

# Verizon FiOS® Router Model 9100EM

## User Guide



# CONTENTS

- 1. PRODUCT DESCRIPTION .....5
- 2. REGULATORY INFORMATION .....6
  - 2.1 FCC Compliance Note .....6
  - 2.2 Canada Certification Notice .....7
- 3. NETWORKING REQUIREMENTS .....8
- 4. HARDWARE FEATURES .....9
  - 4.1 LED Indicators .....9
  - 4.2 Cable Connectors and Switch Locations .....10
  - 4.3 Front Panel LEDs .....11
  - 4.4 Connector Descriptions .....12
- 5. INSTALLING THE ROUTER .....13
  - Before you begin .....13
  - 5.1 Connecting Your Verizon Router to Your Broadband (Internet) Service .....14
  - 5.2 Connecting Ethernet Devices to Your Router .....15
  - 5.3 Connecting Wireless Devices to Your Router .....16
- 6. ACCESSING YOUR ROUTER .....17
  - 6.1 Logging on to Your Router .....17
- 7. CONFIGURING YOUR BROADBAND CONNECTION .....20
  - 7.1 Confirming Your Coax Connection .....20
  - 7.2 Connecting to the Internet .....20
  - 7.3 Logging Out of the Router’s Web Pages .....25
- 8. CONFIGURING YOUR DEVICE FOR DHCP .....26
  - 8.1 Configuring DHCP in Macintosh OS X .....26
  - 8.2 Configuring DHCP in Windows Vista .....32
  - 8.3 Configuring DHCP in Windows XP .....36
- 9. BASIC CONFIGURATION .....41
- 10. MAIN (HOME PAGE) .....42
  - 10.1 Router Status .....43
  - 10.2 Quick Links .....43
  - 10.3 Network Status .....43
  - 10.4 Start Surfing .....43
- 11. WIRELESS .....44



03/24/09 - DRAFT

*Verizon FiOS Router (Model 9100EM)*

*User Guide*

11.1	Wireless Status.....	44
11.2	Basic Security Settings .....	45
11.3	Advanced Security Settings .....	48
11.4	Device List.....	67
12.	MY NETWORK.....	68
12.1	Network Status.....	68
12.2	Network Connections.....	76
13.	FIREWALL SETTINGS .....	100
13.1	General Firewall Security Settings.....	101
13.2	Access Control.....	102
13.3	Port Forwarding .....	108
13.4	DMZ Host.....	120
13.5	Port Triggering.....	121
13.6	Remote Admin.....	129
13.7	Static NAT.....	130
13.8	Advanced Filtering.....	133
13.9	Security Log.....	137
13.10	Connections .....	139
14.	PARENTAL CONTROLS .....	141
15.	ADVANCED.....	145
15.1	Diagnostics.....	146
15.2	Restore Defaults.....	147
15.3	Reboot.....	148
15.4	MAC Cloning .....	148
15.5	ARP Table.....	149
15.6	Users .....	151
15.7	Quality of Service .....	157
15.8	Remote Administration.....	170
15.9	DNS .....	171
15.10	Personal Domain (Dynamic DNS).....	172
15.11	Network Objects .....	174
15.12	Protocol.....	176
15.13	MGCP ALG.....	189
15.14	SIP ALG .....	190



03/24/09 - DRAFT

*Verizon FiOS Router (Model 9100EM)*

*User Guide*

15.15	UPnP .....	190
15.16	System Settings.....	191
15.17	Configuration File.....	193
15.18	Date and Time Rules.....	194
15.19	Editing the Time Server Table.....	195
15.20	Editing Clock Set .....	196
15.21	Scheduler Rules .....	196
15.22	Firmware Upgrade .....	199
15.23	Routing.....	202
15.24	IGMP Configuration .....	204
15.25	IGMP Status.....	206
15.26	PPPoE Relay .....	206
15.27	IP Address Distribution.....	207
16.	SYSTEM MONITORING.....	208
16.1	Router Status.....	208
16.2	Advanced Status.....	209
17.	TECHNICAL SUPPORT INFORMATION .....	213
18.	PRODUCT SPECIFICATIONS.....	213
19.	SOFTWARE LICENSE AGREEMENT.....	214
20.	PUBLICATION INFORMATION.....	216



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 1. PRODUCT DESCRIPTION

The Verizon® FiOS® Router is designed to deliver today’s most exciting broadband services to and throughout your home. Built around a state-of-the-art, dual-core network processor, this versatile product helps ensure that data and services reach your connected home devices without interruption or delay. The Router allows you to transfer data over your existing in-home coax cables and simultaneously supports both “wired” and “wireless” connection options. This flexibility allows for the connection of a wide range of network enabled devices such as desktop computers, laptop computers, digital media players, and network attached storage (NAS) units.

Hereafter, the Verizon FiOS Router will be referred to as the “Router.”

Key Features:

- Multimedia over Coax interface (MoCA)
- 4-Port 10/100 BaseT Ethernet LAN switch
- Integrated 802.11g Access Point
- Embedded Firewall
- IP Quality of Service
- IGMP Proxy Functionality

The Verizon FiOS® Router is powered by an ENERGY STAR® qualified adapter.



Powered by an  
ENERGY STAR®  
qualified adapter  
for a better  
environment

This User Guide is intended to provide installation and configuration information on the Verizon® FiOS® Router and assumes the user of this Router has a medium to advanced understanding of computing, routing and internet networking.



## 2. REGULATORY INFORMATION

### 2.1 FCC Compliance Note

(FCC ID: CH8ULS3-C)

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to a different circuit from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**WARNING:** While this device is in operation, a separation distance of at least 20 cm (8 inches) must be maintained between the radiating antenna and users exposed to the transmitter in order to meet the FCC RF exposure guidelines. Making changes to the antenna or the device is not permitted. Doing so may result in the installed system exceeding RF exposure requirements. This device must not be co-located or operated in conjunction with any other antenna or radio transmitter. Installers and end users must follow the installation instructions provided in this guide.

**Modifications made to this device, unless expressly approved, could void the users' rights to operate this device.**

#### PART 68 – COMPLIANCE REGISTRATION

This equipment is designated to connect to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant. An FCC compliant telephone cord and modular plug is provided with the equipment. See the Installation Information section of this User Guide for details.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instruction for details.

If this terminal equipment (Model 9100EM) causes harm to the telephone network, the telephone company may request you to disconnect the equipment until the problem is resolved. The telephone company will notify you in advance if temporary discontinuance of service is required. If advance notification is not practical, the telephone company will notify you as soon as possible. You will be advised of your right to file a complaint with the FCC if you believe such action is necessary. If you experience trouble with this equipment (Model 9100EM), do not try to repair the equipment yourself. The equipment cannot be repaired in the field. Contact Verizon for instructions.



03/24/09 - DRAFT

*Verizon FiOS Router (Model 9100EM)*

*User Guide*

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

If your home has specially wired alarm equipment connected to the telephone line, ensure that the installation of this equipment (Model 9100EM) does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer. This equipment cannot be used on public coin phone service provided by the telephone company. Connection of this equipment to party line service is subject to state tariffs.

## 2.2 Canada Certification Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operations and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The department does not guarantee the equipment will operate to the user's satisfaction.

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specification. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment. The Ringer Equivalence Number (REN) is 0.0. The Ringer Equivalence Number that is assigned to each piece of terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local Telecommunication Company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Connection to a party line service is subject to state tariffs. Contact the state public utility commission, public service commission, or corporation commission for information.

If your home has specially wired alarm equipment connected to the telephone line, ensure that the installation of this equipment (Model 9100EM) does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

If you experience trouble with this equipment (Model 9100EM), do not try to repair the equipment yourself. The equipment cannot be repaired in the field and must be returned to the manufacturer. Repairs to certified equipment should be coordinated by a representative, and designated by the supplier. Contact Verizon for instructions.

The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five. Users should ensure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal, metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



**Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.**



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

### 3. NETWORKING REQUIREMENTS

The following minimum system specifications are required for optimum performance of your Router.

#### Requirements for 10/100 Base-T/Ethernet

- Pentium® or equivalent class machines or higher
- Microsoft® Windows® (Vista, XP, 2000, ME, NT 4.0, 98 SE) Macintosh® OS X, or Linux installed
- 64 MB RAM (128 MB recommended)
- 10 MB of free hard drive space
- 10/100 Base-T Network Interface Card (NIC)
- Internet Explorer 5.5 or later or Netscape Navigator 7.x or higher or Firefox 1.0.7 or later
- Computer Operating System CD-ROM

#### Requirements for Wireless

- Pentium® or equivalent class machines or higher
- Microsoft® Windows® (Vista, XP, 2000, ME, 98 SE) installed
- 64 MB RAM (128 MB recommended)
- 10 MB of free hard drive space
- Internet Explorer 5.5 or later or Netscape Navigator 7.x or higher or Firefox 1.0.7 or later
- IEEE 802.11b/g PC adapter
- Computer operating system CD-ROM

#### System Requirements for Coax

- Pentium® or equivalent class machines or higher
- Microsoft® Windows® (Vista, XP, 2000, ME, 98 SE) installed
- 64 MB RAM (128 MB recommended)
- 10 MB of free hard drive space
- Internet Explorer 5.5 or later or Netscape Navigator 7.x or higher or Firefox 1.0.7 or later
- Computer operating system CD-ROM





## 4. HARDWARE FEATURES

### 4.1 LED Indicators

This section explains the Router's LED states and descriptions. View the LEDs to confirm the unit's operation and status.

Front Panel LEDs		
LED	State	Description
POWER	Solid Green	Power is ON.
	Flashing Green	Router is performing power on self test (POST).
	Solid Red	Router failed POST or Device Malfunction. Note: The Power LED should be red no longer than two seconds after the power on self test passes.
	OFF	Power is OFF.
WAN COAX	Solid Green	WAN physical link established.
	Flashing Amber	Low signal rate or noisy Coax line. Service should not be affected.
	OFF	Router power is OFF or no WAN signal detected.
WAN ETHERNET	Solid Green	WAN link established.
	OFF	Router power is OFF or no WAN signal detected.
INTERNET	Solid Green	Internet link established; the Router has a WAN connection and IP address.
	Flashing Green	Internet link established; IP traffic is passing through the device in either direction.
	Amber	Internet link not established or attempting to establish.
	OFF	Router power is OFF or the Router does not have a WAN address.
WIRELESS SETUP	Solid Green	LED currently disabled
	OFF	LED currently disabled
1,2,3,4 (LAN ETHERNET)	Solid Green	Powered device is connected to the associated port.
	Flashing Green	10/100 Base-T LAN activity is present (traffic in either direction).
	OFF	Router power is OFF, or no cable or no powered device is connected to the associated port.
LAN COAX	Solid Green	A physical connection has been established.
	Flashing Green	Activity is present on the Coax link.
	OFF	Router power is OFF.
WIRELESS	Solid Green	Wireless link established. Wireless LAN activity is present (traffic in either direction). IP connection established and IP traffic is passing through device.
	OFF	Router power is OFF or No wireless link.
Rear Panel LEDs		
Left Ethernet LED	Solid Green	100 Mbps link established.
	Flashing Green	LAN activity at 100 Mbps (traffic in either direction).
	OFF	No 100 Mbps link.
Right Ethernet LED	Solid Green	10 Mbps link established.
	Flashing Green	LAN activity at 10 Mbps (traffic in either direction).
	OFF	No 10 Mbps link.



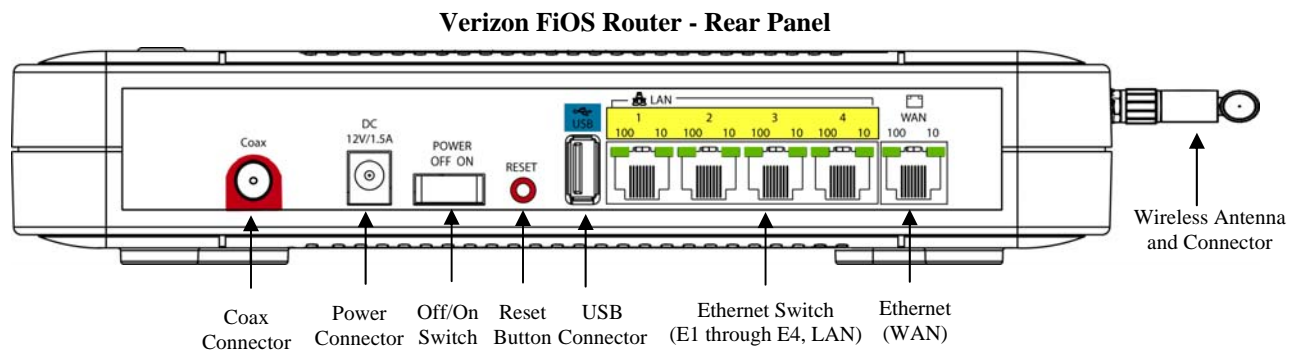
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 4.2 Cable Connectors and Switch Locations

- Coax connector
- Reset push button
- USB connector
- Four LAN Ethernet connectors (RJ-45)
- WAN Ethernet connector (RJ-45)
- Power connector (12 VDC) barrel
- OFF/ON power switch
- Wireless 802.11b/g SMA connector and antenna





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

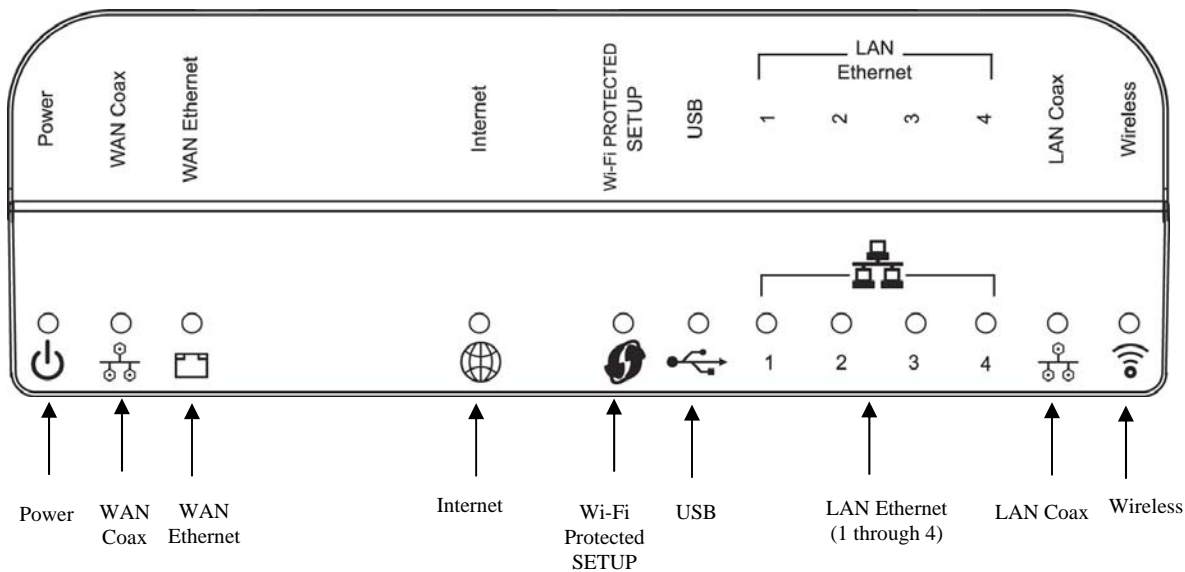
User Guide

### 4.3 Front Panel LEDs

- Power
- WAN Coax
- WAN Ethernet
- Internet
- Wi-Fi Protected SETUP (Currently Disabled)
- USB
- LAN Ethernet (1,2,3,4)
- LAN Coax
- Wireless

#### UPCOMING CHANGES TO FRONT PANEL

Verizon FiOS Router - Front Panel LEDs





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 4.4 Connector Descriptions

The following chart describes the Router's rear panel connector and switches.

