox to enable Airtime Fairness.

Wireless 2.4 GHz SSID Percentage Use these fields to specify what percentage of the 2.4 GHz band you wish to allocate to each wireless network, based on network name (SSID).

Wireless 2.4 GHz Client Percentage	Use these fields to specify what percentage of the 2.4 GHz band you wish to allocate to each device, based on MAC address. You can enter up to 16 MAC addresses.
Wireless 5 GHz SSID Percentage	Use these fields to specify what percentage of the 5 GHz band you wish to allocate to each wireless network, based on network name (SSID).
Wireless 5 GHz Client Percentage	Use these fields to specify what percentage of the 5 GHz band you wish to allocate to each device, based on MAC address. You can enter up to 16 MAC addresses.

QoS Classification

Spectrum
Logout

Basic Setup
WAN Setup
LAN Setup
Wireless
Firewall
USB
Utilities

Wireless

- Basic Setup
- Advanced
- Associated Stats
- Airtime Fairness
- QoS Classification
- Log

QoS Classification

QoS Classification

Wireless 2.4 GHz

SSID 1 ▾ ?

Enable Classification ?

Classification method SSID Priority ▾ ?

SSID Priority 0 ▾ ?

DSCP Remarking Table

DSCP	Binary	Decimal	Wireless Tos
BE(Default)	000000	0	0 ▾
CS1	001000	8	1 ▾
AF11	001010	10	1 ▾
AF12	001100	12	1 ▾
AF13	001110	14	1 ▾
CS2	010000	16	2 ▾
AF21	010010	18	2 ▾
AF22	010100	20	2 ▾
AF23	010110	22	2 ▾
CS3	011000	24	3 ▾
AF31	011010	26	3 ▾
AF32	011100	28	3 ▾
AF33	011110	30	3 ▾
CS4	100000	32	4 ▾
AF41	100010	34	4 ▾
AF42	100100	36	4 ▾
AF43	100110	38	4 ▾
CS5	101000	40	5 ▾
EF	101110	46	5 ▾
CS6	110000	48	6 ▾
CS7	111000	56	7 ▾

Wireless 5 GHz

SSID 1 ▾ ?

Enable Classification ?

This screen shows the mapping of network name (SSID) priorities and Differentiated Services Code Point (DSCP) remarking. DSCP specifies the priority for queueing IP packets before they are forwarded.

For example, you could set the Home as a Hotspot (HaaH) SSID as a lower priority than the primary SSID to make sure that the owner of the service always gets priority treatment.

If you select SSID Priority as the classification method, all of the L3 DSCP/ToS values for the transmission packets (LAN/WAN to WLAN) will be remarked to the same 802.11e QoS control field value.

If you select DSCP Remarking as the classification method, the L3 DSCP/ToS value of the transmission packets (LAN/WAN to WLAN) will be remarked to 802.11e QoS control field values following the DSCP remarking table below.

Wireless 2.4 GHz/Wireless 5 GHz

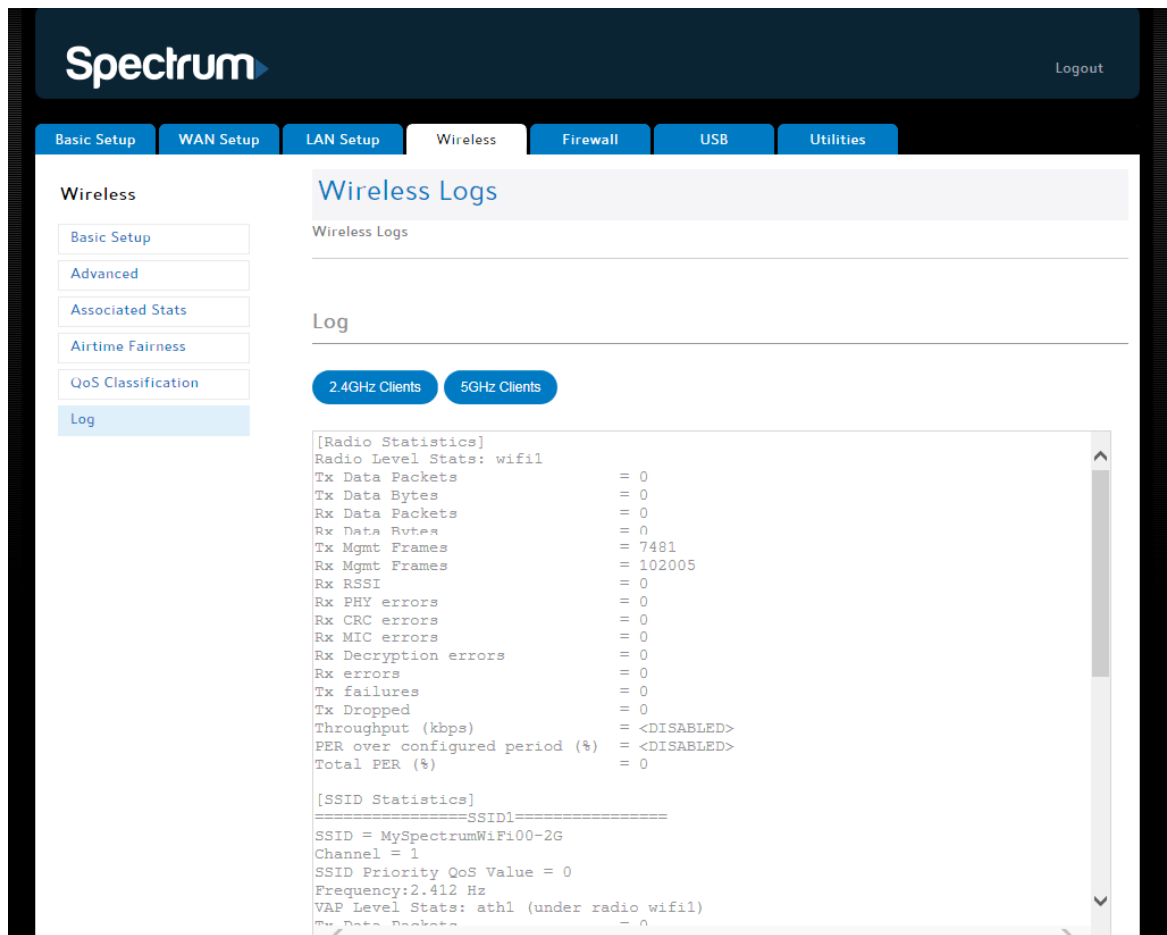
SSID	Choose the network name (SSID) settings that you want to display or modify.
Enable Classification	Click the checkbox if you want to enable this classification on your system.
Classification Method	Choose a classification method for your router. Options are SSID Priority or DSCP Remarking.
SSID Priority	If you choose SSID Priority as the classification method, choose the priority to assign to each packet. Options are: <ul style="list-style-type: none">• 0 maps to Layer 2 CoS value 2 and 802.11e WMM Access Category BK. This is the lowest priority.• 1 maps to Layer 2 CoS value 0 and 802.11e WMM Access Category BE.• 2 maps to Layer 2 CoS value 4 and 802.11e WMM Access Category VI.• 3 maps to Layer 2 CoS value 6 and 802.11e WMM Access Category VO. This is the highest priority.

DSCP Remarking Table

This section defines the mapping relationship between L3 DSCP value, L2 ToS value, and 802.11e QoS control field value. We recommend that you do *not* change the default values displayed on the screen.

DSCP	The DSCP value for this entry.
Binary	The binary value for this DSCP entry.
Decimal	The decimal value for this DSCP entry.
Wireless Tos	The wireless type of service. Larger values indicate a higher priority.

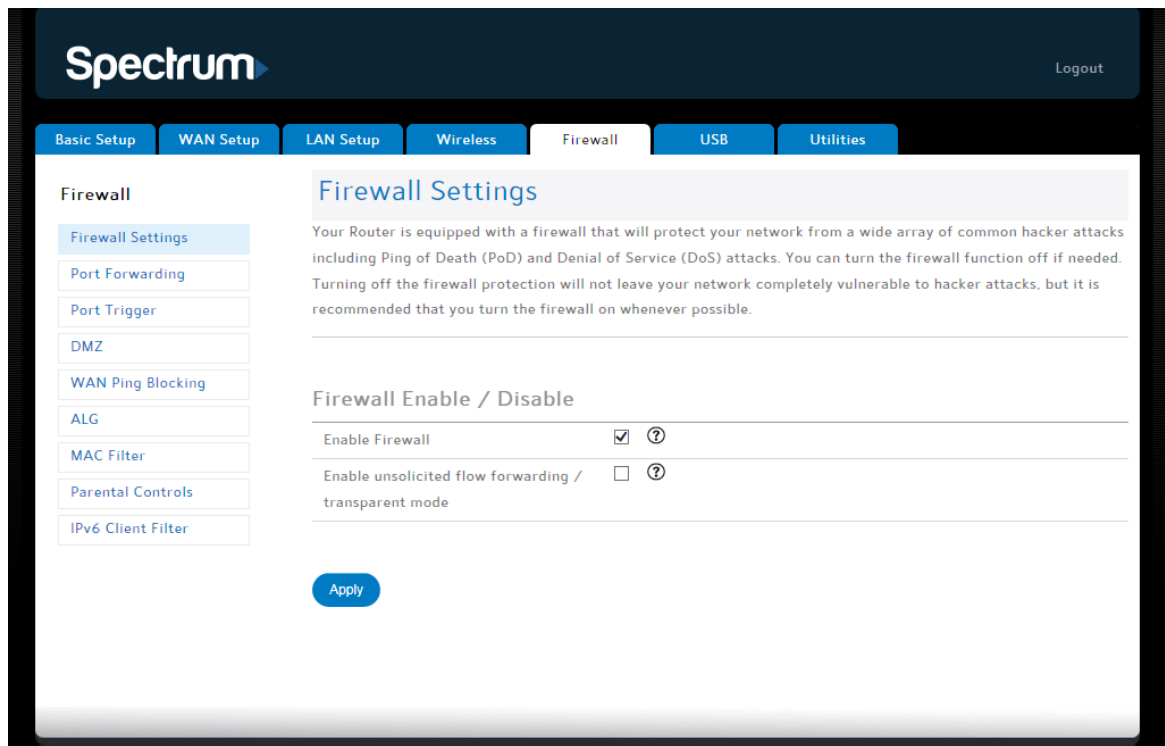
Log



This screen shows a log of communication statistics for your wireless connections. This information may be helpful in troubleshooting issues with your wireless network.

Firewall

Firewall Settings

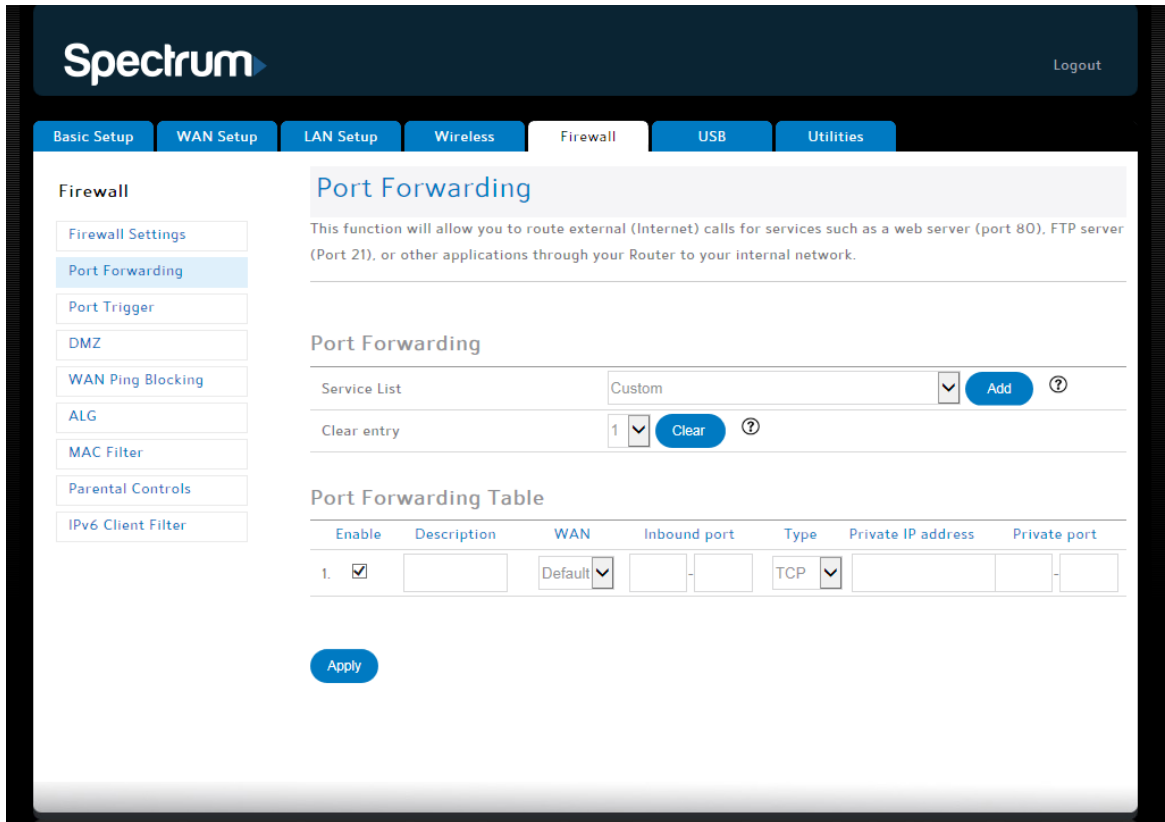


The router is equipped with a firewall that will protect the network from a wide array of common hacker attacks, including Ping of Death (PoD) and Denial of Service (DoS) attacks. You can disable the firewall function if necessary. Turning off the firewall protection will not leave the network completely vulnerable to hacker attacks, but it is recommended that you enable the firewall whenever possible. For changes to take effect, you must click Apply.

Firewall Enable/Disable

Enable Firewall	Click the checkbox to enable the firewall on the system.
Enable unsolicited flow forwarding/transparent mode	Click the checkbox if you want to suspend simple security capabilities associated with the firewall. Doing so allows for more flexibility and reliability for applications that require clients to be contacted inside the home while minimizing the impact on security.

Port Forwarding



The port forwarding function forwards inbound traffic from the Internet to a specified single device on the network. Examples include allowing access to a web server on the network, peer-to-peer file sharing, some gaming and videoconferencing applications and others. This function allows you to route external (Internet) calls for services such as a web server (port 80), FTP server (Port 21), or other applications through the router to the internal network.

Port Forwarding

Service List Select the kind of service you would like to set up, and click Add. The pre-defined port forwarding rules will be displayed in the table. You must edit the private IP address on the LAN where you want external calls to go, or you can choose Custom and define your own port forwarding rules. When you are finished, click Apply.

Clear Entry To remove the rule from a table and stop forwarding that port, select the entry that you want to clear and click Clear.

Port Forwarding Table

Enable	Clear this checkbox if you want to stop forwarding this port but do <i>not</i> want to remove it from the table.
Description	Enter a name for the port you want to forward.
WAN	Choose whether the port forward should be directed to a client on the default LAN (192.168.1.x) or on a Routing Information Protocol (RIP) gateway.
Inbound Port	Enter the inbound port range for the port you want to forward. It should be the same range as the local port.
Type	Set the format for the port. Options are TCP, UDP, or BOTH.
Private IP Address	Enter the IP address of the machine on the LAN where you want the connections to go.
Private Port	Enter the private port range for port you want to forward. It should be the same range as the inbound port.

Port Triggers

The screenshot shows the Spectrum router's configuration interface. At the top, there's a navigation bar with the Spectrum logo and a 'Logout' link. Below that, a series of tabs represent different configuration sections: Basic Setup, WAN Setup, LAN Setup, Wireless, Firewall (selected), USB, and Utilities. On the left side, under the 'Firewall' section, there's a list of sub-sections: Firewall Settings, Port Forwarding, Port Trigger (highlighted), DMZ, WAN Ping Blocking, ALG, MAC Filter, Parental Controls, and IPv6 Client Filter. The main content area is titled 'Port Triggers' and contains a descriptive paragraph: 'This page displays a list of enabled port triggers. Port Triggering allows you to anticipate and pre-configure access to specific hosts on your local network by external services. This is done by opening an incoming port for incoming traffic by a known external service.' Below this text is a table with the following data:

	Description	Outbound Port	Type	Inbound Port
<input checked="" type="radio"/>	GQA Service	100-130	TCP	10-50

At the bottom of the table, there are three buttons: 'Edit', 'Add', and 'Delete'.

Port triggers let you configure dynamic triggers to specific devices on the LAN. This allows special applications that require specific port numbers with bi-directional traffic to function properly. Applications such as video conferencing, voice, gaming and some messaging program features may require these special settings.

To add a new port trigger, click Add. Complete the necessary fields in the pop-up window, and then click Apply.

To edit a port trigger, select the entry and then click Edit.

To delete a port trigger, select the entry and then click Delete.

Description	Enter a description for the trigger you want to set up.
Outbound Port	Specify the range of outbound port numbers.
Type	Specify the type of port. Options are TCP, UDP, and BOTH.
Inbound Port	Specify the range of inbound port numbers.

DMZ

The screenshot shows the Spectrum router's configuration interface. At the top, the 'Spectrum' logo is on the left and 'Logout' is on the right. Below the logo is a navigation bar with tabs for 'Basic Setup', 'WAN Setup', 'LAN Setup', 'Wireless', 'Firewall', 'USB', and 'Utilities'. The 'Firewall' tab is active. On the left side, there is a sidebar menu with options: 'Firewall Settings', 'Port Forwarding', 'Port Trigger', 'DMZ', 'WAN Ping Blocking', 'ALG', 'MAC Filter', 'Parental Controls', and 'IPv6 Client Filter'. The 'DMZ' option is selected and highlighted. The main content area is titled 'DMZ' and contains the following text: 'The DMZ feature allows you to specify one computer on your network to be placed outside of the NAT firewall. This may be necessary if the NAT feature is causing problems with an application such as a game or video conferencing application. Use this feature on a temporary basis. The computer in the DMZ is not protected from hacker attacks. To put a computer in the DMZ, enter the last digits of its IP address in the field below and select "Enable". The user is advised to create an IP reservation for the client to be placed in the DMZ using the Reserved IP Client List (see LAN Setup – Client List page). Click "Apply Changes" for the change to take effect.'

Below the text are two sections for settings:

- DMZ IPv4 Settings:** This section has three columns: 'Enable', 'Static IP', and 'Private IP'. The 'Enable' column has a checked checkbox. The 'Static IP' column contains the value '10.2.75.67'. The 'Private IP' column contains the value '192.168.1.' followed by an empty input box.
- DMZ IPv6 Settings:** This section has two columns: 'Enable' and 'IPv6 DMZ Host IP'. The 'Enable' column has a checked checkbox. The 'IPv6 DMZ Host IP' column contains an empty input box.

At the bottom of the settings area, there is a blue 'Apply' button.

The DMZ feature allows you to specify one computer on the network to be placed outside of the NAT firewall. This may be necessary if the NAT feature is causing problems with an application such as a game or video conferencing application.

Use this feature only on a temporary basis. The computer in the DMZ is not protected from hacker attacks.

To put a computer in the DMZ, click the Enable checkbox, enter its IP address, and click Apply.