NAME	TYPE	FUNCTION
COAX	F-type coaxial connector	Connects the Router to the in home coaxial cabling. Compatible with the Multimedia over Coax Alliance (MoCA) standards.
USB	USB Connector	Connects the Router to peripheral devices (e.g. storage) via USB. Note: This port may not be enabled in all UltraLine Series3 units.
LAN	8-pin (RJ-45) modular jack	Connects the the Router's 10/100 Base-T Ethernet switch to a local computer or other Ethernet-enabled device.
WAN	8-pin (RJ-45) modular jack	Connects the Router to a broadband modem or router, enabling access to the Internet or Wide Area Network (WAN).
POWER	Barrel connector	Connects to the Router's DC 12V power supply. <b>Only use the power supply provided with the Router.</b>
OFF/ON	Off/On Switch	Allows you to turn the Router on or off.
WIRELESS ANTENNA and CONNECTOR	SMA connector and antenna	Antenna for trasmitting and receiving wireless signals for Wi-Fi (802.11b/g) connected devices.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 5. INSTALLING THE ROUTER

This section explains the hardware installation procedures for connecting your Router to your broadband service as well as to devices in your home, such as computers or media players.

### Before you begin

Make sure that your kit contains the following items:

- Verizon FiOS Router
- Power Supply
- RJ-45 Ethernet cable (straight-through) (yellow)
- RJ-45 Ethernet cable (straight-through) (white)
- Verizon CD-ROM containing User Guide in PDF format
- Wireless antenna
- Router Stand

**Before you install your Router, please read the following notes:**

#### NOTE:

1. It is recommended that you use a surge suppressor to protect equipment attached to the power supply. **Use only the power supply provided with your kit.**
2. If the Ethernet card in your PC does not auto-negotiate, set it to half duplex. Refer to the Ethernet card manufacturer's instructions for installing and configuring your Ethernet card.
3. Additional Ethernet cables may be required depending on the installation method you are using. Ethernet cables can be purchased at your local computer hardware retailer.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 5.1 Connecting Your Verizon Router to Your Broadband (Internet) Service

The following sections provide instructions on connecting your Verizon Router to your broadband Internet service. Follow the instructions for the connection type that you will use to connect to the Internet.

### Connecting your Router to the Internet via Ethernet Cable

To install your Verizon Router via Ethernet cable to your existing network, follow the steps outlined below:

1. Ensure that your existing network device is installed and has an active Internet connection.
2. Obtain a 10/100 Base-T Ethernet cable, and plug one end of the cable into the port marked **WAN** on the rear panel of your Verizon Router. Then, plug the other end of the Ethernet cable into the Ethernet port on your existing broadband device.

**NOTE:** The broadband device to which your Verizon Router is connected is your WAN interface to the Internet.

3. Plug the small end of the power supply cord into the connector marked **12 VDC** on the rear panel of your Router. Plug the other end of the power supply into an AC wall socket.
4. Make sure the existing device on your network is powered on.
5. Turn on the Verizon Router (if it is not already on) by pressing the **Power** switch on the back of the Router.
6. Check the front of the Verizon Router to see if the **Power** LED is solid green. Solid green indicates that the Router is powered on.
7. Check to see if the **WAN Ethernet** LED is solid green. Solid green indicates that WAN Ethernet is working properly.

Now that you have connected your Router to your broadband service and turned on the Router, you can connect Ethernet and Wireless devices to the Router, allowing for Internet connection throughout your home without disrupting your cable or satellite television services. Refer to the following sections for instructions on connecting networking devices to your Router:

- Section 5.2 explains how to connect Ethernet devices to your broadband Router.
- Section 5.3 explains how to connection Wireless devices to your broadband Router.

### Connecting to your Router to the Internet via Coaxial Cable

To install your Verizon Router via coaxial cable to your existing network, follow the steps outlined below:

1. Connect one end of your coaxial cable to the coax connection on you wall. Connect the other end of the coaxial cable to the connector marked **Coax** on the Router.
2. Connect the power supply cord to the power connector marked **12 VDC** on the back of the Router. Plug the other end of the power supply into an AC wall socket, and then turn on the Router by pressing the Off/ON switch on the back of the Router.
3. Check to see if the Router's **Power** LED is solid green. This indicates that the Router is powered on.
4. Check to see if the Router's **WAN Coax** LED is solid green. This means the Coax connection is functioning properly. (Note: Your **WAN Coax** LED may also be amber which is acceptable)



03/24/09 - DRAFT

*Verizon FiOS Router (Model 9100EM)*

*User Guide*

Now that you have connected your Router to your broadband service and turned on the Router, you can connect Ethernet and Wireless devices to the Router, allowing for Internet connection throughout your home without disrupting your cable or satellite television services. Refer to the following sections for instructions on connecting networking devices to your Router:

- Section 5.2 explains how to connect Ethernet devices to your broadband Router.
- Section 5.3 explains how to connection Wireless devices to your broadband Router.

## 5.2 Connecting Ethernet Devices to Your Router

To connect PCs to your Router using 10/100-BaseT Ethernet installation, please follow the steps below:

1. Connect your Router to your broadband service as explained in section 5.1.
2. Connect the yellow Ethernet cable (provided with your kit) from any one of the four Ethernet jacks marked **1, 2, 3, 4** on the back of the Router to the Ethernet port on your computer. Turn on the computer.

**NOTE:** Use any of the four LAN Ethernet jacks on the Router's rear panel; each jack serves as an Ethernet switch. Repeat this step to connect up to three additional PCs to the Router.

3. Check to see if the Router's **Power** LED is solid green. This indicates that the Router is powered on.
4. Check to see if any of the Router's **LAN Ethernet** LEDs (1,2,3,4) are solid green. Solid green indicates that the Ethernet connection is functioning properly. Check the **LAN Ethernet** LED for each Ethernet jack to which you are connected at the rear of the Router.
5. Check to see if the Router's **WAN Coax** LED is solid green (or flashing amber). This means the Coax connection is functioning properly.
6. After you have logged on to you account and established an Internet connection, as explained later in this document, check to see if the Router's **Internet** LED is solid green. Solid green indicates that the Internet link has been established.

Congratulations! You have completed the steps to connect Ethernet devices to your Router. Now proceed to section 6 to access your Router's Web pages.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

### 5.3 Connecting Wireless Devices to Your Router

**IMPORTANT:** If you are connecting to the Router via a wireless network adapter, the SSID must be the same for both the Router and your PC's wireless network adapter. The default SSID for the Router is the serial number of the unit (located below the bar code on the bottom of the router and also on the shipping carton). The SSID is also provided in the Router's Web pages, in the Wireless section. On your PC, locate and run the utility software provided with your PC's wireless network adapter. Then, enter the Router's SSID value (in order to communicate with the Router, the PC's wireless network adapter must be configured with the SSID). Later, for privacy, you can change the SSID by following the procedures outlined in section 11.2, "Basic Security Settings."

**NOTE:** Client PCs can use any Wireless 802.11b/g card to communicate with the Router. By default your Router is enabled for Wired Equivalent Privacy (WEP) security. Whenever, WEP is configured in the Router, the PC's wireless card must use the same WEP security code type as the one provided in Router. The WEP security code is also located on a label on the bottom of the Router. Always check that your PC's wireless adapter is configured properly for whichever network setting you use: WEP or WPA. You can configure the settings in the advanced properties of the PC's wireless network adapter.

To network your Router to PCs in your home or office using a wireless installation, follow the steps below:

1. Connect your Router to your broadband service as explained in section 5.1.
2. Ensure that each PC on your wireless network has an 802.11b/g wireless network adapter installed.
3. Ensure that appropriate drivers for your wireless adapter have been installed on each PC.
4. Make sure the wireless antenna is screwed on to the connector on the rear of the router and firmly locked into place. Then, orient the antenna to appropriate position.
5. Connect the power supply cord to the power connector marked **12 VDC** on the back of the Router. Plug the other end of the power supply into an AC wall socket, and then power up the Router.
6. Check to see if the Router's **Power** LED is solid green. This indicates that Router is powered on.
7. Check to see if the Router's **WAN Coax** LED is solid green (or flashing amber). This means the Coax connection is functioning properly.
8. Check to see if the Router's **Wireless** LED is solid green. This means that the wireless interface is functioning properly.
9. After you have logged on to your account and established an Internet connection, as explained later in this document, check to see if the Router's **Internet** LED is solid green. Solid green indicates that an Internet link has been established.

Congratulations! You have completed the steps to connect wireless devices to your Router. Now proceed to section 6 to access your Router's Web pages.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 6. ACCESSING YOUR ROUTER

### 6.1 Logging on to Your Router

This section explains the logon procedures for your Verizon Broadband Router. This procedure should be used any time you want to access or make changes to the Router's configurable settings, such as wireless security and firewall.

**IMPORTANT:** Your Router is capable of automatically sensing protocol type (DHCP or PPPoE). This process is designed to start after you have connected the Router. To access your Router, your PC must be configured for DHCP. Refer to your Windows help screen for information on configuring your computer for DHCP. At your PC, click **Start**, then click **Help** to access the Windows® help screen.

To log on to the Router, start your Web browser, and then type the following IP address in the browser's address bar:

**http://192.168.1.1**

After you type the IP address, press **Enter** on your keyboard. The following screen will display the message:

This is your first login to the Management Console. Use http://192.168.1.1 in order to access the Router's Management Console. To conveniently access the Management Console, you can click Add to Favorites. You should make sure that cookies are enabled in the browser. To enable cookies, go to Tools->Internet Options->Privacy->Advanced.

Click **OK** in the **Welcome** screen.





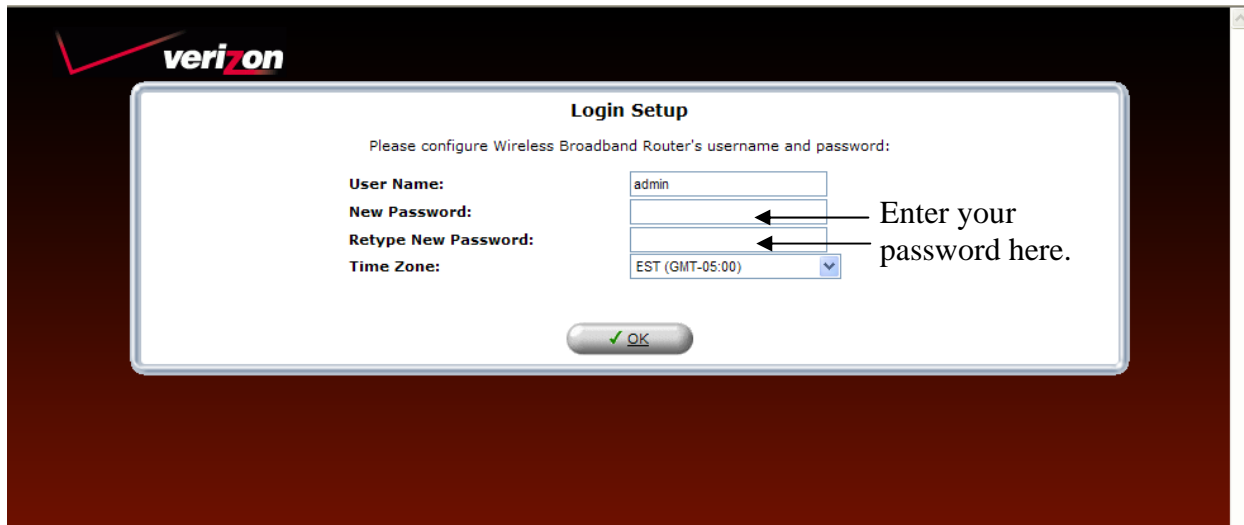
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

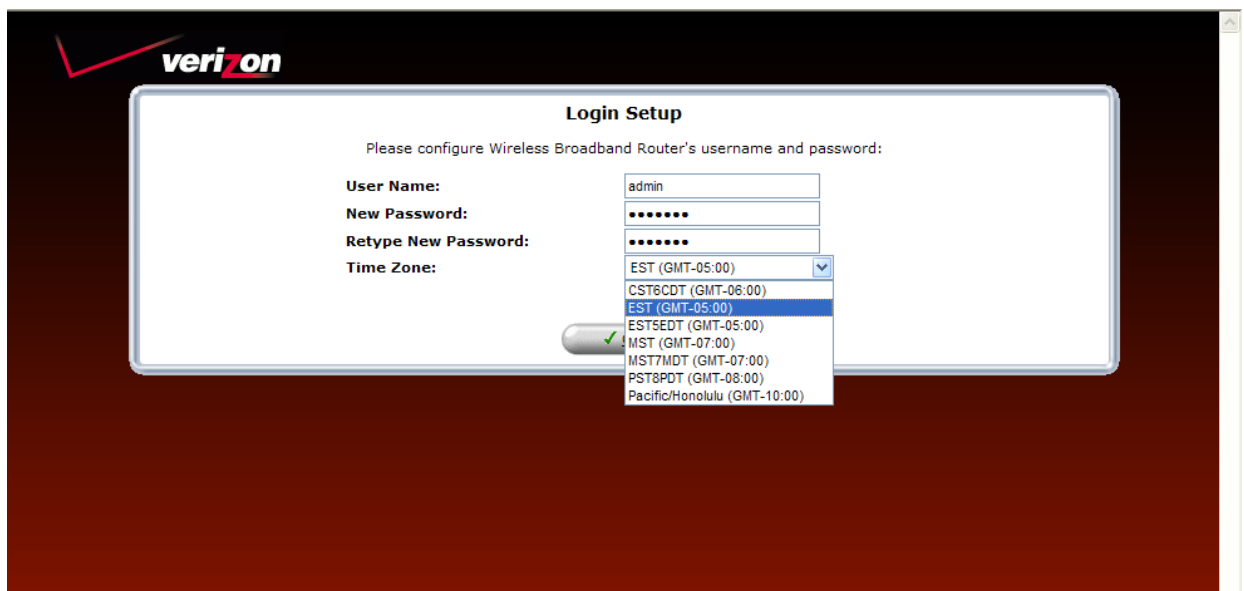
User Guide

By default **admin** appears in the **User Name** field; however, you can change this to the user name of your choice. Type your password in the **New Password** fields. Your password must be 6 or more characters long and contain at least 1 numeral and 1 letter. As you type your password, asterisks will appear for security purposes.