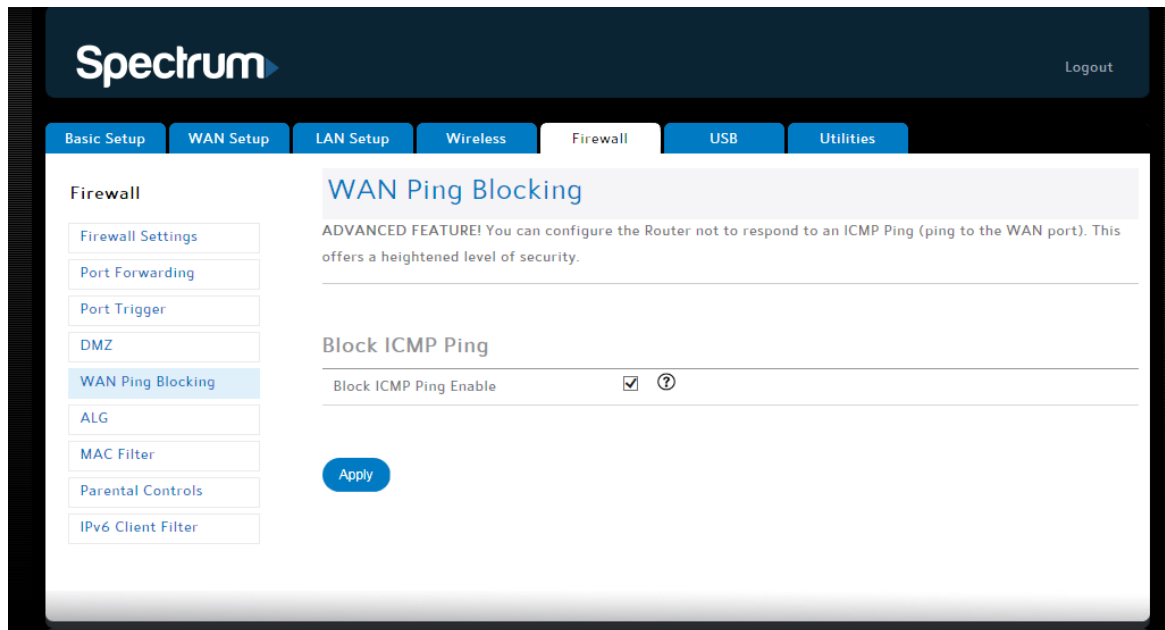
DMZ IPv4 Settings

Enable	Clear this checkbox if you want to remove the computer from the DMZ and disable the DMZ on the network.
Static IP	Displays router's WAN IP address. This is the address that external devices will use to contact the computer in the DMZ.
Private IP	Enter the IPv4 address of the computer to be placed in the DMZ. Be sure that the address is not in the range of addresses delivered by the DHCP server if enabled. Once you place the computer in the DMZ, all ports on the computer are open to the Internet and not protected.

DMZ IPv6 Settings

Enable	Clear this checkbox if you want to remove the computer from the DMZ and disable the DMZ on the network.
IPv6 DMZ Host IP	Enter the IPv6 address of the computer to be placed in the DMZ. Be sure that the address is not in the range of addresses delivered by the DHCP server if enabled. Once you place the computer in the DMZ, all ports on the computer are open to the Internet and not protected.

WAN Ping Blocking

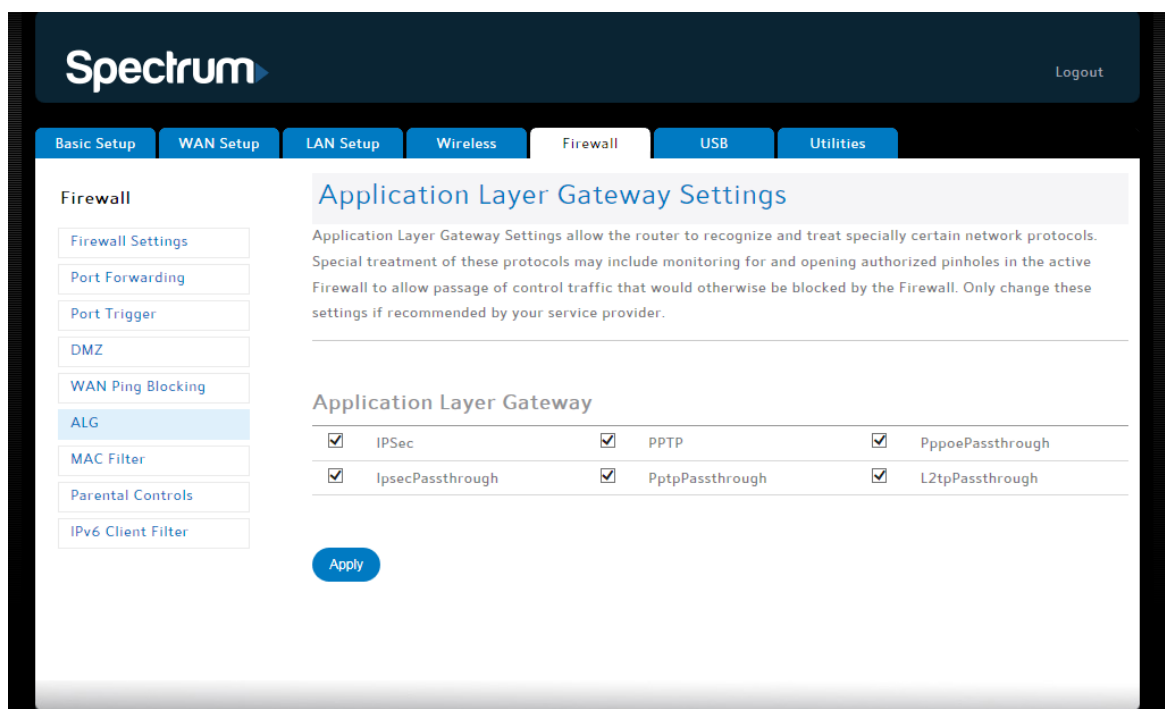


You can configure the router not to respond to an ICMP Ping (ping to the WAN port). This offers a heightened level of security.

Block ICMP Ping

Block ICMP Ping Enable Click this checkbox to enable WAN Ping Blocking.

Application Layer Gateway Settings



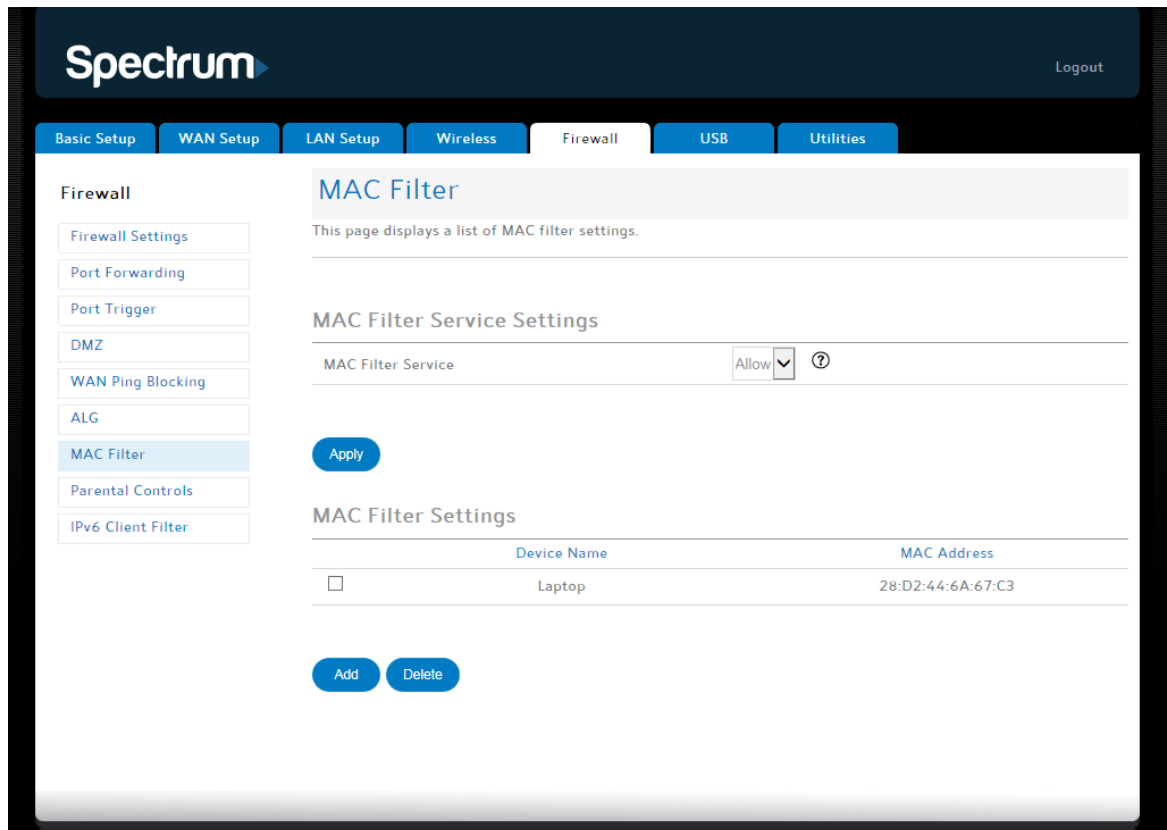
Application layer gateway settings allow the router to recognize and treat certain network protocols specially.

Important: You should not change these settings unless recommended by your service provider. Most users will never need to change the settings on this page.

Application Layer Gateway

Click the checkbox for each network protocol for which you want special handling. Options are IPsec, PPTP, PppoePassthrough, IpsecPassthrough, PptpPassthrough, and L2tpPassthrough.

MAC Filter



MAC address filtering gives you an extra layer of security by allowing you to specify which devices can access your network. Whenever a new device tries to join your network, the router checks the MAC address of the device against a list of approved addresses. You can choose to allow (whitelist) or deny (blacklist) MAC addresses. Whenever a device tries to access your network, the router checks the MAC filter settings to determine whether the device should be allowed to access your network.

MAC Filter Service	Choose either Deny to prevent the specified MAC addresses from reaching the Internet or Allow to allow the specified MAC addresses to reach the Internet. Then click Apply.
--------------------	---

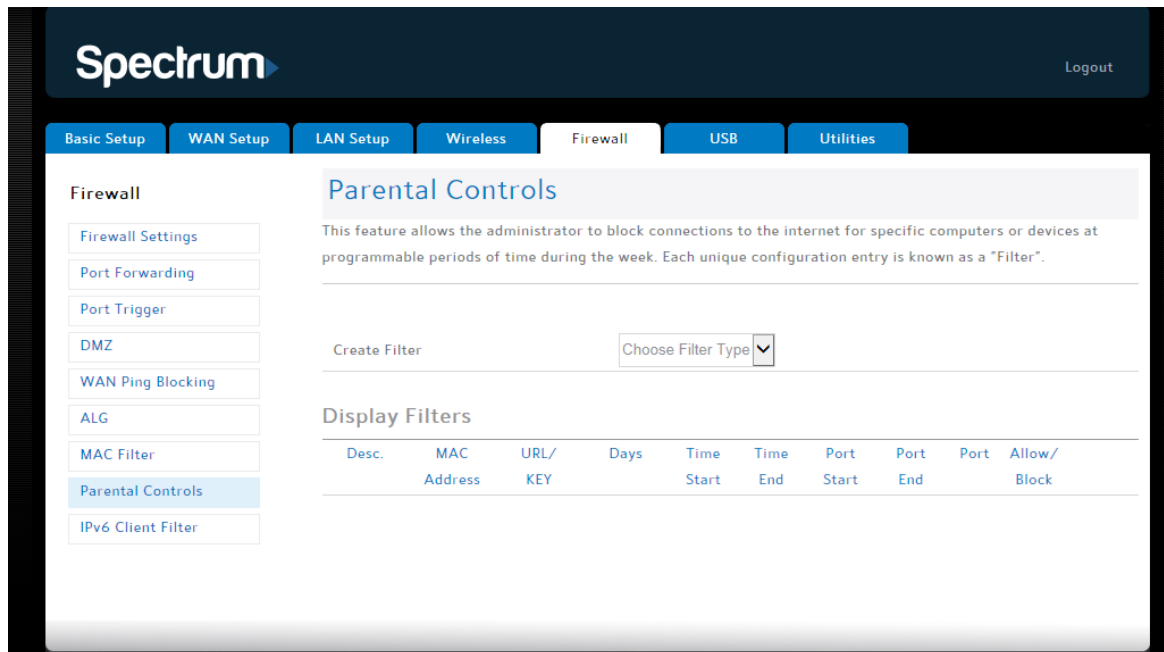
MAC Filter Settings

Device Name	Enter a name for the device that you want to specify. This should be a name that you will recognize (for example, "Home Router" or "Jane's Office").
MAC Address	Enter the MAC address for the device that you want to specify. You can also select the MAC address from a list of online clients.

Click Add to create a new MAC filter setting. Complete the necessary fields in the pop-up window, and then click Apply.

To delete a MAC filter setting, select the entry and then click Delete.

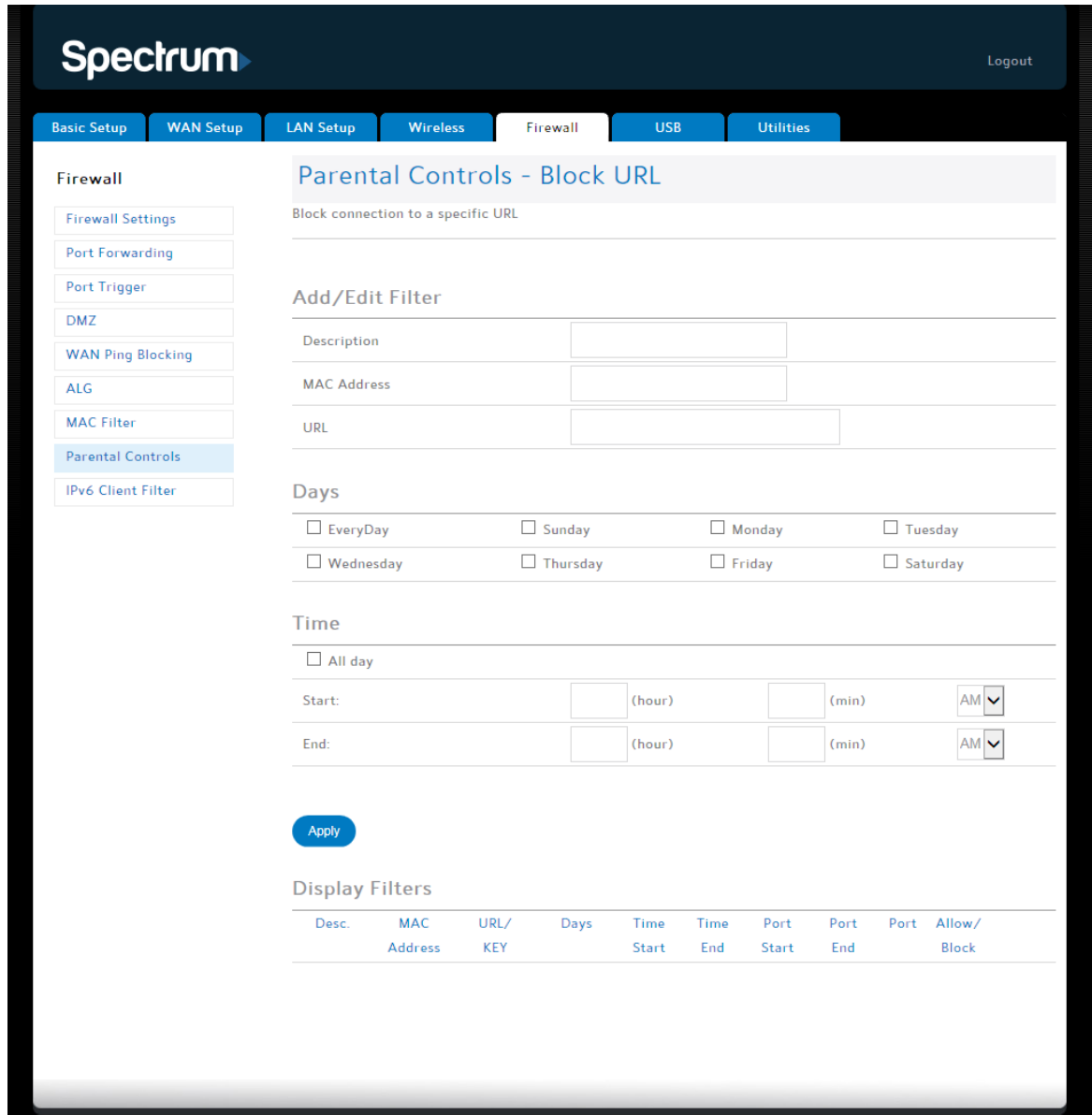
Parental Controls



Parental Control lets you block access to the Internet (or certain sites on the Internet) at various times that you specify. You can block sites based on keywords, URL, or custom filters that you set up.

Create Filter Choose whether you want to create a filter based on keywords, URL, or custom parameters that you define.

Parental Controls - Block URL

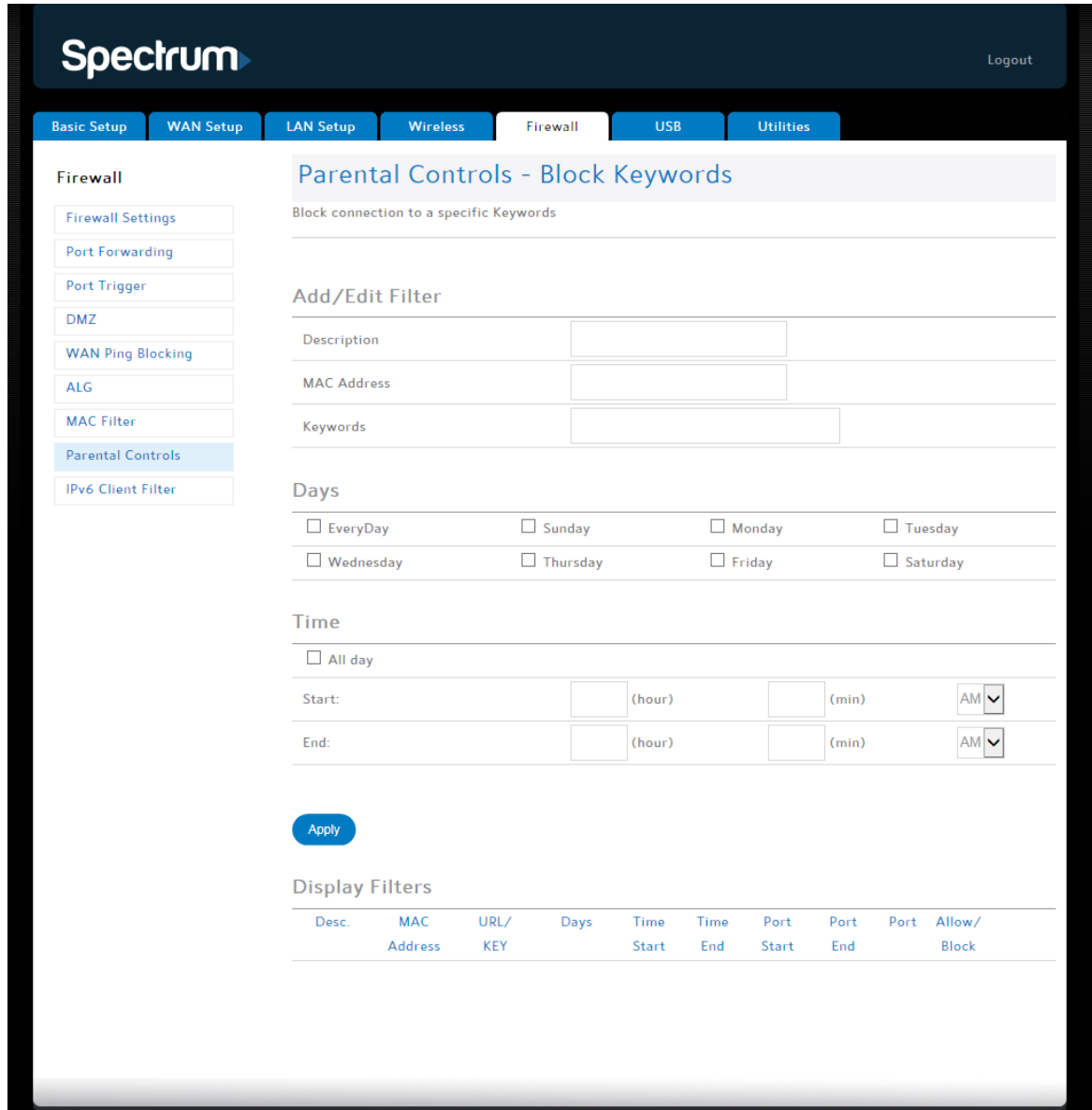


Use this screen to block access to websites based on their URLs (web addresses). The IP address resolved by the fully qualified domain name (FQDN) will also be blocked.