**NOTE:** Please write down your user name and password and save them for future use.



After you have entered your password, select the desired option from the **Time Zone** drop-down menu. Then click **OK** to continue.



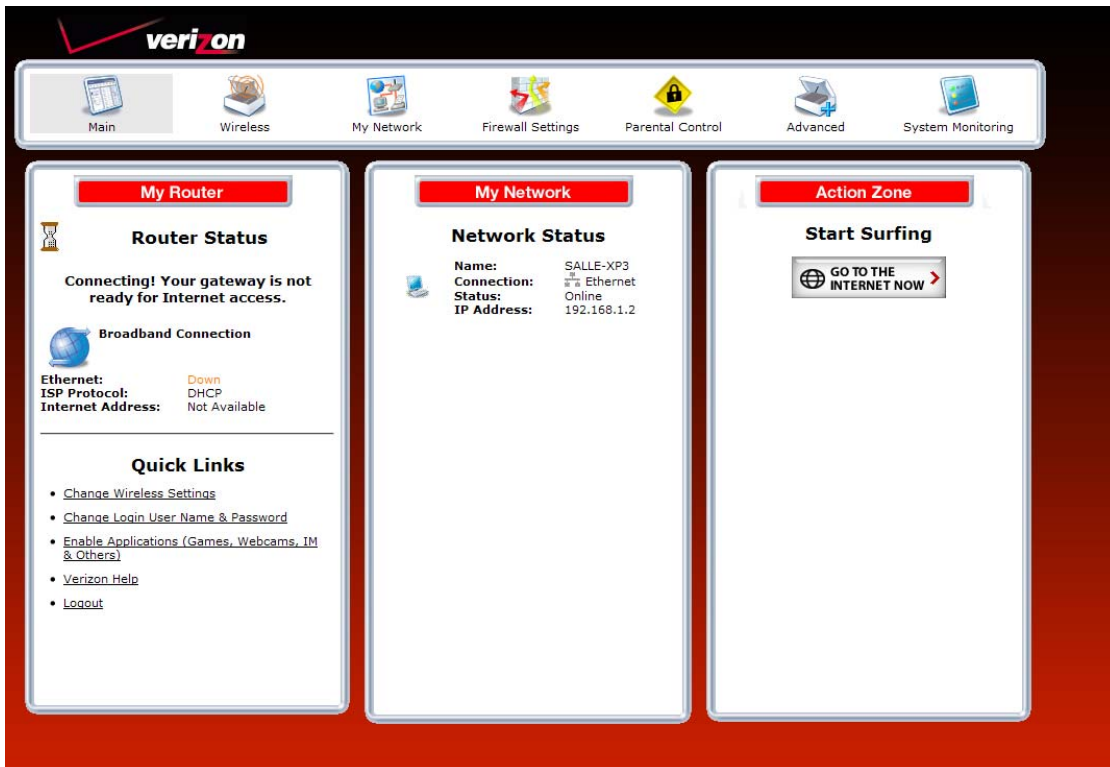


03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

After you have logged on to your Router, the following screen appears. This is the main page of your Router's Web pages, also referred to in this document as the home page. You can access this page by clicking **Main** in the navigation menu located across the top of the Router's Web pages. Details on this page will be explained in the following sections.



Throughout this User Guide, the following icons are used to indicate clicking actions that you can take with your mouse to configure your Router's settings.

Icon	Description
	<b>Edit</b> Clicking this icon allows you to edit the associated entry/setting.
	<b>Add/New</b> Clicking this icon allows you to add a new entry/setting.
	<b>Delete</b> Clicking this icon deletes the associated entry/setting from your Router.
	<b>View</b> Clicking this icon allows you to view or run a diagnostics test on your Router.
	<b>Move Down</b> Clicking this icon allows you to change the order of your list by moving an entry down in the list.
	<b>Move Up</b> Clicking this icon allows you to change the order of your list by moving an entry up in the list.
	<b>What's This</b> Clicking this icon allows you to learn more about a feature.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 7. CONFIGURING YOUR BROADBAND CONNECTION

To browse the Internet using your Router, first confirm your coax link and establish an Internet connection with Verizon. The procedures for configuring your Router for Internet connection are explained in this section.

### 7.1 Confirming Your Coax Connection

**IMPORTANT:** You must have active broadband service before the Router can synchronize with Verizon's equipment and establish an Internet connection.

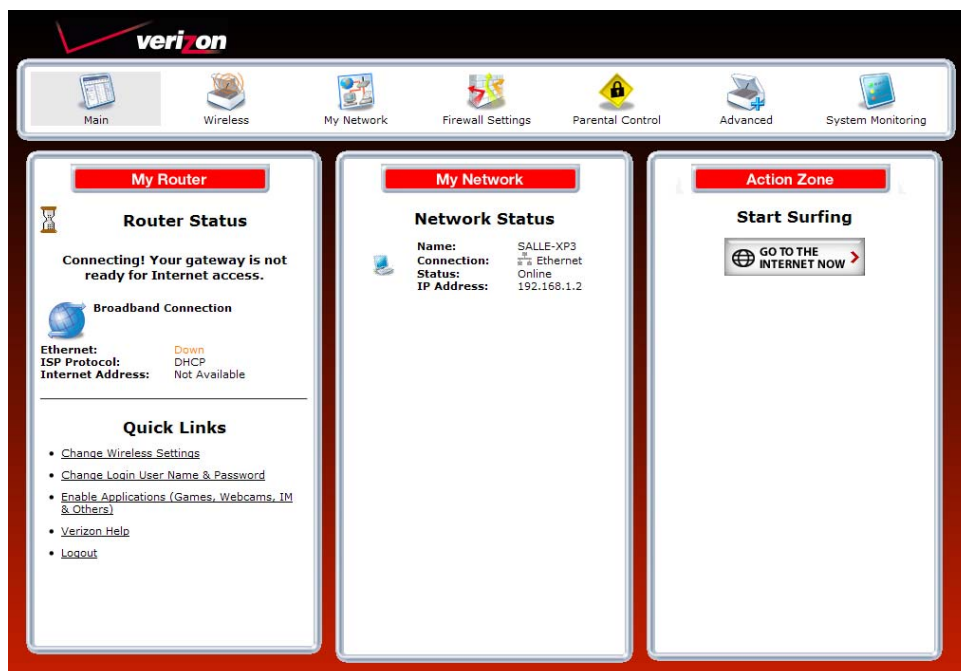
To determine if the Router has established coax link, at the Router's front panel, check to see if the Router's **WAN COAX** LED is solid green or flashing amber— this indicates that a coax link is established.

After confirming your coax link, proceed to section 7.2 to configure your Router's Internet connection settings.

### 7.2 Connecting to the Internet

After you have logged on to the Router, the following home page will appear. Use this page to determine the Router's Internet connection status. If you do not have an Internet connection, the **Internet Address** field will display "Not Available."

To begin your connection setup, at top navigation menu, click **My Network**.



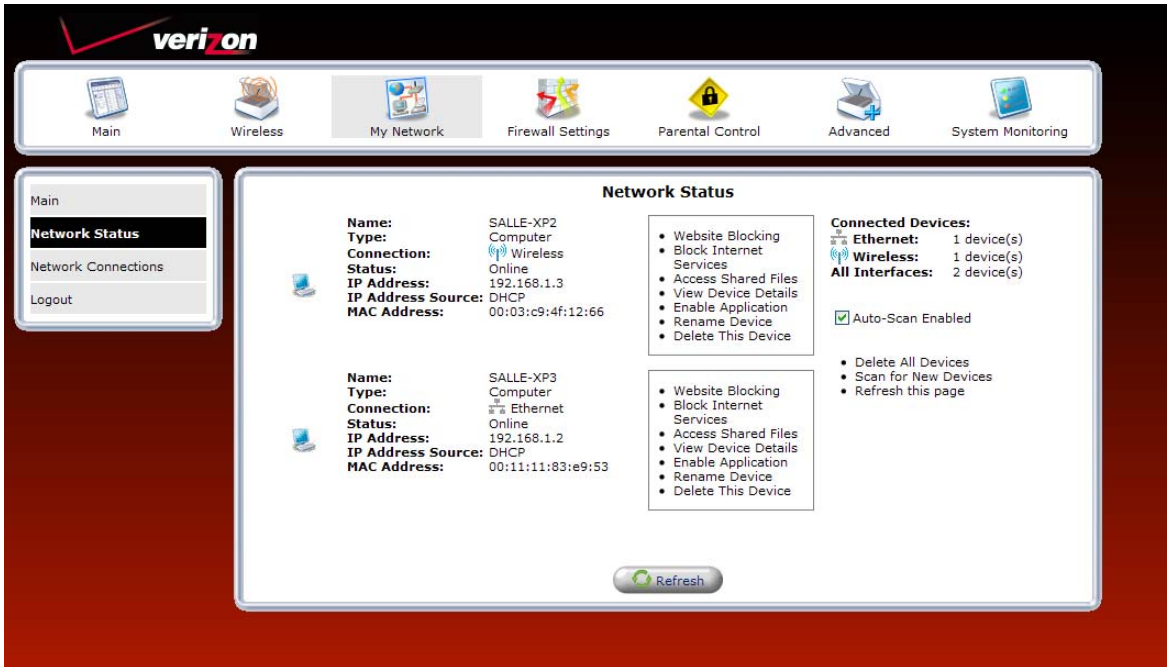


03/24/09 - DRAFT

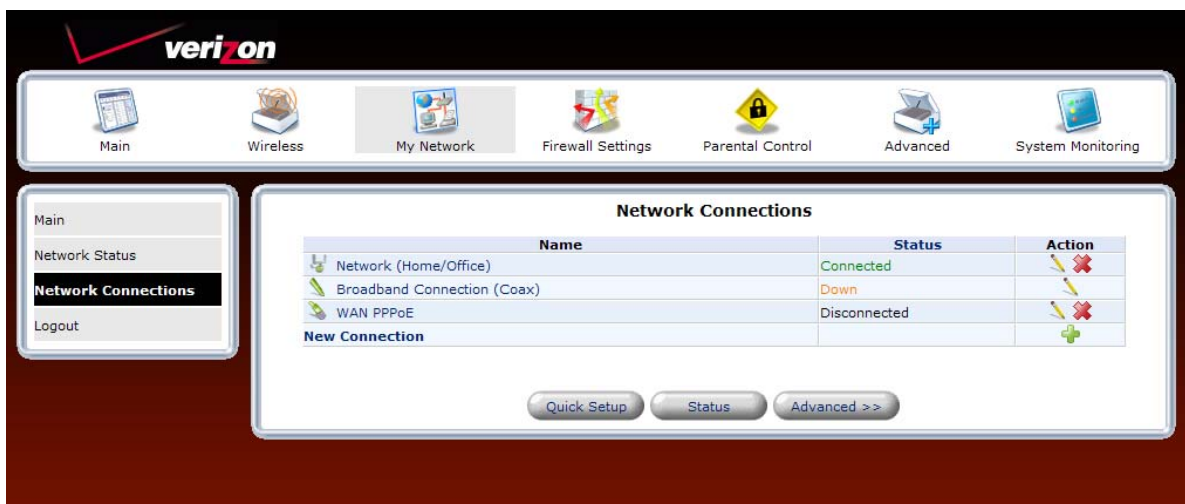
Verizon FiOS Router (Model 9100EM)

User Guide

The **Network Status** page will appear. Next, in the left submenu, click **Network Connections**.



The following screen appears. In the **Network Connections** screen, click the **Quick Setup** button.



The **Quick Setup** page allows you to select the protocol type for your Internet connection, or choose to configure a static IP address. Verizon will inform you of which protocol to use to establish your Internet connection.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 7.2.1 DHCP Protocol Type

**IMPORTANT:** Do not change the settings in the **Quick Setup** screen unless Verizon instructs you to change the settings. Your Router is designed to automatically detect the correct connection type to the network.

If you are using DHCP protocol to connect to the Internet, at the **Quick Setup** screen, do the following:

1. From the **Broadband Detect Default** drop-down menu, select **Automatic IP (DHCP)**. Note: DHCP is the Router's default protocol type. If you use this protocol, you do not need to enter a Login User Name or Login Password.
2. Click **Apply** to save the settings.
3. Click **OK** to continue.

The screenshot shows the Verizon FiOS Router's Quick Setup interface. At the top, there's a navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. A sidebar on the left contains links for Main, Quick Setup, and Logout. The main content area is titled 'Quick Setup' and contains the following fields and options:

- Broadband Connection Device**: WAN Interface: Auto
- Internet Connections**: Broadband Connection Protocol: AUTO DETECTION
- Continuous Auto Protocol detection
- Broadband Detect Default**: Automatic IP (DHCP)
- Current Protocol Type**: Point-to-Point Protocol over Ethernet (PPPoE) WAN PPPoE
- Name**: verizonfios
- Status**: Disconnected - Login Failed
- Login User Name**: verizonfios
- Login Password**: [masked]
- Click Here for Advanced Settings
- Detect Broadband Connection button
- Press the Refresh button to update the status.
- OK, Apply, Cancel, Refresh buttons



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 7.2.2 PPPoE Protocol Type

**IMPORTANT:** Do not change the settings in the **Quick Setup** screen unless Verizon instructs you to change the settings. Your Router is designed to automatically detect the correct connection type to the network.

If you are using PPPoE protocol to connect to the Internet, at the **Quick Setup** screen, do the following:

1. From the **Broadband Detect Default** drop-down menu, select **PPP over Ethernet**.
2. Enter your Login User Name and Password (provided by Verizon) in the fields provided.
3. Click **Apply** to save the settings.
4. Click **OK** to continue.

The screenshot displays the Verizon FiOS Router's Quick Setup interface. At the top, there is a navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. A sidebar on the left contains links for Main, Quick Setup, and Logout. The main content area is titled 'Quick Setup' and contains the following configuration options:

- Broadband Connection Device WAN Interface:** Auto
- Internet Connections Broadband Connection Protocol Protocol Mode:** AUTO DETECTION
- Continuous Auto Protocol detection
- Broadband Detect Default:** PPP over Ethernet
- Current Protocol Type:** Point-to-Point Protocol over Ethernet (PPPoE)
- Name:** WAN PPPoE
- Status:** Connected
- IP Address:** 10.16.90.12
- Default Gateway:** 10.16.90.1
- DNS Server:** 10.16.16.8, 10.16.16.2
- Login User Name:** username@youisp.net
- Login Password:** [Masked]

Below the settings, there is a 'Detect Broadband Connection' button and a note: 'Press the **Refresh** button to update the status.' At the bottom, there are four buttons: OK, Apply, Cancel, and Refresh.