Description Type a description for the filter you are creating.

MAC Address	<p>Type the MAC address of the device that you want to restrict from accessing the URLs that you specify. If you want the filter to apply to multiple clients, you must enter the MAC addresses one by one.</p> <p>If you do not specify a MAC address, the filter will apply to all clients.</p>
URL	<p>Type the URL of the site that you want to block as part of this filter. If you would like to block multiple sites, you will enter them one at a time and click Apply after each URL that you want to block.</p>
Days	<p>Select the days that you would like for this filter to be in effect.</p>
Time	<p>Select the time of day that you would like for this filter to be in effect.</p>
Display Filters	<p>This area displays any filters that you have already defined and lets you modify or delete those filters.</p> <p>If you want to edit an existing filter, click Edit.</p> <p>If you want to delete an existing filter, select the filter and click Delete.</p> <p>If you want to remove all of your filters, click Remove All.</p>

Parental Controls - Block Keywords



Use this screen to block access to websites based on keywords that appear in the website’s HTTP header or DNS query.

Description Type a description for the filter you are creating.

MAC Address Type the MAC address of the device that you want to restrict from accessing sites that contain these keywords. If you want the filter to apply to multiple clients, you must enter the MAC addresses one by one.

If you do not specify a MAC address, the filter will apply to all clients.

Router Configuration Screen Descriptions

Keywords	Type the keywords that you want to block as part of this filter. If you want to block multiple keywords, you will enter them one at a time and click Apply after each keyword that you want to block.
Days	Select the days that you would like for this filter to be in effect.
Time	Select the time of day that you would like for this filter to be in effect.
Display Filters	This area displays any filters that you have already defined and lets you modify or delete those filters. If you want to edit an existing filter, click Edit. If you want to delete an existing filter, select the filter and click Delete. If you want to remove all of your filters, click Remove All.

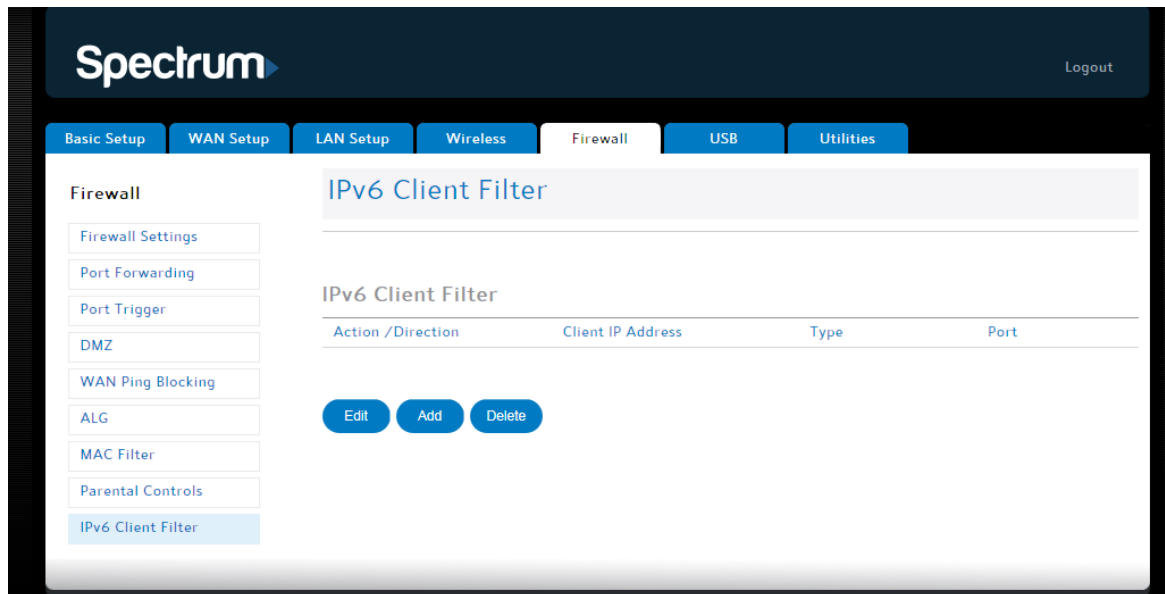
Parental Controls - Custom

Use this screen to block access to websites based on custom filters that you define.

Description Use this field to type a description for the filter you are creating.

MAC Address	Type the MAC address of the device that you want to restrict from accessing the URLs that you specify. If you want the rule to apply to multiple clients, you must enter the MAC addresses one by one. If you do not specify a MAC address, the rule will apply to all clients.
URL	Type the URL of the site that you want to block as part of this filter. If you would like to block multiple URLs, you will enter them one at a time and click Apply after each URL that you want to block.
Start Port	Type the starting number for the range of ports that you want to block.
End Port	Type the ending number for the range of ports that you want to block.
Protocol	Select the protocol that you want to block.
Days	Select the days that you would like for this filter to be in effect.
Time	Select the time of day that you would like for this filter to be in effect.
Allow/Block	Use the drop-down menu to specify whether you want this filter to allow or block access under the conditions you specify.
Display Filters	This area displays any filters that you have already defined and lets you modify or delete those filters. If you want to edit an existing filter, click Edit. If you want to delete an existing filter, select the filter and click Delete. If you want to remove all of your filters, click Remove All.

IPv6 Client Filter



This screen lets you whether incoming ports to LAN IPv6 clients should be able to bypass the default IPv6 firewall on the router. You can also choose to block outgoing ports on LAN IPv6 clients.

Click Add to create a new IPv6 client filter. Complete the necessary fields in the pop-up window, and then click Apply.

Select a filter and then click Edit to edit the filter.

Select a filter and then click Delete to delete the filter from the list.

IPv6 Client Filter

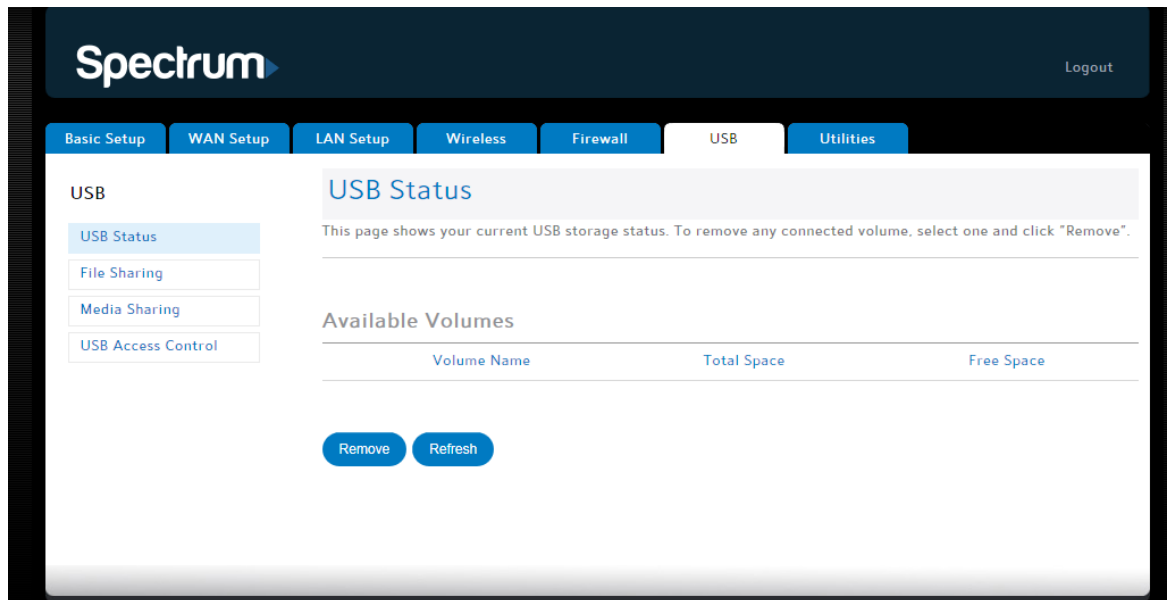
Action/Direction	Select whether the client device should be allowed to bypass the IPv6 firewall (Allow+Incoming) or blocked from accessing the Internet (Deny+Outgoing).
------------------	---

Client IP Address	Enter the client IPv6 address for which this rule applies. You can enter a single address or a range of addresses.
-------------------	--

Type	The traffic type for which this rule applies. Options are: <ul style="list-style-type: none"> • TCP • UDP • Both (TCP and UDP) • ICMPv6
Port	Enter the port or range of ports to which this entry applies.

USB

USB Status



The USB status shows any USB devices that are connected to the router. Click Refresh to update the list.

If you want to disconnect a device, select the device and click Remove. Then unplug the device.

Available Volumes

Volume Name	The volume name of a connected USB device.
Total Space	The total space available on the associated USB device.
Free Space	The amount of free space available on the associated USB device.

File Sharing

Spectrum Logout

Basic Setup | WAN Setup | LAN Setup | Wireless | Firewall | **USB** | Utilities

USB

- USB Status
- File Sharing**
- Media Sharing
- USB Access Control

File Sharing

This page shows all the network folders that currently can be accessed and configured on this device. This page also allows the device access from a remote FTP client on the Internet.

FTP Server Settings

Enable FTP Server ?

FTP Server Access ?

Share Folder Settings

Enable Share Folders ?

Share Folders Access ?

HTTPS Server Settings

Enable HTTPS Server

HTTPS Server Access

NFS Settings

Enable NFS

AFP Settings

Enable AFP

Share Folders Access

Apply

Available Share Folders

Share Name	Admin Access	Everyone Access	Folder Name
<p>Edit Add Delete</p>			

File sharing lets you configure folders on the USB device so that you can share files with other devices. An FTP server makes the folder available for remote users over the Internet. Shared folders are available to users on your local network.

FTP Server Settings

Enable FTP Server	Click this box to enable an FTP server on your USB device.
-------------------	--

FTP Server Access	Use this field to specify the folder that you want to make available as an FTP server.
-------------------	--

Share Folder Settings

Enable Share Folders	Click this box to enable shared folders on your USB device.
----------------------	---

Share Folders Access	Use this field to specify the folder that you want to make available as a shared folder.
----------------------	--

HTTPS Server Settings

Enable HTTPS Server	Click this box to enable an HTTPS server on your USB device.
---------------------	--

HTTPS Server Access	Use this field to specify the folder that you want to make available as an HTTPS server.
---------------------	--

NFS Settings

Enable NFS	Click this box to enable NFS on your USB device.
------------	--

AFP Settings

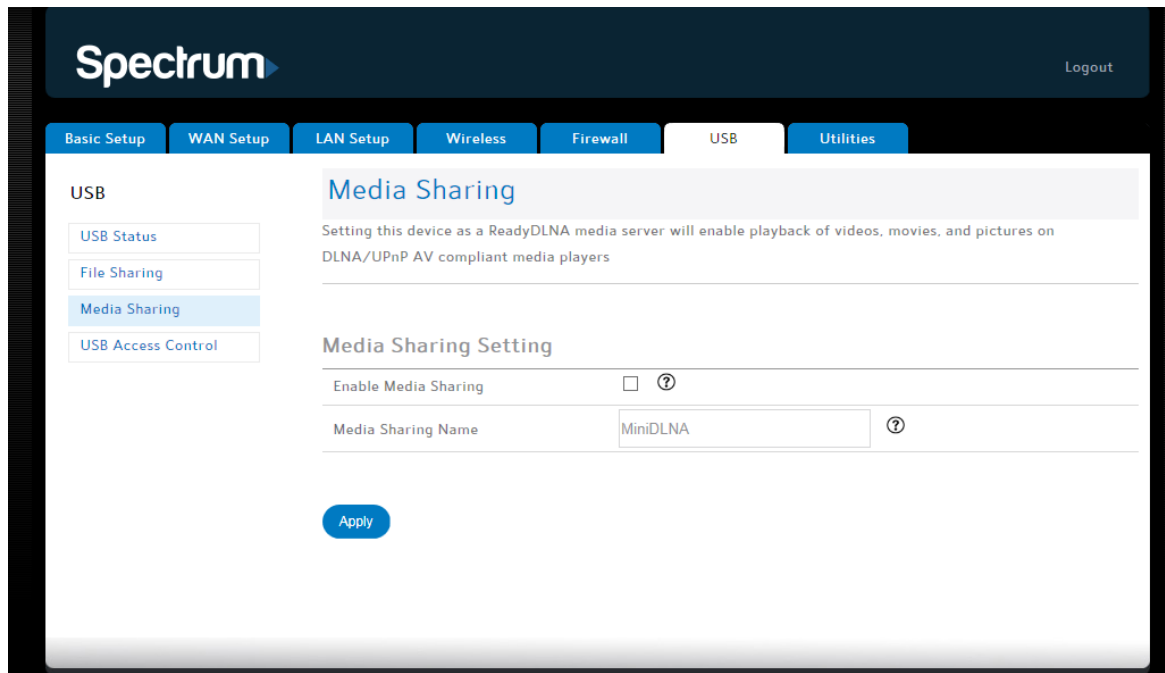
Enable AFP	Click this box to enable AFP on your USB device.
------------	--

Share Folders Access	Use this field to specify the folder that you want to make available for AFP.
----------------------	---

Available Share Folders:

Use this section to add, edit, or delete shared folders on the USB device.

Media Sharing

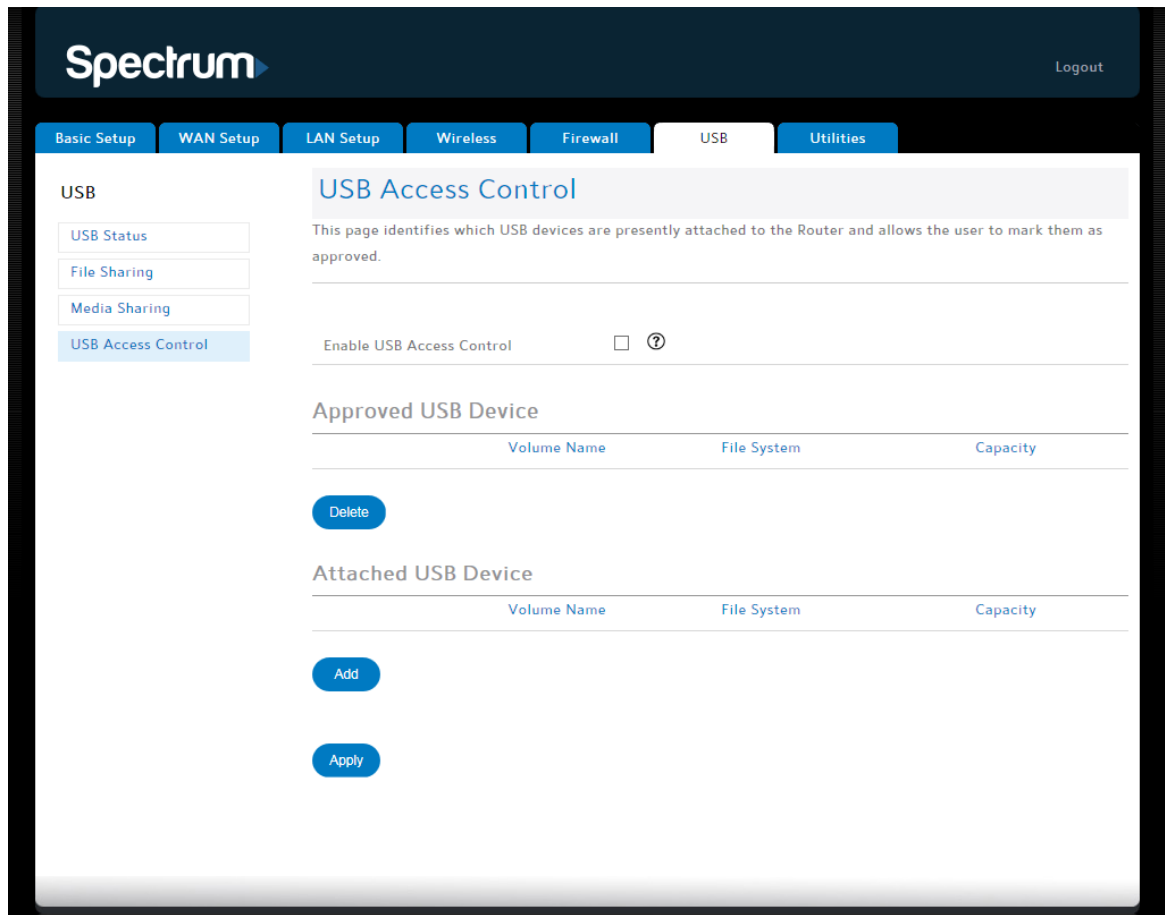


Media sharing lets you configure network folders so that you can share media (movies, songs and pictures) with other devices on your network.

Media Sharing Settings

Enable Media Sharing	Click this box to enable media sharing on your USB device.
Media Sharing Name	Use this field to specify the folder that you want to make available for media sharing.

USB Access Control



USB access control lets you specify which USB devices are allowed to have access to your network.

Enable USB Access Control Select this box if you want to turn on USB access control. USB access control is disabled by default.

Approved USB Device

This section shows the USB devices that are able to access your network. If you want to restrict a device so that it cannot access your network, select the device and click Delete.

Attached USB Device

This section shows the USB devices which are attached to your router.

Utilities

System Information

The screenshot displays the 'System Information' page within the Spectrum router's utility menu. The page is titled 'System Information' and includes a sub-header 'This page shows a summary of your system's status.' The content is organized into several sections: Hardware and Software Versions, WAN Status Summary, LAN Status Summary, and Other Features Summary. Each section contains a table of system parameters and their current values.

Hardware and Software Versions	
Serial Number	H1P2UU100000018
Bootcode Version	1.00.0
Hardware Version	1.0
Firmware Version	A1.00.004-170612

WAN Status Summary	
WAN MAC Address	5C:8F:E0:07:35:00
Connection Setup	Dynamic
IP Address	10.2.75.67
Subnet Mask	255.255.255.0
Primary DNS	10.0.248.1
Secondary DNS	10.43.1.1
Gateway	10.2.75.254

LAN Status Summary	
LAN MAC Address	5C:8F:E0:07:34:FF
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
DHCP Server	Enabled

Other Features Summary	
Firewall Settings	Enabled
SSID	MySpectrumWiFi00-2G
Security	WPA2-PSK
UPnP	Enabled
Remote Management	Disabled
WPS	Disabled

This page shows a summary of the system's status.

Hardware Software Version

Serial Number	This field displays the serial number of your router.
Bootcode Version	This field displays the bootcode version.
Hardware Version	This field displays the hardware version.
Firmware Version	This field displays the firmware version.

WAN Status Summary

WAN MAC Address	This field displays the WAN MAC address.
Connection Setup	This field displays the connection type: Dynamic or Static.
IP Address	This field displays the WAN IP address.
Subnet Mask	This field displays the WAN subnet mask.
Primary DNS	This field displays the Primary DNS IP address.
Secondary DNS	This field displays the Secondary DNS IP address.
Gateway	This field displays the gateway IP address.

LAN Status Summary

MAC Address	This field displays the LAN MAC Address.
IP Address	This field displays the IP Address of the LAN.
Subnet Mask	This field displays the subnet mask of the LAN.
DHCP Server	This field displays the status of the DHCP Server: Enabled or Disabled.