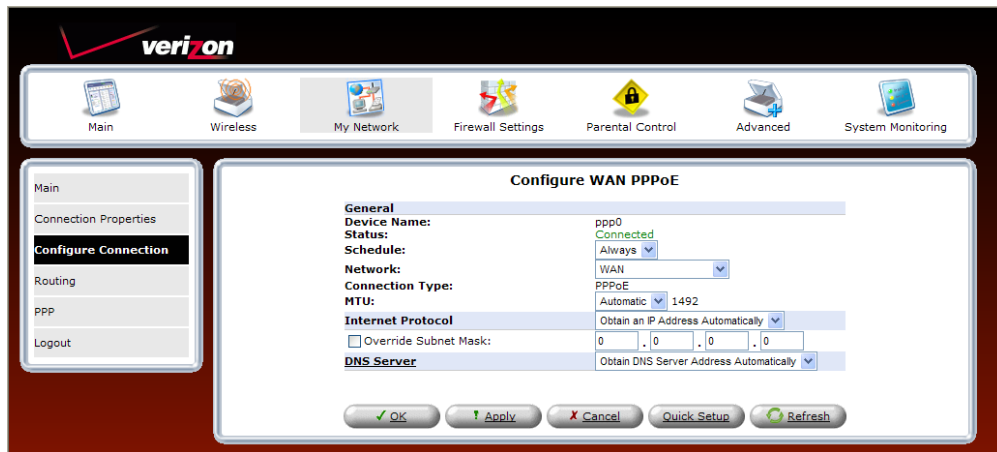
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

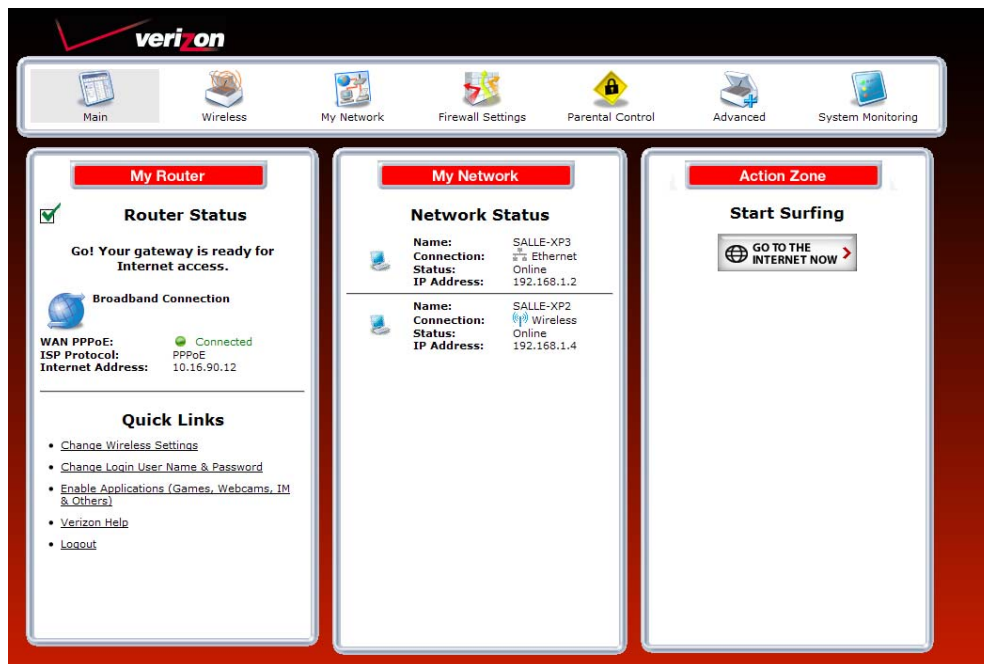
User Guide

To configure additional PPPoE settings, in **Quick Setup** screen, click the link labeled **Click Here for Advanced Settings**. The following screen appears.

**NOTE:** To configure additional WAN PPPoE properties, select **Routing** and **PPP** in the left submenu. If you change any settings in these screens, click **Apply** to save the settings.



After you have selected your protocol and clicked **OK** in the preceding screen, click **Main** to return to the home page. In the **My Router** panel, the message **Go! Your gateway is ready for Internet access** should now be displayed. In addition, the **Internet Address** field will display the WAN IP address of your Router. To quickly access your default Web page, in the **Action Zone** panel, click **GO TO THE INTERNET NOW**.







03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 7.3 Logging Out of the Router's Web Pages

When you are ready to log out of the Router's web pages, click the **Logout** link in the left submenu in any of the Web screens.

**NOTE:** If you want to close the Router's Web page, simply click the "X" in the upper-right corner of the window. Logging out or closing the window does not affect your Internet connection. However, you will need to log in to the Router again when you are ready to access the Router's pages.

The screenshot displays the Verizon FiOS Router web interface. At the top, there is a navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. Below this, the interface is divided into three main sections: 'My Router', 'My Network', and 'Action Zone'. The 'My Router' section includes a 'Router Status' indicator (a green checkmark), a message stating 'Go! Your gateway is ready for Internet access.', and a 'Broadband Connection' status showing 'WAN PPPoE: Connected', 'ISP Protocol: PPPoE', and 'Internet Address: 10.16.90.12'. Below this is a 'Quick Links' section with a list of links: 'Change Wireless Settings', 'Change Login User Name & Password', 'Enable Applications (Games, Webcams, IM & Others)', 'Verizon Help', and 'Logout'. The 'Logout' link is circled in black. The 'My Network' section shows 'Network Status' for two devices: 'SALLE-XP3' (Ethernet, Online, IP 192.168.1.2) and 'SALLE-XP2' (Wireless, Online, IP 192.168.1.4). The 'Action Zone' section features a 'Start Surfing' button with a globe icon and the text 'GO TO THE INTERNET NOW >'. The Verizon logo is visible in the top left corner of the interface.

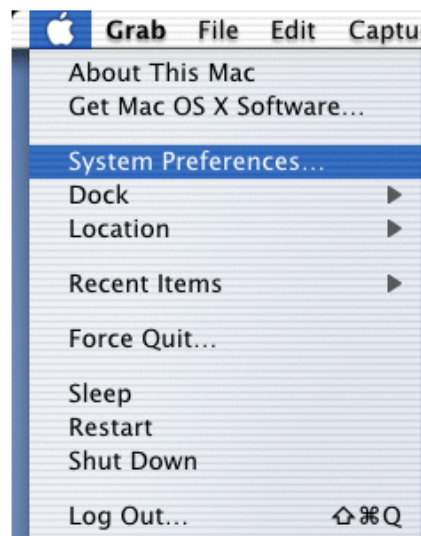
## 8. CONFIGURING YOUR DEVICE FOR DHCP

In order to communicate with your Router, devices on your LAN (such as PCs, laptops and other networking equipment using wired or wireless connection) must have an IP address. Your Router's built-in DHCP server can issue IP addresses to devices on your LAN; however, your device must first be configured to automatically receive an IP address from your Router. Typically, networking devices are shipped from the manufacturer already configured for automatic DHCP, but in instances where you need to configure automatic DHCP, the following sections help explain this setup. If needed, please check your device's user manual for details on configuring your device.

### 8.1 Configuring DHCP in Macintosh OS X

This section provides instructions on how to configure DHCP if you are using Macintosh Operating System 10.

**NOTE:** Macintosh computers must use the Router's Ethernet installation. Refer to section 5 "Installing the Router," for details.



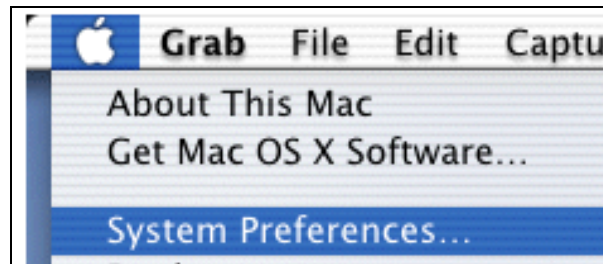
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

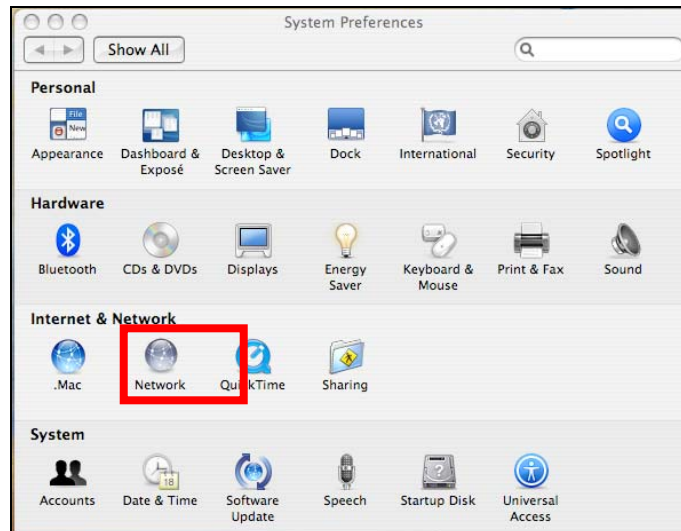
## 8.1.1 Accessing the Preferences Window

After you have connected the Router to the Ethernet port of your Macintosh, the screen below will appear. Click the “Apple” icon in the upper-left corner of the screen and select **System Preferences**.



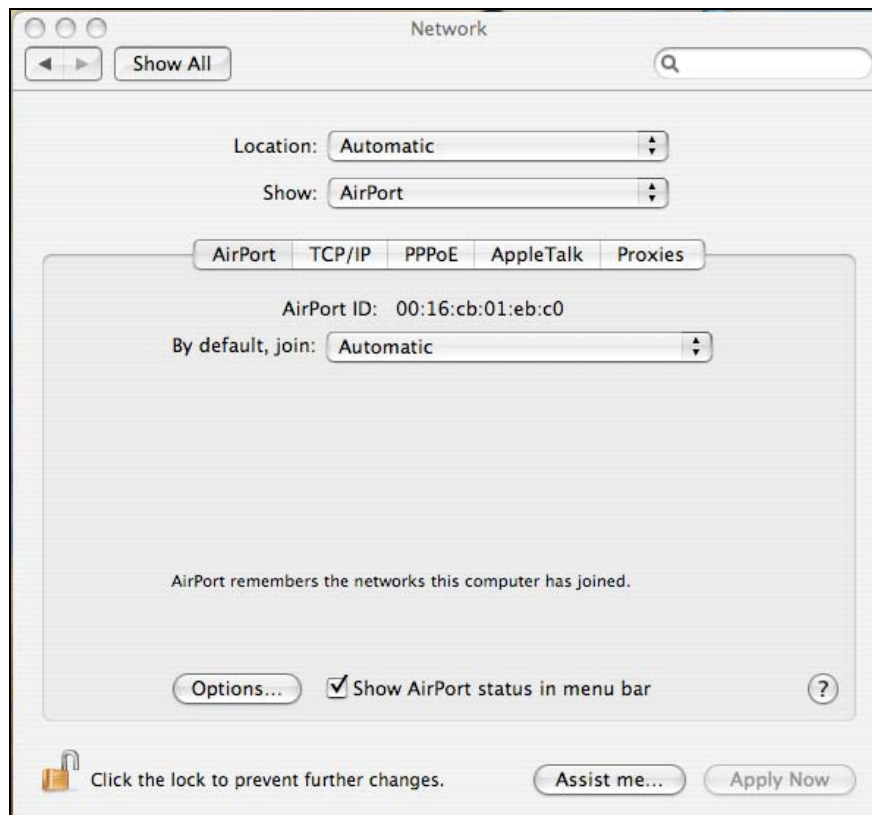
## 8.1.2 Selecting Network Preferences

After selecting **System Preferences** from the previous screen, the following screen appears. Click the **Network** icon.

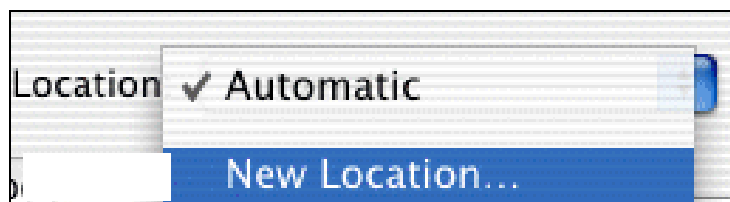


### 8.1.3 Creating a New Location

After clicking the **Network** icon, the **Network** screen will appear.

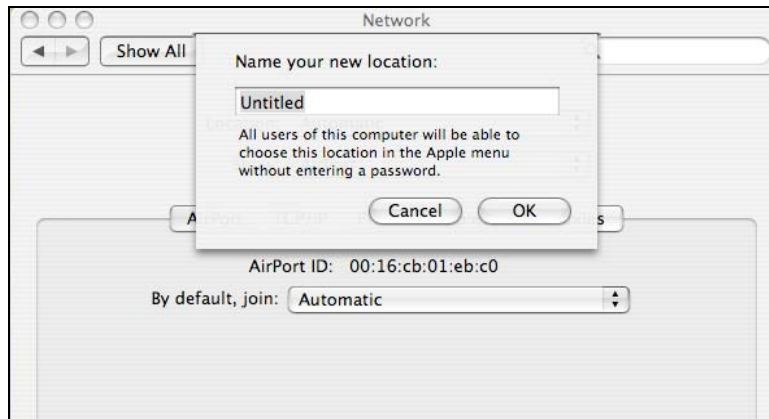


Select **New Location** from the **Location** pull-down menu.

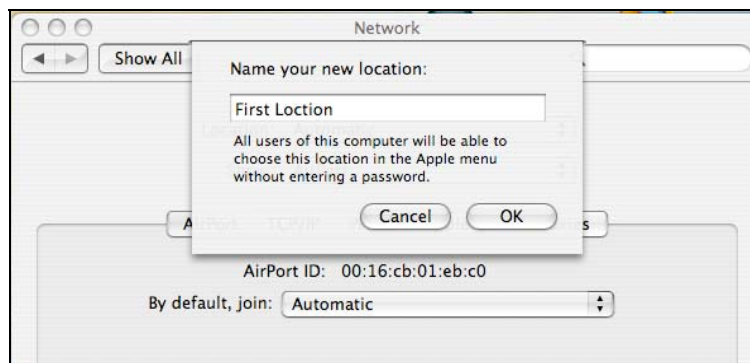


## 8.1.4 Naming the New Location

After you have selected **New Location** in the **Network** screen, the following screen appears. In the field labeled **Name your new location**, enter a location name.