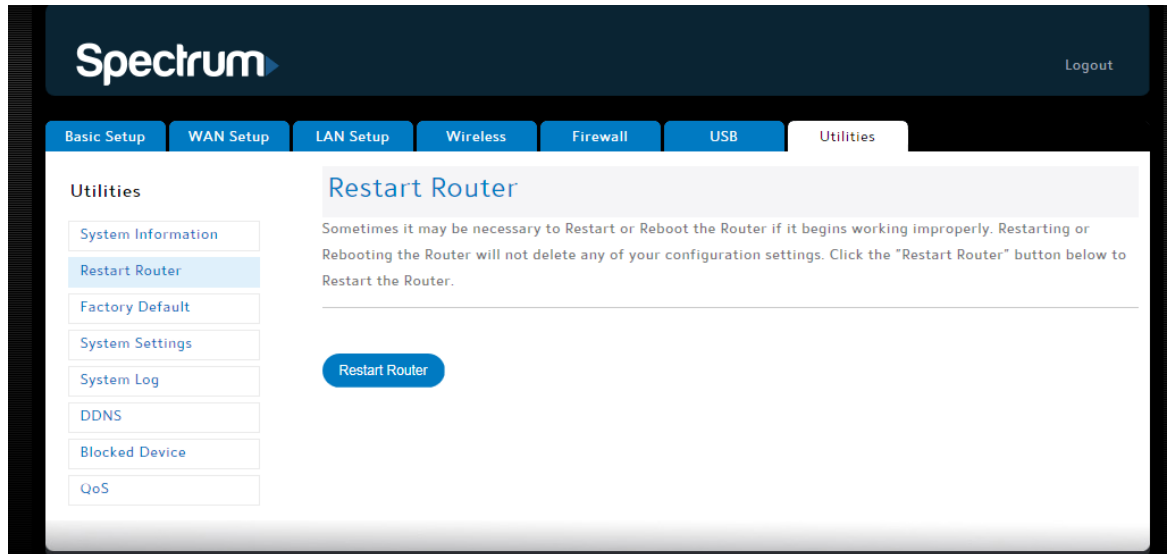
Other Features Summary

Firewall Settings	This field indicates whether the firewall settings are enabled or disabled.
SSID	This field indicates the network name (SSID).
Security	This field indicates the security mode.
UPNP	This field indicates whether the UPnP feature is enabled or disabled.

Remote Management	This field indicates whether the Remote Management feature is enabled or disabled.
-------------------	--

WPS	This field indicates whether the WPS function is enabled or disabled.
-----	---

Restart Router

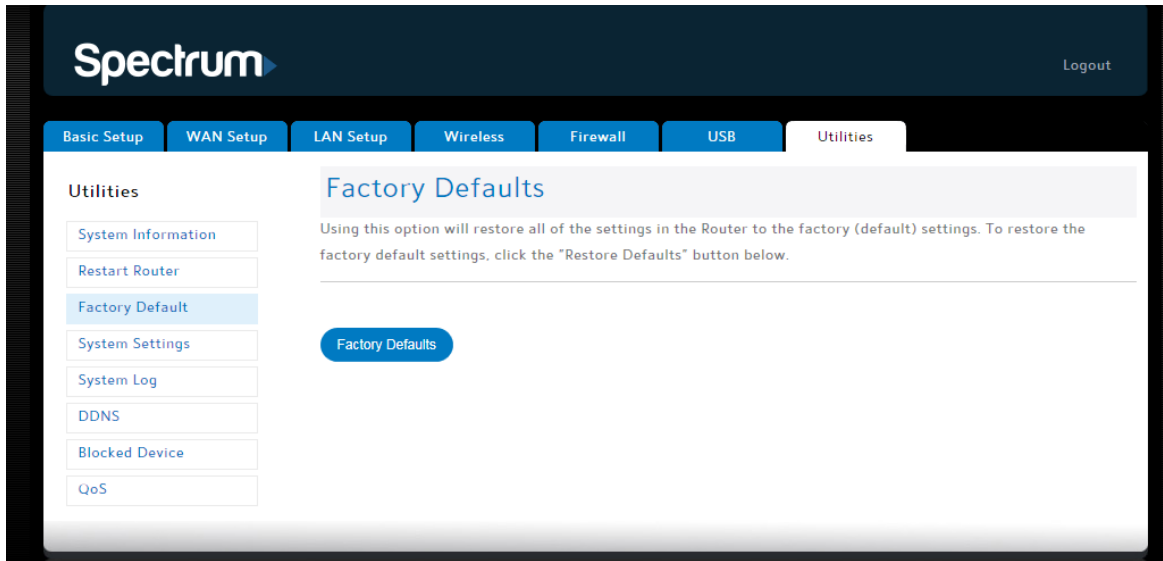


It may be necessary to restart (reset) the router if it stops working properly. Restarting the router will not delete any of the configuration settings.

To restart the router, click Restart.

Note: A dialog box prompts you to confirm that you want to restart the router. Click OK to restart now or click Cancel to restart later.

Factory Defaults



This screen lets you revert all of the router's configuration settings to the factory default setting.

Click [Factory Defaults](#) to revert to the factory default configuration settings.

Note: A dialog box prompts you to confirm that you want to restore the factory default settings. Click OK to restore now or click Cancel if you do not want to restore now.

System Settings

This page allows you to make certain system settings. For changes to take effect, you must click Apply.

Administrator Login

Current Password	Enter the old password to change the administrator password.
New Password/ Confirm New Password	Enter the new password in both fields to change the administrator password.

Login Timeout	Enter the number of minutes that these web pages can remain idle before the user is logged out.
Time And Time Zone	
Current Time	Displays the current time.
Current Language	Select the language you want to see displayed in the GUI.
Time Zone	Select the time zone.
Daylight Savings	Click this checkbox to automatically update the system clock for Daylight Saving Time.
NTP Server 1-5	The host name or IP addresses of the NTP servers that you want to use. 1-4 allow you to select a server from a drop-down list. 5 allows you to type in a server name.

System Logs

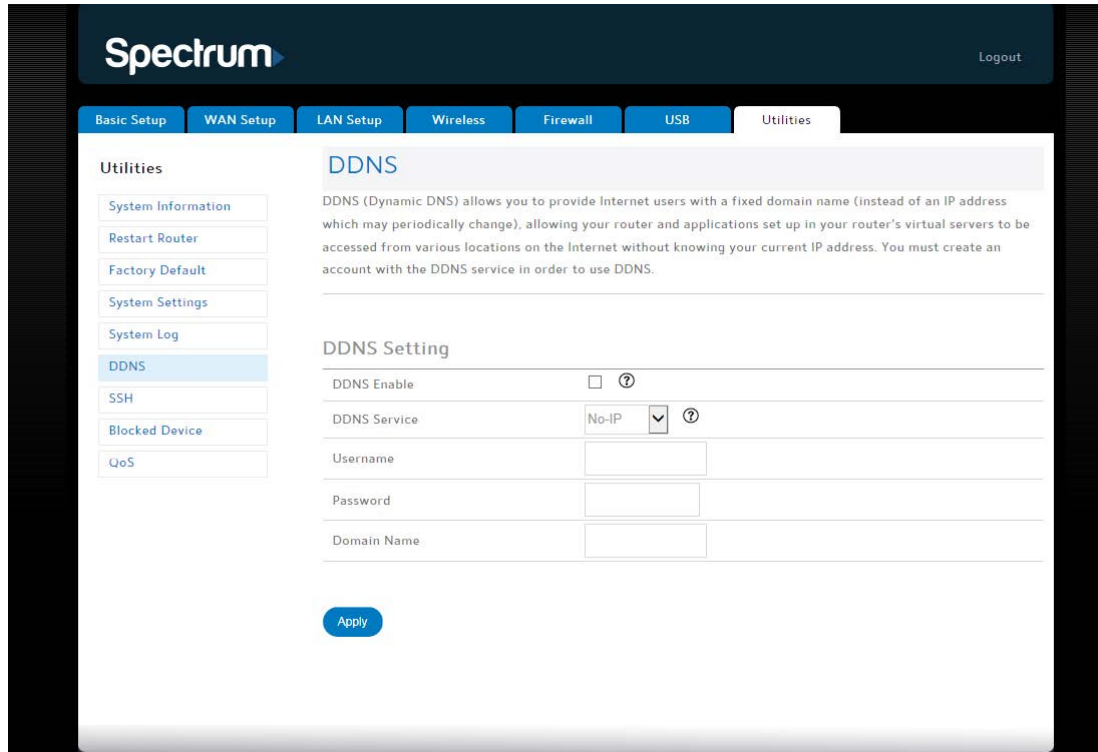
The screenshot shows the Spectrum router configuration interface. At the top, the 'Spectrum' logo and a 'Logout' link are visible. Below the logo is a navigation bar with tabs for 'Basic Setup', 'WAN Setup', 'LAN Setup', 'Wireless', 'Firewall', 'USB', and 'Utilities'. The 'Utilities' tab is active, and a sidebar on the left lists various utility options: 'System Information', 'Restart Router', 'Factory Default', 'System Settings', 'System Log' (highlighted), 'DDNS', 'Blocked Device', and 'QoS'. The main content area is titled 'System Logs' and contains the text: 'This page displays the system logs. Click the Refresh button to update the list.' Below this is a 'Log' section with a scrollable text area containing the following log entries:

```
[DHCP] DHCP IP 192.168.1.2 is assigned to client 'LP-BLEWIS-01',
Monday, Jun. 19,2017 07:11:28
Time synchronized with 'us.pool.ntp.org', Monday, Jun. 19,2017
07:11:08
[Authorization] admin unauthorized login from IP 192.168.1.2, Monday,
Jun. 12,2017 00:46:28
[DHCP] DHCP IP 192.168.1.2 is assigned to client 'LP-BLEWIS-01',
Monday, Jun. 12,2017 00:46:04
[NTP]Delay 139 seconds before time synchronizing, Monday, Jun.
12,2017 00:45:41
[WAN] WAN connected(IP: 10.2.75.67), Monday, Jun. 12,2017
00:45:36
[WAN] WAN link up, Monday, Jun. 12,2017 00:45:29
[WLAN] 5G Channel changed, previous channel = 36, current channel
=40, Monday, Jun. 12,2017 00:45:22
[WLAN] 5G Channel changed, previous channel = 0, current channel =36,
Monday, Jun. 12,2017 00:45:17
[WLAN] 2.4G Channel changed, previous channel = 0, current channel
=1, Monday, Jun. 12,2017 00:45:15
[DHCP] DHCP IP 192.168.1.2 is assigned to client 'LP-BLEWIS-01',
Monday, Jun. 12,2017 00:45:09
```

At the bottom of the log viewer is a blue 'Refresh' button.

This page displays the system logs. These may include GUI login authentication logs, TR069 logs, NTP logs, and Wi-Fi access logs, among others. Click Refresh to update the list.

DDNS



DDNS (Dynamic DNS) lets you give Internet users a fixed domain name (instead of an IP address which may periodically change). This allows various locations on the Internet to access the router and the applications that are set up in the gateway's port forwarding table without knowing your current IP address. For changes to take effect, you must click Apply.

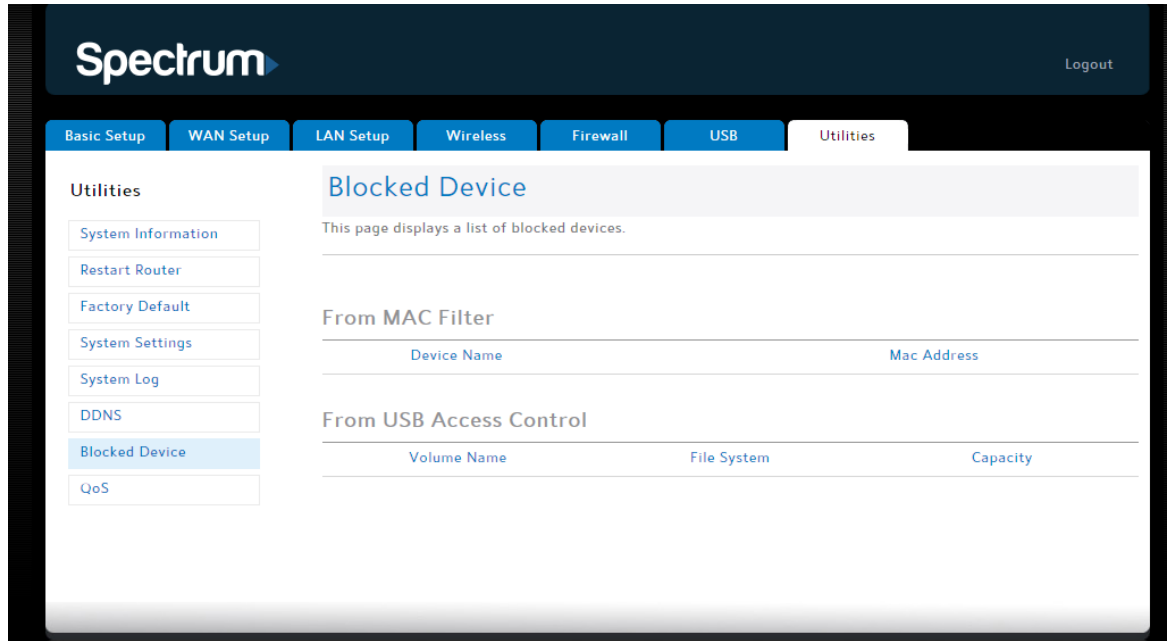
Note: You must first create an account with a DDNS provider in order to use DDNS. The DDNS provider maps the chosen domain name to your IP address.

DDNS Setting

DDNS Enable	Click this checkbox to enable DDNS on the system.
DDNS Service	Sets the DDNS provider that the account uses. Available options are No-IP, DuckDNS and Dynu.
User Name	Enter the user name for the DDNS account.

Password	Enter the password for the DDNS account (provided by your DDNS provider).
Domain Name	Enter the domain name you selected to use with the DDNS account.

Blocked Device



This page shows a list of devices that have been blocked from your router, listed by MAC filter and USB access control.

From MAC Filter

Device Name	The host name of a client for which an explicit MAC filter has been set up on the Firewall: MAC Filter page.
MAC Address	The MAC address of a client for which an explicit MAC filter has been set up on the Firewall: MAC Filter page.

From USB Access Control

Volume Name	The volume name of a USB device for which an explicit USB access control has been set up on the USB: USB Access Control page.
File System	The file system method (such as FAT, NTFS and so on) of a USB device for which an explicit USB

	access control has been set up on the USB: USB Access Control page.
Capacity	The capacity of a USB device for which an explicit USB access control has been set up on the USB: USB Access Control page.

QoS

The screenshot shows the Spectrum router configuration interface. At the top, there's a navigation bar with tabs for Basic Setup, WAN Setup, LAN Setup, Wireless, Firewall, USB, and Utilities. The Utilities tab is selected. On the left, there's a sidebar menu with options like System Information, Restart Router, Factory Default, System Settings, System Log, DDNS, Blocked Device, and QoS. The main content area is titled 'QoS' and contains the following elements:

- A description: "QoS is an advanced feature that you can use to prioritize some Internet applications and online gaming, and to minimize the impact when the bandwidth is busy."
- An 'Enable QoS' checkbox, which is currently unchecked.
- An 'Apply' button.
- An 'Uplink bandwidth Maximum' input field with a 'SpeedTest' button next to it.
- A 'QoS Policy' section containing a table with columns for QoS Policy, Priority, Device Name, and MAC Address.
- Below the table, there are input fields for 'QoS Policy for', 'MAC Address', and 'Device Name', and a 'Priority' dropdown menu set to 'Highest'.
- At the bottom of the policy section, there are buttons for 'Add', 'Edit', 'Delete', and 'Reset'.

Quality of Service (QoS) refers to the overall performance of your network. This screen allows you to prioritize certain applications such as online gaming while minimizing the effects on network performance during busy periods.

Enable QoS	Click this checkbox to enable QoS Prioritization.
------------	---

Router Configuration Screen Descriptions

Uplink bandwidth Maximum	Enter the highest speed that you want to allow for uploads in this policy.
SpeedTest	Click this button to run a speed test and verify your connection speed.
QoS Policy for	Enter a name for this QoS policy.
MAC Address	Enter the MAC address of the client device that will be affected by this policy
Device Name	Enter a name for the client device that will be affected by this policy.
Priority	Choose the priority for this policy. In the event of conflicting policies, this priority will be used to determine which policy takes precedent.

Troubleshooting

The router is plugged in, but the light is off

Check all power connections. Is the power cord plugged in firmly at both ends?

If you plugged the power cord into a power strip, make sure the strip is switched on.

Try to plug the power cord into a different outlet. If the outlet is controlled by a wall switch, make sure the switch is on.

Finally, check the fuse or circuit breaker panel.

I'm not getting on the Internet (all connections)

It may take several minutes to establish a connection the first time you power up the router, especially when many people are online. Always leave the router plugged into AC power and connected to the modem.

Check the light on the front. It should be blue.

Check the cable connections. Connectors should be tight. Cables should not be pinched, kinked, or bent sharply—any of these can cause a break or short in the cable. (You may have to replace the cable).

Proceed to the Ethernet or wireless solutions if necessary.

I'm not getting on the Internet (Ethernet)

If you are using a switch, is the switch turned on?

Are you using the right type of Ethernet cable? Use an RJ45 Cat5e cable for direct connection to a computer; use a cross-over cable for connection to a switch.

Unplug the power from the router and wait a few seconds, then plug the power back in.

A misconfiguration could lock out all access to the router. If you think this has happened, see [Factory Defaults](#) (page 82).

I'm not getting on the Internet (Wireless)

Check the light on the front. It should be blue.

Does the connection utility discover your wireless LAN? If you turned off "Broadcast Wi-Fi Network Name (SSID)" you need to manually enter the name of the wireless LAN in the connection utility.

Change the security setting to another setting.

A misconfiguration could lock out all access to the router. If you think this has happened, see *Factory Defaults* (page 82).

Make sure that your wireless device is compatible with the wireless mode that you selected. See *Setting the Wireless Mode* (page 22).

My wireless Internet connection stops working sometimes

This may be caused by distance or interference. Try moving the device closer to the router.

Two common sources of interference are 2.4 GHz “remote” telephones and microwave ovens. If you cannot remove the interfering product, try using a different channel.

I can get on the Internet, but everything is slow

If the Web site you are visiting is very popular, that site may be having trouble servicing all the requests. If other sites download quickly, wait for a few minutes and try again. Web site traffic during peak hours may also affect the connection speed.

Other communications on the LAN, or interference with wireless connections, may slow down the connection.

Safety Requirements

The RAC2V1A router complies with the applicable requirements for performance, construction, labeling and information when used as outlined below:

- Do not use product near water (i.e. wet basement, bathtub, sink or near a swimming pool, etc.), to avoid risk of electrocution.
- The product shall be cleaned using only a damp, lint-free, cloth. No solvents or cleaning agents shall be used.
- Do not use spray cleaners or aerosols on the router.
- Avoid using and/or connecting the equipment during an electrical storm, to avoid risk of electrocution.
- Do not locate the equipment within 6 feet (1.9 m) of a flame or ignition source (i.e. heat registers, space heaters, fireplaces, etc.).
- Use the power adapter included with the equipment.
- Equipment should be installed near the power outlet and should be easily accessible.
- In areas of high surge events or poor grounding situations and areas prone to lightning strikes, additional surge protection may be required (i.e. PF11VNT3 from American Power Conversion) on the AC and Ethernet lines.
- When the router is connected to a local computer through Ethernet cables, the computer must be properly grounded to the building/residence AC ground network. All plug-in cards within the computer must be properly installed and grounded to the computer frame per the manufacturer's specifications.
- Ensure proper ventilation. Position the router so that air flows freely around it and the ventilation holes on the unit are not blocked.
- Do not mount the router on surfaces that are sensitive to heat and/or which may be damaged by the heat generated by the modem or its accessories.

Federal Communication Commission Interference 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 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 Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This 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.

IMPORTANT NOTE:

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 25cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/CANADA

Operation of this device is restricted to indoor use only

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