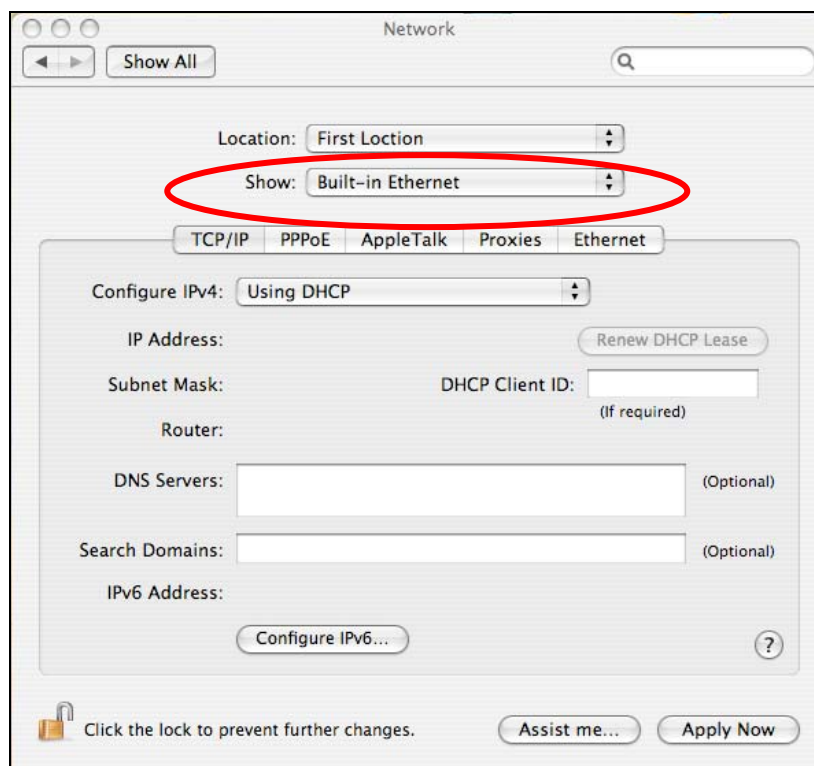
After you have named your new location, click **OK** to continue.



## 8.1.5 Selecting the Ethernet Configuration

After clicking **OK** in the preceding screen, the **Network** screen will appear. The **Network** screen shows the settings for the newly created location. From the **Show** pull-down menu, select **Built-in Ethernet**. In the field labeled **Configure IPv4**, make sure **Using DHCP** is selected. Click **Apply Now** to save the settings.

**NOTE:** Default settings for the Built-in Ethernet configuration are sufficient to operate the Router.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 8.1.6 Checking the IP Connection

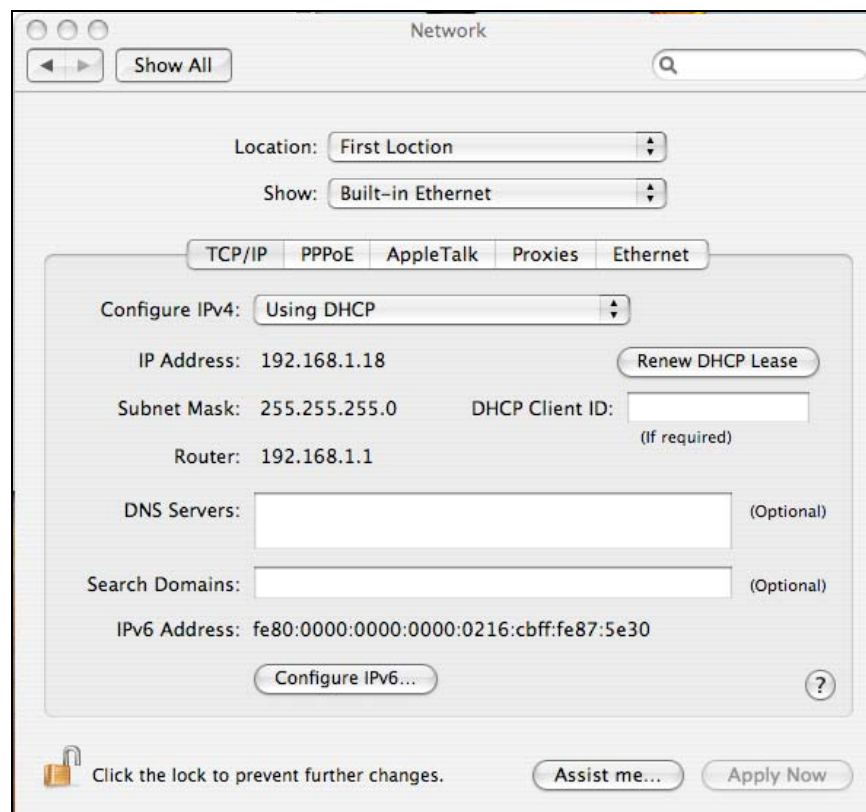
After connecting a computer to your Router, you can confirm that the computer is communicating with the Router by checking to see that the computer has an IP address.

**NOTE:** The Router's DHCP server provides this IP address. If this IP address is not displayed, check the Router's wiring connection to the PC. If necessary, refer to section 5, "Installing the Router," for installation instructions.

To confirm that the connected computer has received an IP address from the Router:

1. Go to the "Apple" icon in the upper-left corner of the screen and select **System Preferences**.
2. In the **System Preferences** screen, click the **Network** icon. The **Network** screen will appear.
3. In the **Show** field in the **Network** screen, select **Built-in Ethernet**.
4. View the **IP address** field. An IP address that begins with **192.168.1** should appear.

This completes the procedure for configuring DHCP in the Macintosh operating system. You are now ready to proceed to section 6.1 of the User Guide for instructions on logging on to your Router.

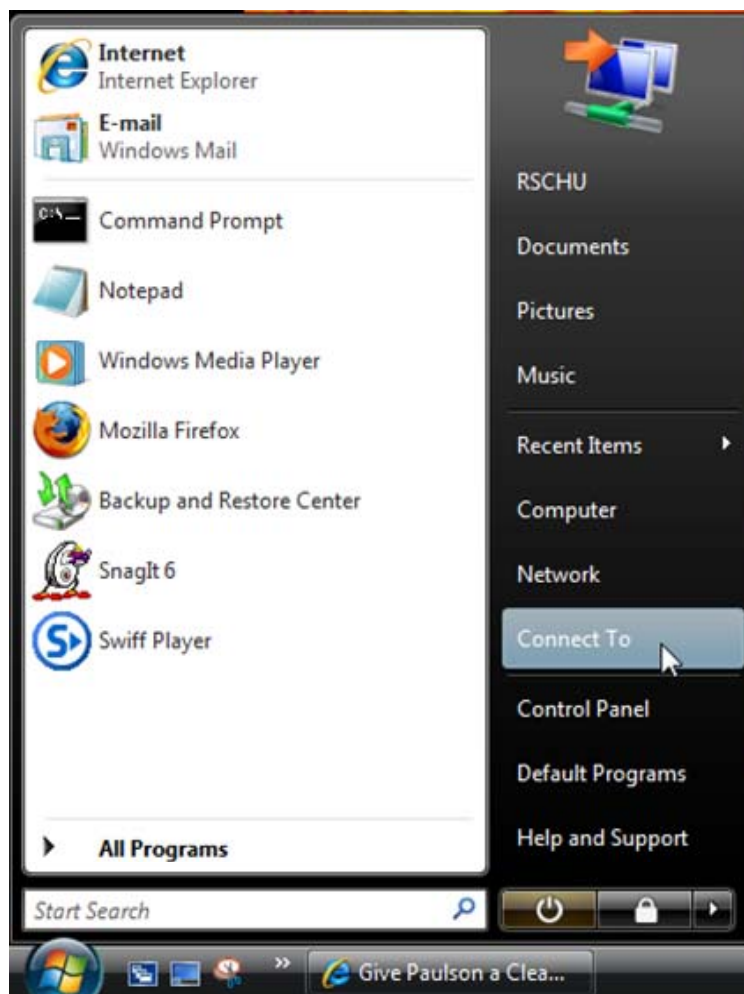


## 8.2 Configuring DHCP in Windows Vista

This section provides instructions on how to configure DHCP if you are using Windows Vista operating system.

### 8.2.1 Accessing Network and Sharing

Begin by clicking **Start** in your system tray and then selecting **Connect To**.



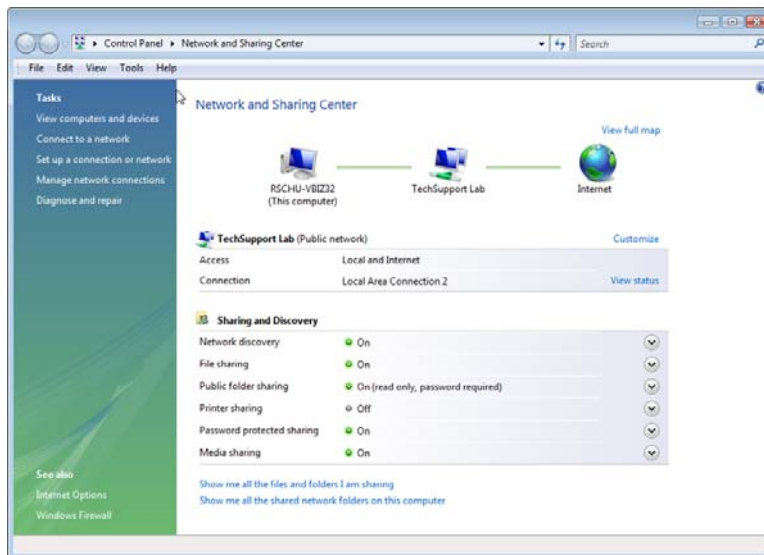


03/24/09 - DRAFT

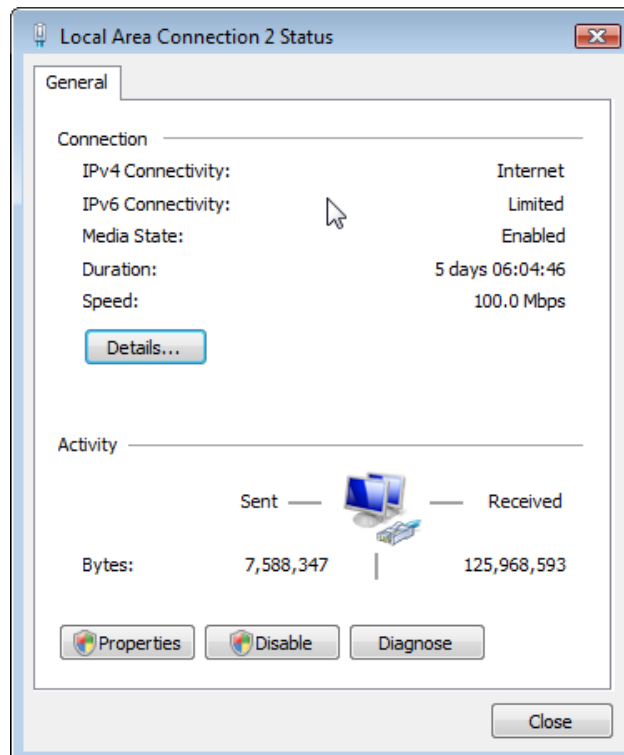
Verizon FiOS Router (Model 9100EM)

User Guide

The following **Network and Sharing Center** window will appear. Click the **View status** link.



## 8.2.2 Configuring Network Connection Properties

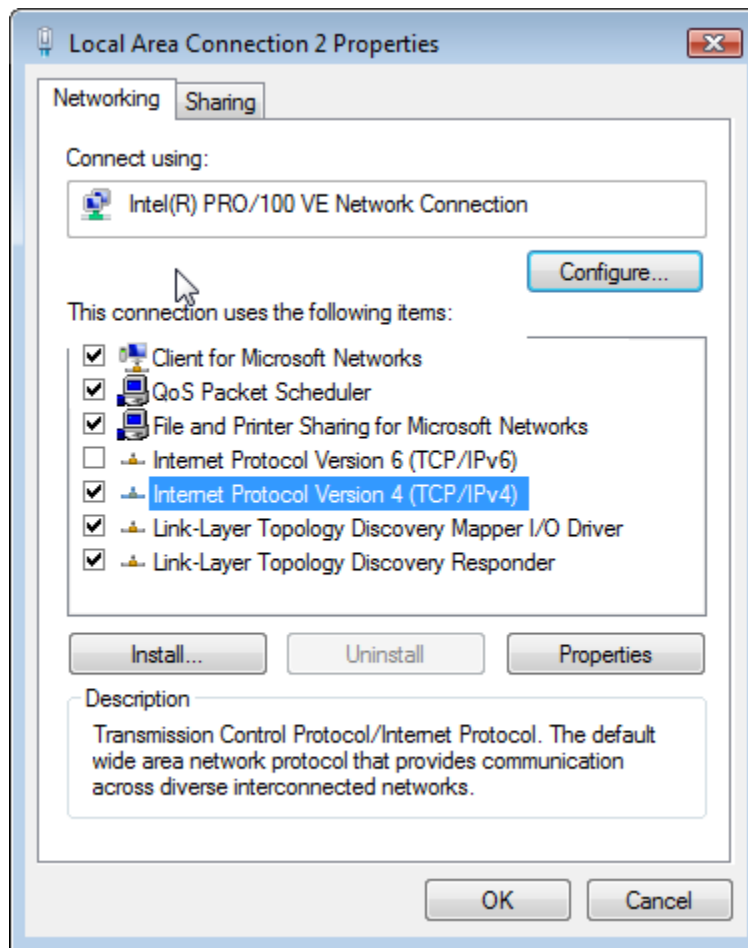


03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

Then, select **Internet Protocol Version 4 (TCP/IPv4)** and confirm that the box displays a check mark. Click the **Properties** button to continue.



03/24/09 - DRAFT

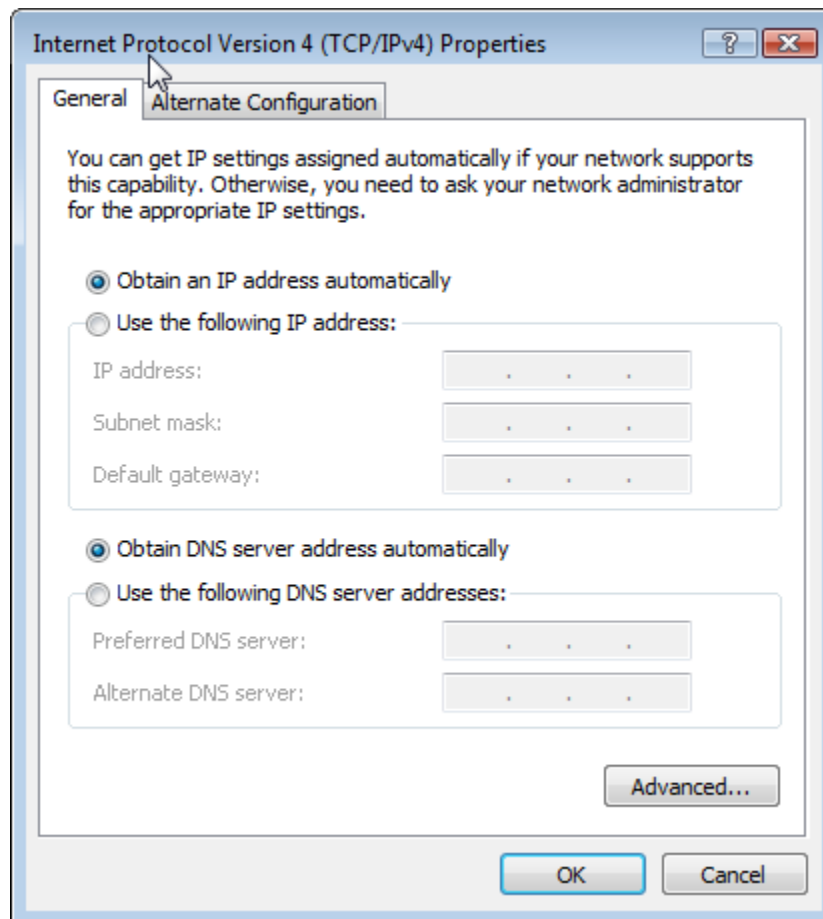
Verizon FiOS Router (Model 9100EM)

User Guide

In the **Internet Protocol Version 4 (TCP/IPv4) Properties** window, complete the following steps:

1. Click the radio button labeled **Obtain an IP address automatically**.
2. Click the radio button labeled **Obtain DNS server address automatically**.
3. Click the **OK** button to save the changes.
4. Click **Close** and then click **Close** again to close the screens.

This completes the procedure for configuring DHCP in the Vista operating system. You are now ready to proceed to section 6.1 of the User Guide for instructions on logging on to your Router.

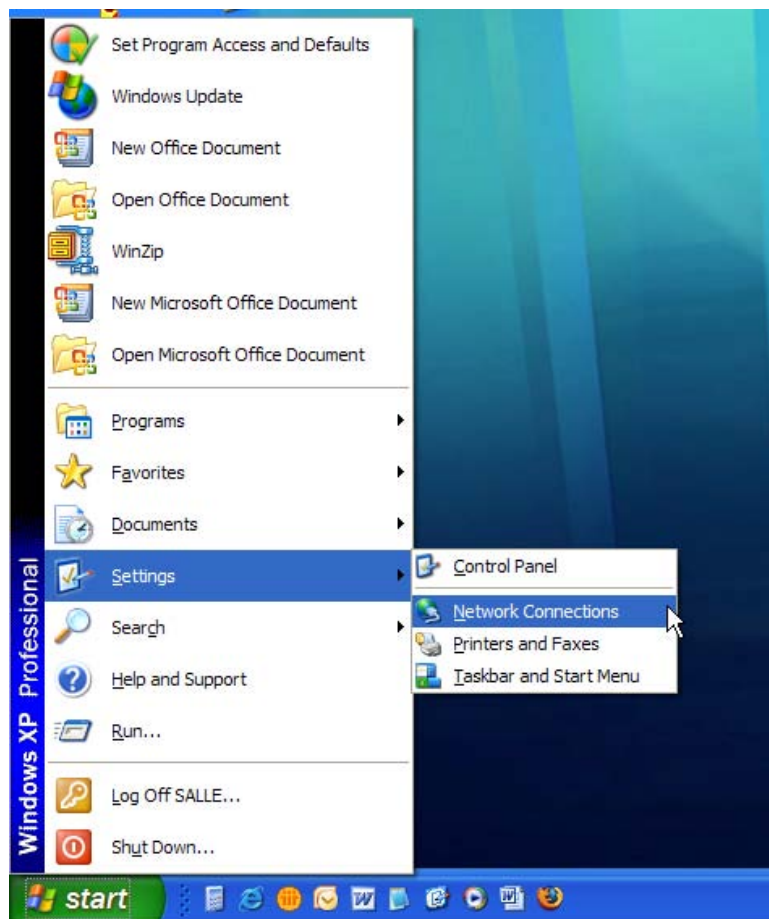


## 8.3 Configuring DHCP in Windows XP

This section provides instructions on how to configure DHCP if you are using Windows XP operating system.

### 8.3.1 Accessing Network Connections

Begin by clicking **Start** in your system tray and then selecting **Settings, Network Connections**.

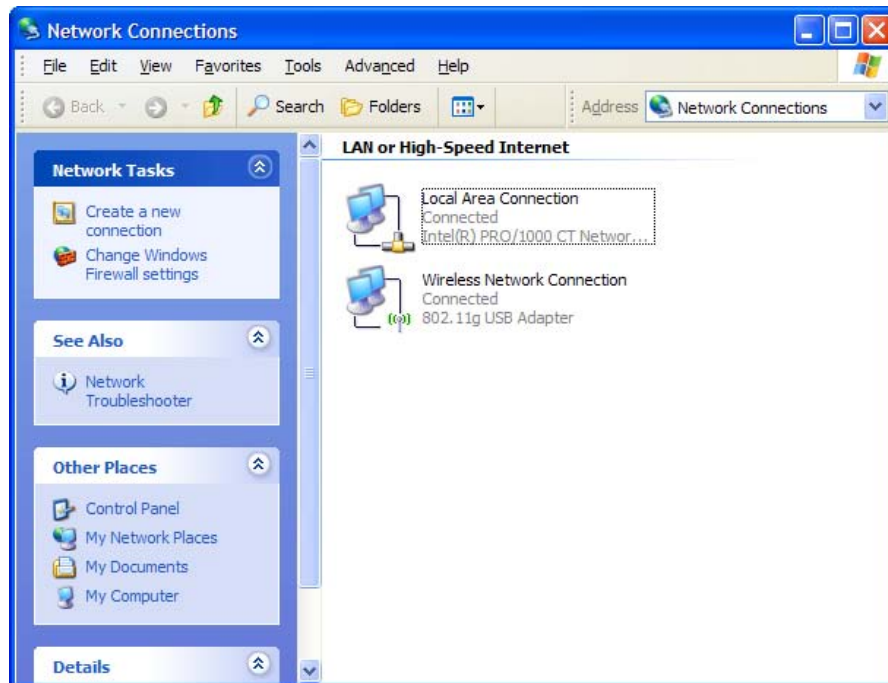


03/24/09 - DRAFT

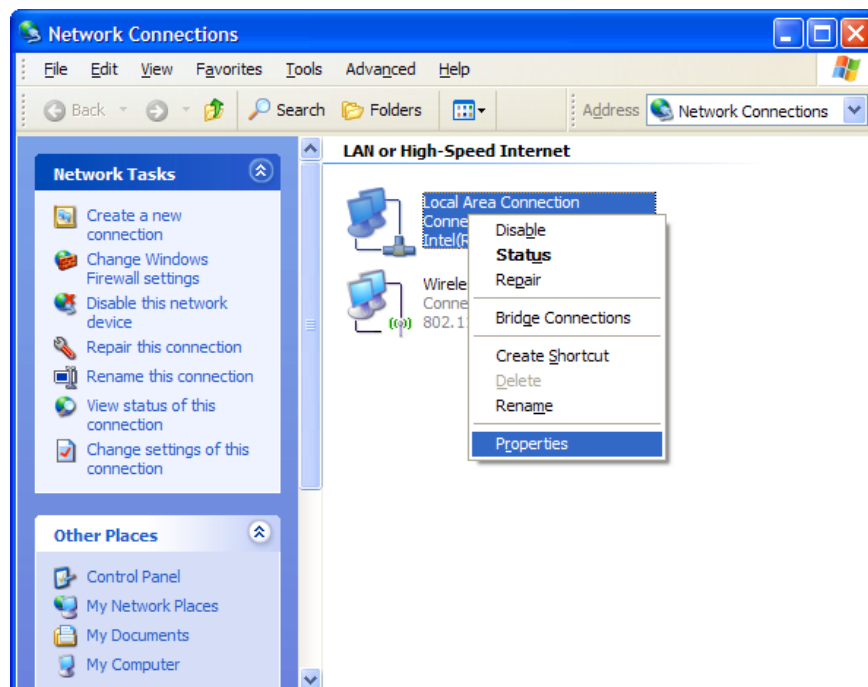
Verizon FiOS Router (Model 9100EM)

User Guide

The following **Network Connections** window will appear.

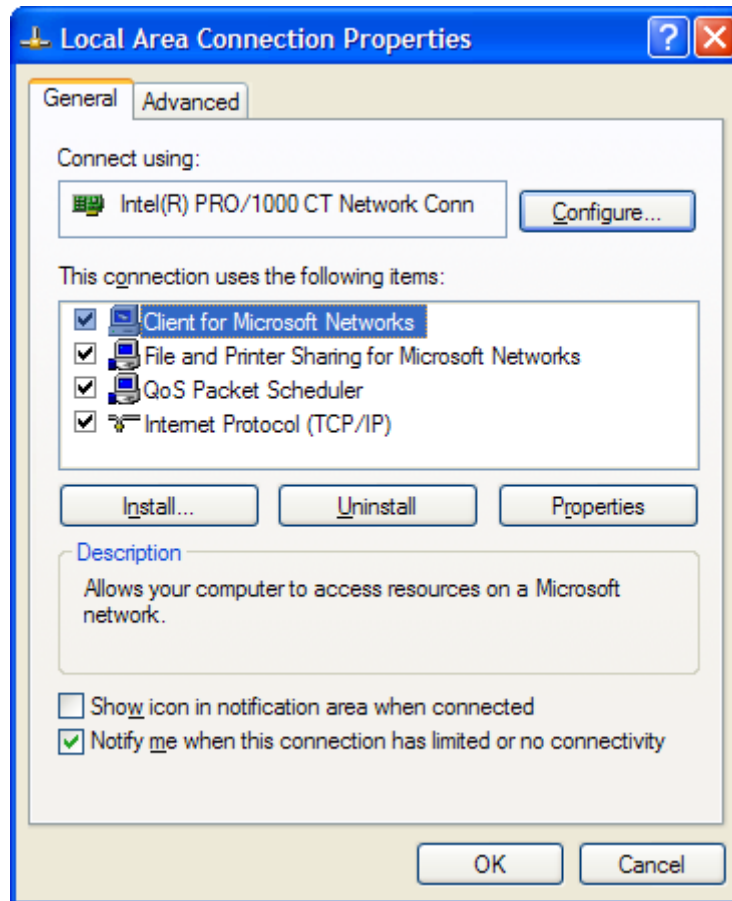


Right-click on **Local Area Connection**, and then select **Properties**.



### 8.3.2 Configuring Network Connection Properties

The following properties window will appear. Click the **General** tab.

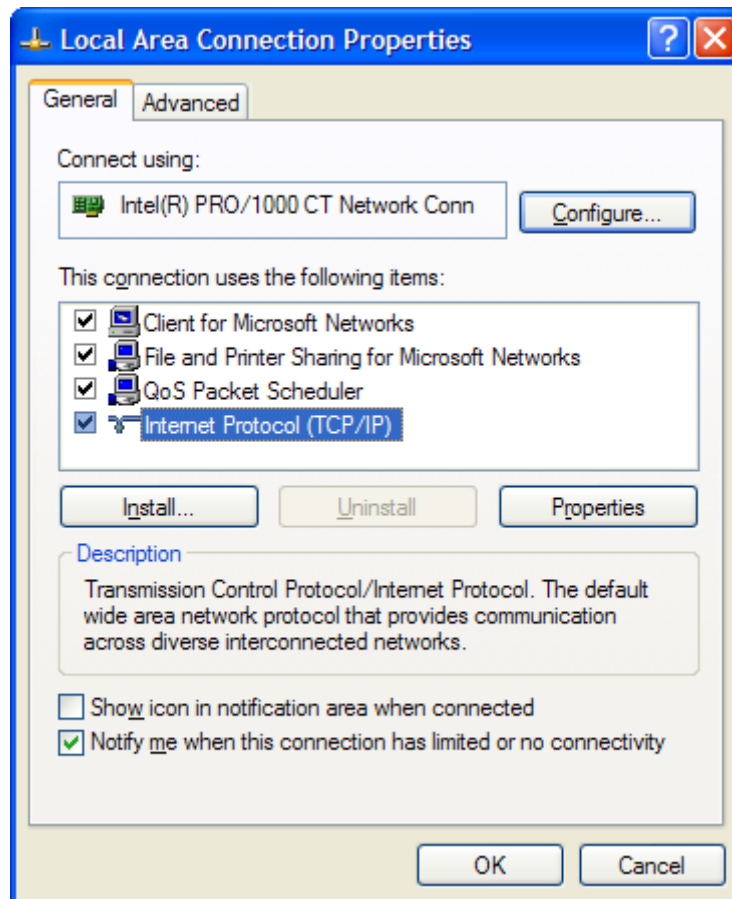


03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

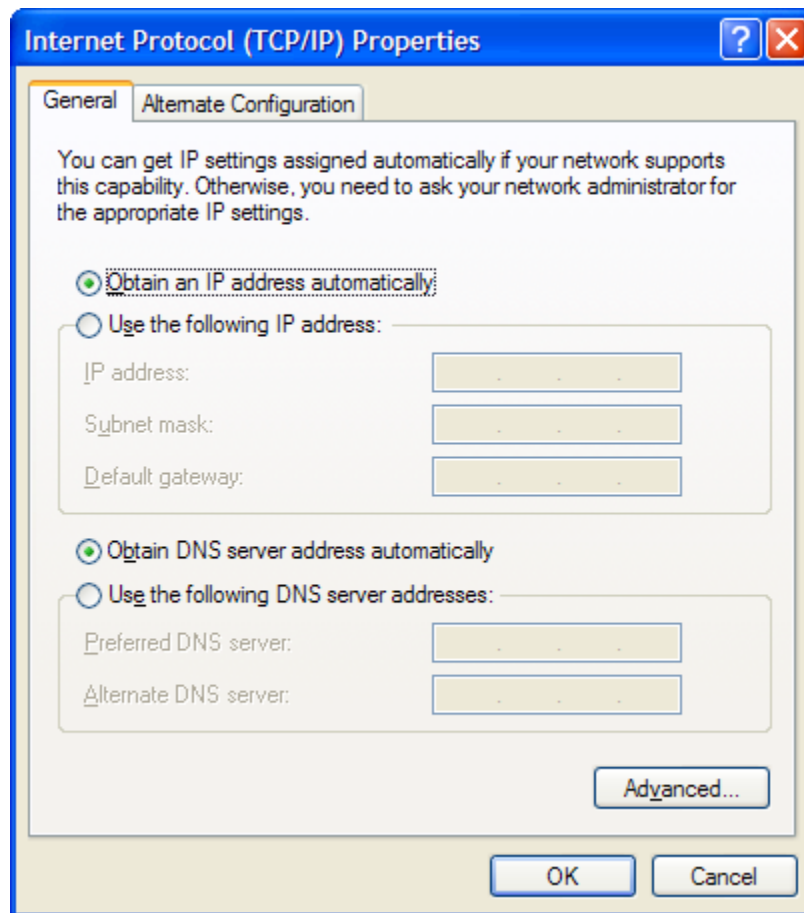
Then, select **Internet Protocol (TCP/IP)** and confirm that the box displays a check mark. Click the **Properties** button to continue.



In the **Internet Protocol (TCP/IP) Properties** window, complete the following steps:

1. Click the radio button labeled **Obtain an IP address automatically**.
2. Click the radio button labeled **Obtain DNS server address automatically**.
3. Click the **OK** button to save the changes.
4. Click **Close** and then click **Close** again to close the screens.

This completes the procedure for configuring DHCP in the Windows XP operating system. You are now ready to proceed to section 6.1 of the User Guide for instructions on logging on to your Router.







03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 9. BASIC CONFIGURATION

**IMPORTANT:** The following sections assume that you have active broadband Internet service.

The Router allows you to make changes to the configurable features such as connection settings, routing configurations, and firewall settings. The following sections explain each feature and show you how to make changes to the Router's settings. The navigation menu displayed at the top of each page allows you to navigate to the various configuration screens of your Router. Whenever you change the settings in your Router, you must click **Apply** to allow the changes to take effect in the Router.

**NOTE:**

1. If you need help, go to the **Quick Links** section in the home page and then click the **Verizon Help** link. Clicking this link takes you to Verizon's Online Help site where you can find additional information about your Router.
2. If you click **OK** or **Apply** in a screen and then experience a delay, you may need to refresh the screen; press the **Refresh** button (where applicable) or press **F5** on your keyboard.
3. If you want to logout of the Router's Web page, click the **logout** link in the home page. Clicking this link does not affect your Internet connection; it only closes the Router's Web page. To log in, you will need to enter your username and password in the **Login** screen.

To configure the basic settings in your Router, follow the instructions provided in sections 10 through 14.



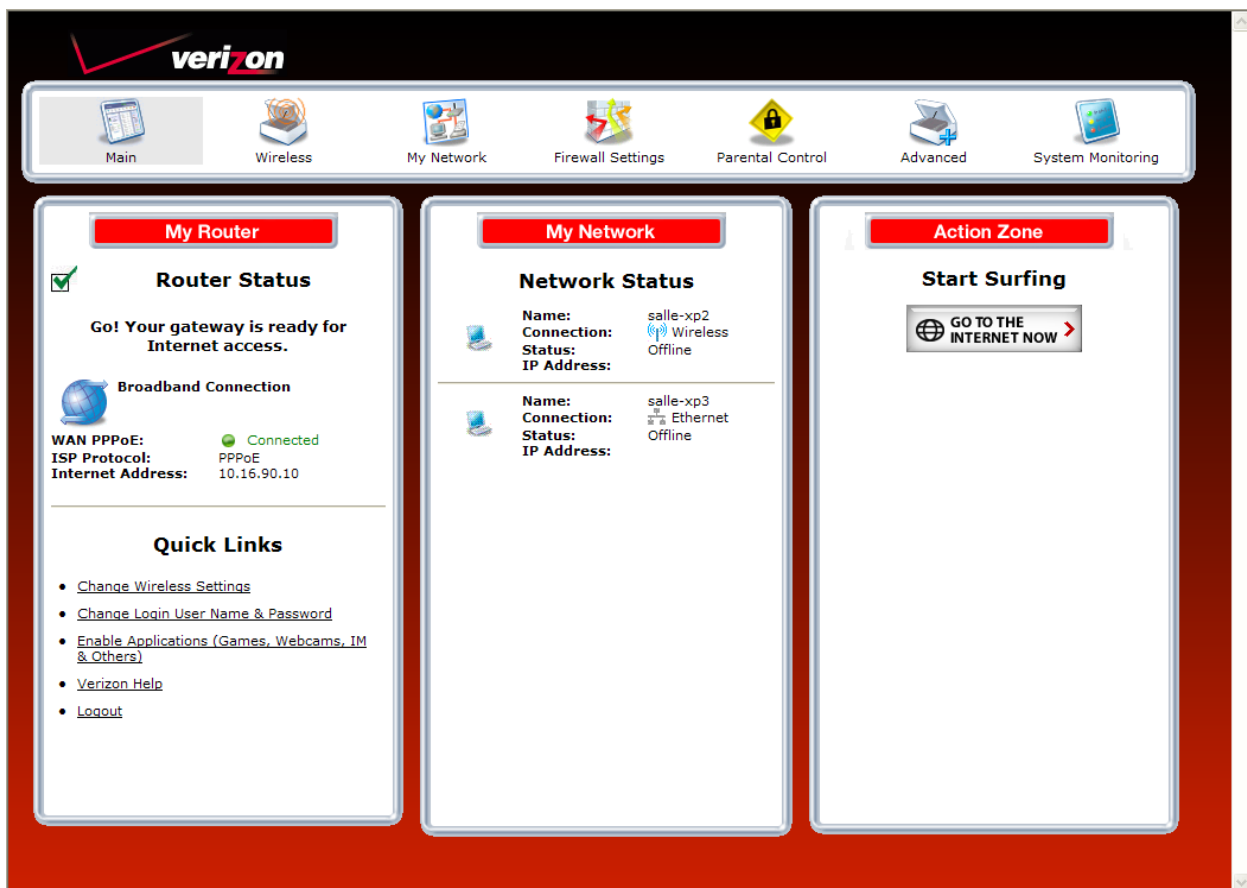
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 10. MAIN (HOME PAGE)

After you have logged on to your Router and established an Internet connection with Verizon, click **Main** in the top navigation menu. The following home page will appear. The home page allows you to view connection information reported by your Router and quickly access Internet services provided by Verizon. The following sections discuss each panel in the Main page. The Main page will be referred to as the home page throughout this User Guide.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 10.1 Router Status

In the home page, the **Router Status** pane allows you to view the status of your Router's Internet connection. Whenever you have an Internet connection, a green check mark is displayed. This signals you to Go! You can now browse the Internet. In addition, the Router's connection type and WAN IP address will also be displayed.

## 10.2 Quick Links

The **Quick Links** pane allows access to your broadband connection settings, and provides a link to Help information related to your Router. The following links are displayed in the **Quick Links** panel.

Quick Links	
Change Wireless Settings	Click this link to access the Router's wireless settings pages.
Change Login User Name & Password	Click this link to change permissions needed to manage network connections, or to set up privileges for new users and groups on your network.
Enable Applications (Games, Web Cams, Instant Messaging, & Others)	Click this link to open a tunnel between remote (Internet) computers and a specific device port inside your local area network (LAN).
Verizon Help	Click this link to access Verizon's Online Help site.
Logout	Click this link to log out of the Router's Web pages.

## 10.3 Network Status

In the home page, the **Network Status** pane allows you to view information about devices that are connected to your network. If your network provides access to shared files, you can access the files by clicking the **Access Shared Files** link. The following details are displayed in the **Network Connections** panel.

Network Status	
Computer Name	The ASCII (text) name or MAC address of the device connected to the network.
Connection Type	The physical or wireless connection used to interface with your Router.
Status	The Internet status of the connected device: Offline or Online.
IP Address	The IP address assigned to a device on your network.

## 10.4 Start Surfing

In the home page, the **Start Surfing** pane allows quick access to Internet services provided by Verizon. Click **GO TO THE INTERNET NOW** to go to your PC's default Web page.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 11. WIRELESS

### 11.1 Wireless Status

If you click **Wireless** in the top navigation menu and then select **Wireless Status** in the left submenu, the following screen appears. This screen allows you to view details about your wireless connection.

**NOTE:** If you change the Router's wireless settings, wireless access to the Router may be interrupted and wireless stations may require reconfiguration.

The screenshot shows the Verizon FiOS Router's web interface. At the top, there is a navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. The 'Wireless' icon is highlighted. Below this is a left-hand menu with options: Main, **Wireless Status**, Basic Security Settings, Advanced Security Settings, Device List, and Logout. The main content area is titled 'Wireless Status' and contains a table with the following information:

Radio Enabled:	YES
SSID:	FX6UM
Channel:	Automatic
Security Enabled:	YES
WEP 64-bit KEY 1 (HEX):	D5D8BBB5C6
WEP 802.1x:	N/A
WPA:	N/A
SSID Broadcast:	Enabled
MAC Authentication:	Disabled
Wireless Mode:	Mixed - accepts 802.11b and 802.11g connections
Packets Sent Total:	6477
Packets Received:	0



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 11.2 Basic Security Settings

If you select **Wireless** from the top navigation menu and then select **Basic Security Settings** in the left submenu, the following screen appears. Your Router also functions as a wireless access point for wireless devices. To configure your wireless settings, enter the appropriate values in the fields provided. Then, click **Apply** to allow the settings to take effect. The following table explains the details of this screen.

### **IMPORTANT:**

1. If you are connecting to the Router via a wireless network adapter, the computer's wireless network adapter must be configured with the Router's Service Set ID (SSID); that is, the SSID used in the wireless network adapter must be identical to the Router's SSID. The default SSID and WEP key for the Router are both located on the right-hand side of the label, which is located on the bottom of the router. Locate and run the utility software provided with the wireless network adapter, and then enter the identical SSID and WEP encryption security settings displayed in the Router into the wireless adapter. For privacy, you can change the SSID and security settings to your desired values. SSIDs are case sensitive and can contain up to 32 alphanumeric characters, including spaces.
2. In order for every computer on your network to connect to your Router wirelessly, confirm that each computer's wireless adapter is using the same security settings that you have configured in the Router's Basic Security Settings screen. After you have configured all the settings in this screen, please record the settings for future reference.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

**Basic Security Settings**

If you want to setup a wireless network, we recommend you do the following:

- 1. Turn Wireless ON.**  
**Wireless:**  ON  OFF
- 2. Change the SSID setting to any name or code you want.**  
(SSID is the same thing as the name of your Wireless Network)  
**SSID:**
- 3. Channel.**  
To change the channel or frequency band at which the Router communicates, please enter it below then click Apply to save your settings.  
**NOTE:** In the United States, use channels 1-11.  
**Channel:**  (FCC)
- 4. Click on the button next to WEP.**  
We recommend using WEP because it encrypts wireless traffic.  
 WEP  OFF  Advanced (WPA/WPA2, 802.1x)
- 5. Select a WEP Key.**  
**NOTE:** To create a WEP Key, you need to enter a combination of 10 digits. You can choose any letter from A-F or any number from 0-9.  
Sample WEP Key: 0FB310FF28  
**Select a WEP Key:**  
  
**Key Code:**  
  
**Number of Digits Left:**
- 6. Write down wireless settings.**  
In order for every computer to connect to this Router wirelessly, you need to make sure that the wireless setup for each computer uses the SAME settings listed below. Please make sure that you write down all of the values set on this screen.

Current Wireless Status	
Wireless:	ON
SSID:	FX6UM
64-BIT WEP:	ON
64-BIT WEP KEY:	D5D8BBB5C6
Channel:	Automatic
SSID Broadcast:	Enabled
MAC Authentication:	Disabled
Wireless Mode:	Mixed - accepts 802.11b and 802.11g connections
Packets Sent Total:	7225
Packets Received:	0



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

<b>Wireless Settings</b>	
Wireless (ON/OFF)	By default, the wireless feature is enabled. To completely turn off the wireless networking feature and the Router's internal wireless radio, select OFF.
Change SSID	The SSID is the name of your wireless network. This string is case-sensitive and must be 30 characters or less. To connect to the Router, the SSID on a computer's wireless card must be identical the SSID on the Router. The Router comes pre-configured with the SSID; however, you can change the SSID to any name or code you want.
Channel	This is the channel of the frequency band at which the Router communicates. The Router transmits and receives data on this channel. The number of channels to choose from is pre-programmed into the Router. A computer's wireless card does not have to be set to the same channel as the Router; the wireless card can scan all channels and look for a Router to connect to. (In the United States, use channels 1 through 11). For better performance, select a channel that is not being used or being used the least by other wireless devices such as cordless phones or other Routers in the area. If "Automatic" is selected, the Router will determine the optimal channel to use.
WEP Security	Factory Default = WEP WEP security encrypts the Router's wireless traffic and prevents unauthorized access to the Router's network. If "Advanced" is selected, it means that current wireless security setting is configured using advanced options (See 'Advanced Security Settings' for additional security options.) Selecting "NO SECURITY" will disable wireless security and is not recommended.
WEP Key Length	A WEP encryption key is used to protect your wireless transmissions. These keys are of varying lengths. The key can include the numbers 0-9 and letters a,b,c,d,e, and f. The number of characters must be either 10 (for 64/40 bit encryption) or 26 (for 104 bit encryption). If this page is used to configure WEP, key 1 will be used as the active key. You should note this value as you will have to enter it into each device which is connecting wirelessly
WEP Key	This is the actual security key value. You should note this value as you will have to enter it into each device which is connecting wirelessly.
Number of Required Digits	This field indicates how many more characters are needed to complete the security key. The security key is not complete unless this counter indicates 0.
Current Wireless Status– Configure Wireless Client Settings to match Router's settings	For wireless clients, such as computers and other devices with wireless cards to establish a wireless connection to this Router, the clients' settings, especially the SSID, channel, wireless mode, and security (i.e., WEP) settings must match the Router's settings as summarized in the table. If channel is set to Automatic, the Router will determine the optimal channel to use. (If settings, particularly if using advance security options, are changed in other or "Advanced" sections, the sections where the changes were made must be consulted for reference.)



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 11.3 Advanced Security Settings

If you select **Wireless** from the top navigation menu and then select **Advanced Security Settings** in the left submenu, the following screen appears. Generally, most owners of the Router will not need to modify these wireless options.

From this menu, you can change your wireless security level by selecting the desired choice: WEP, WEP + 802.1x, or Wireless Protected Access (WPA). You can also enable/disable the SSID broadcast feature for the product. If you want to limit connected wireless devices to only the 802.11g (54 Mbps) standard, choose the 802.11 b/g mode link and select the desired mode.

To access additional security settings, in the **Advanced Security Settings** screen click any of the following links:

- SSID Broadcast
- Wireless MAC Authentication
- 802.11b/g Mode
- Other Advanced Wireless Options

The following sections provide details about each link.

**Advanced Security Settings**

**IMPORTANT:** Only the advanced, more technical user should use this page.

Please select the item that you want to adjust the settings for, then select the **Next** button below.

**Level 1: Securing your wireless traffic as it transmits through the air.**  
Click on an option to modify its settings.

- WEP** (Recommended)
- WEP + 802.1x** (For enterprise networks only)
- WPA** (Allows you to enable a pre-shared key for a home network or more advanced security for an enterprise network)

**Level 2: Stop your Router from broadcasting your Wireless Network Name (SSID).**  
**SSID Broadcast** (Allows you to prevent users who do not know your SSID name to access your Router wirelessly.)

**Level 3: Limit access to certain wireless devices**

**Wireless MAC Authentication** (Allows you to limit access to your wireless network by allowing or denying devices with specific MAC addresses.)

**802.11b/g Mode** (Allows you to limit access to your wireless network based on the type of technology.)

**Other Advanced Wireless Options**





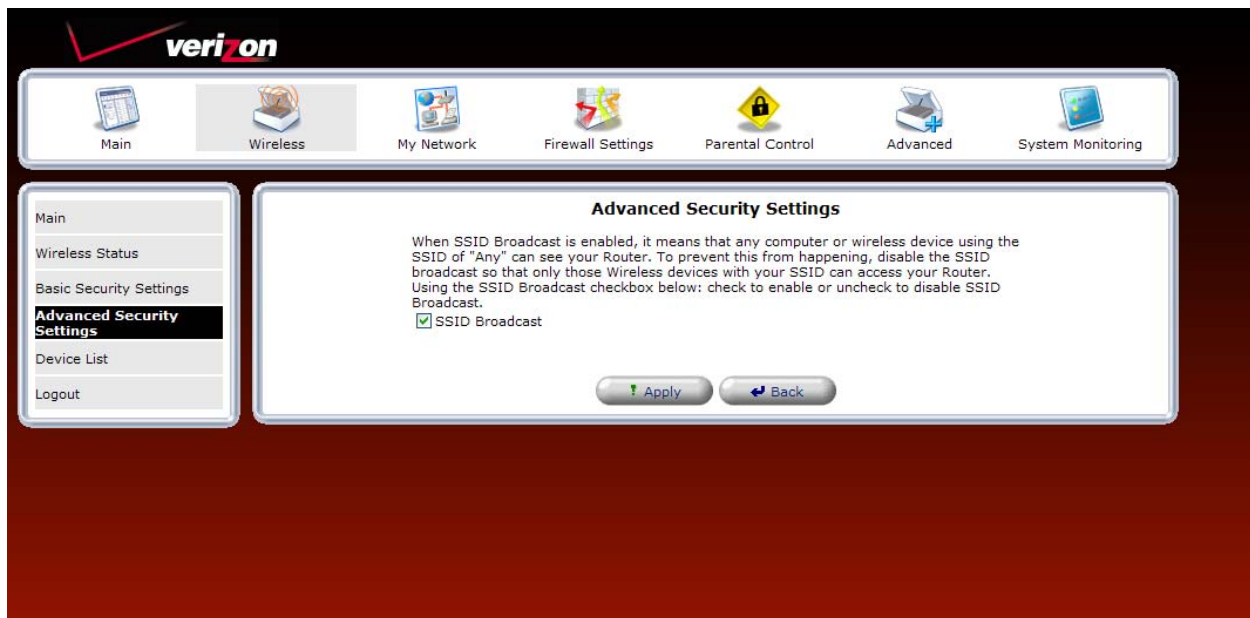
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

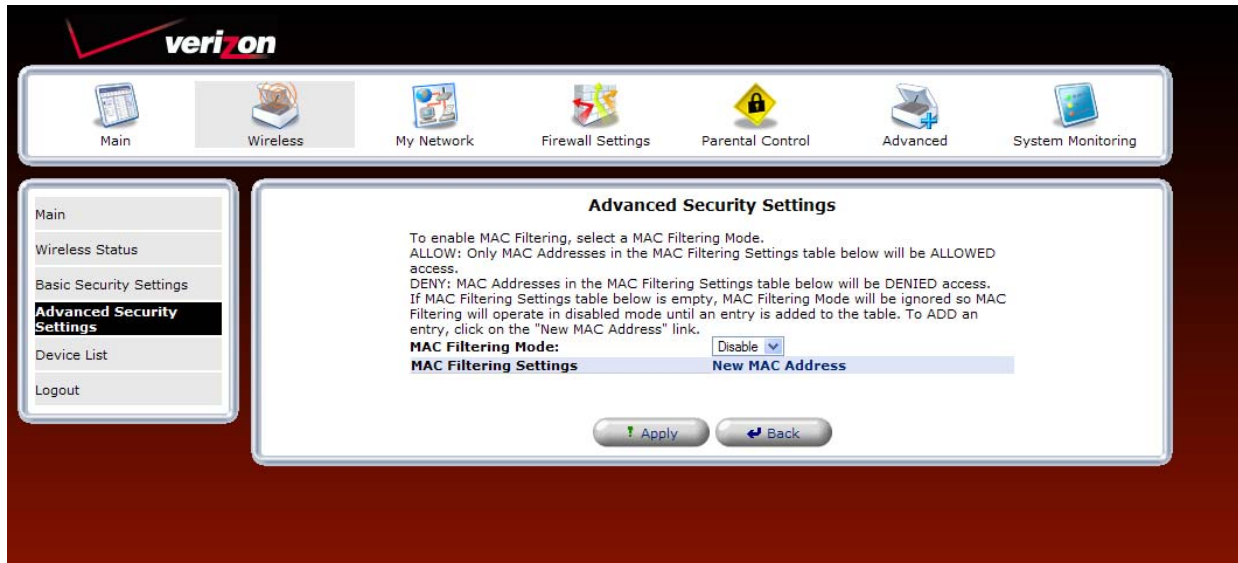
### 11.3.1 SSID Broadcast

If you clicked the **SSID Broadcast** link in the **Advanced Security Settings** screen, the following screen appears. By disabling the SSID broadcast, your Router will no longer send out messages indicating that it is in place. Disabling the SSID broadcast does not disable the wireless interface and clients configured with the correct SSID and wireless security key (when enabled) will still be able to connect. If you enable or disable SSID Broadcast, you must click **Apply** to save the change.

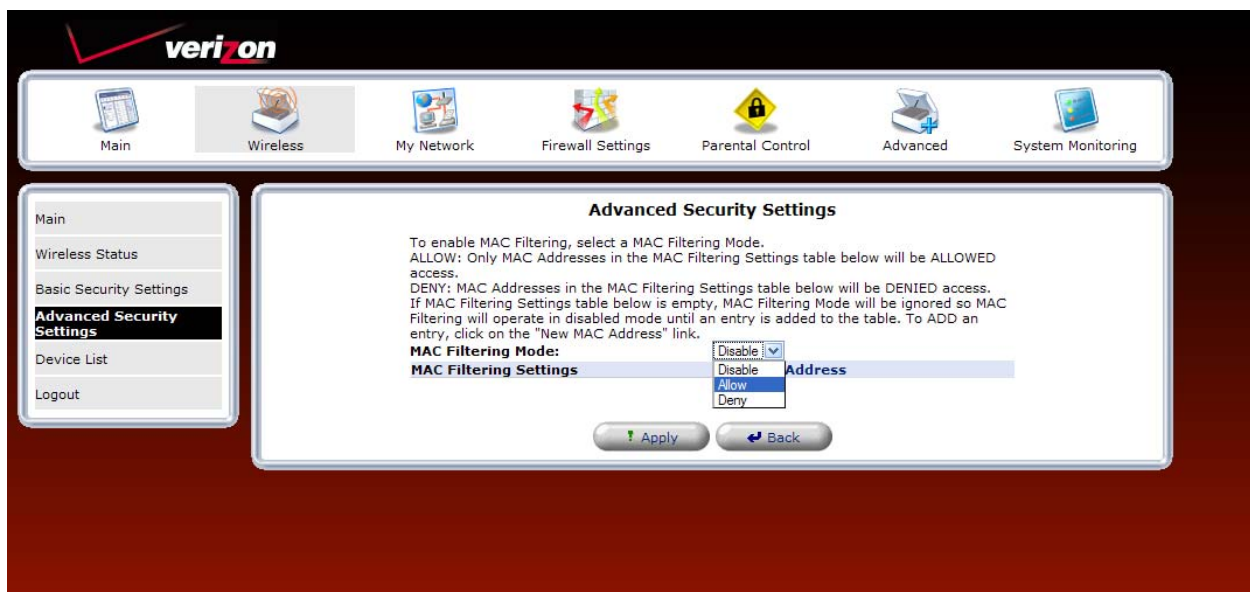


### 11.3.2 Wireless MAC Authentication

If you clicked the **Wireless MAC Authentication** link in the **Advanced Security Settings** screen, the following screen appears. Set up your MAC Filtering settings, and then click **Apply** to save the settings.



For example, if you select “Allow” from the **MAC filtering Mode** drop-down list, this option will allow only the devices whose MAC Addresses are active in the list to connect to the Router. To add a MAC address, click the **New MAC Address** link.



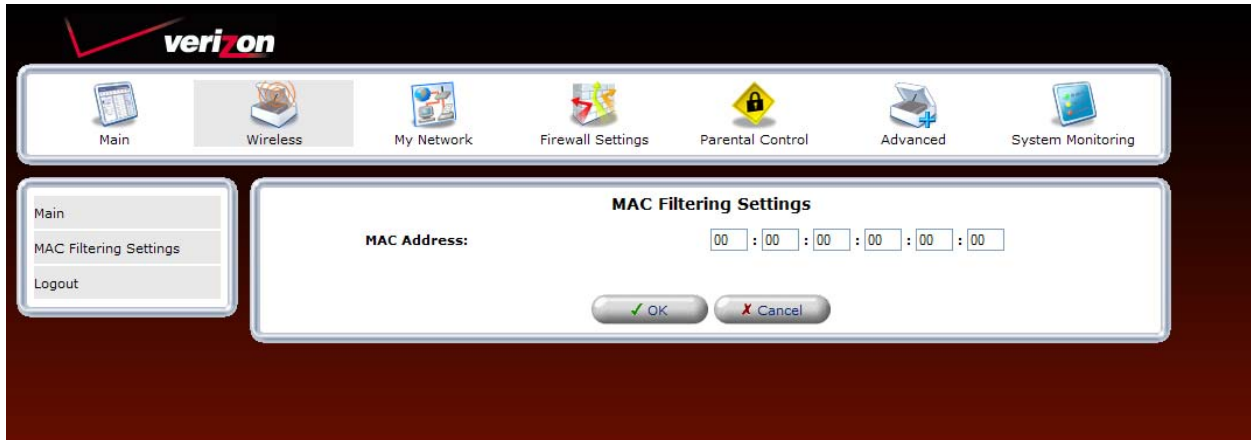


03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

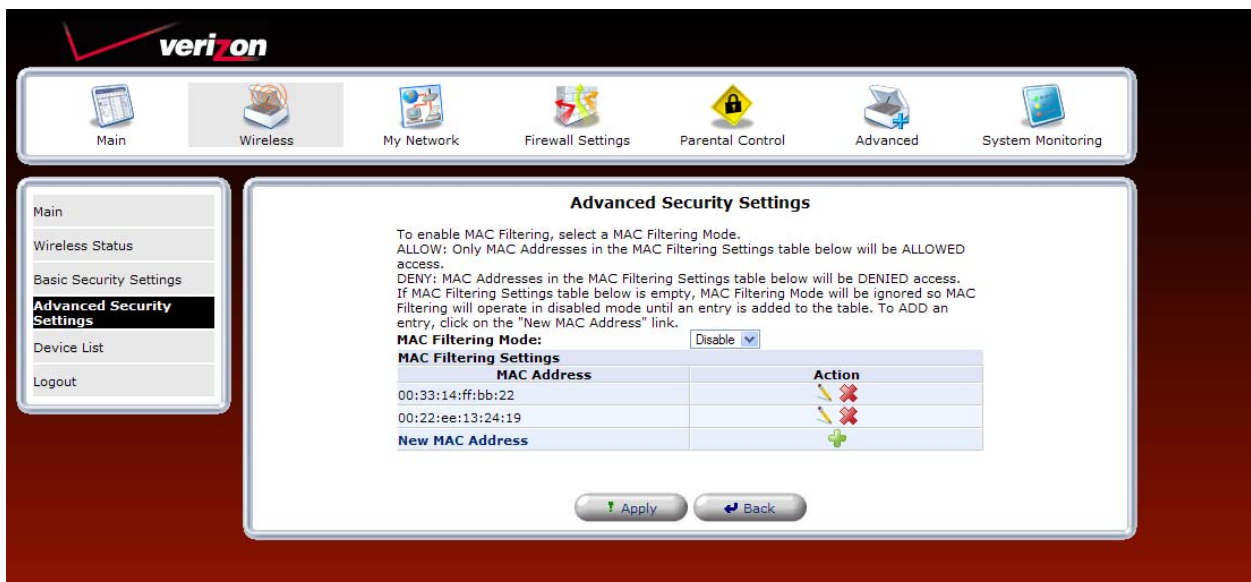
User Guide

The following screen appears. Enter the MAC address of the device that you want to allow access to the Router. Then, click **OK** to continue.



After you have entered a valid MAC address, the following **Advanced Security Settings** screen will display all the MAC addresses that have been added to the MAC filtering table. Be sure to select the desired option from the **MAC Filtering Mode** drop-down list. Then, click **Apply** to allow the settings to take effect in the Router.

To edit a MAC address, click the pencil icon next to the address you want to edit. To delete a MAC Address, click the "X" icon next to the address you want to delete. To add a new MAC address, click the plus icon, or click the **New MAC Address** link.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

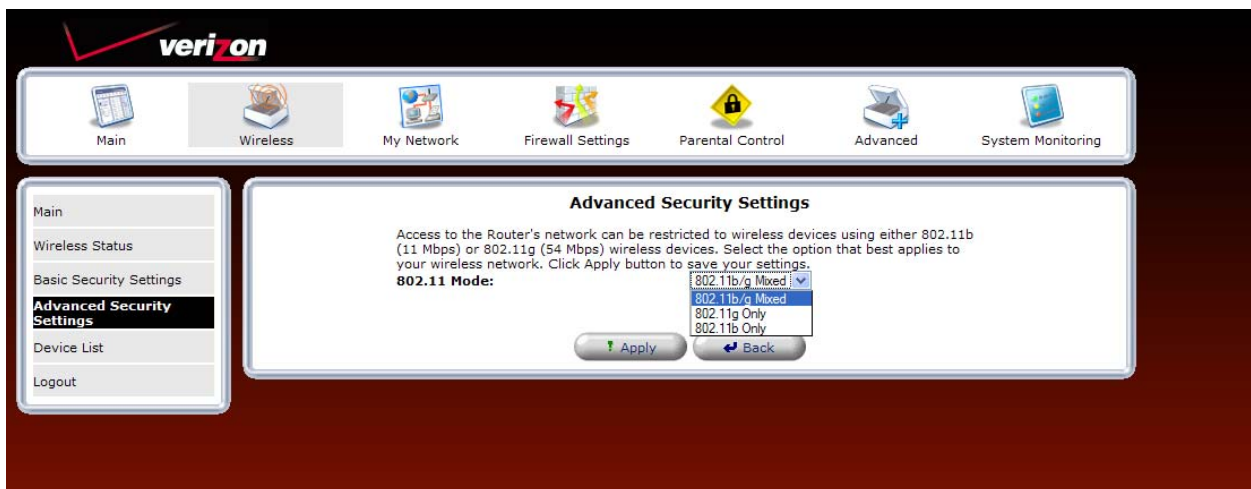
User Guide

### 11.3.3 802.11b/g Mode

If you clicked the **802.11b/g Mode** link in the **Advanced Security Settings** screen, the following screen appears. Access to the Router's wireless network can be controlled by designating a wireless LAN technology specification 802.11b (11 Mbps) or 802.11g (54 Mbps). Use an option that is most compatible with your wireless clients.



Select the desired mode from the drop-down list, and then click **Apply** to save the settings.





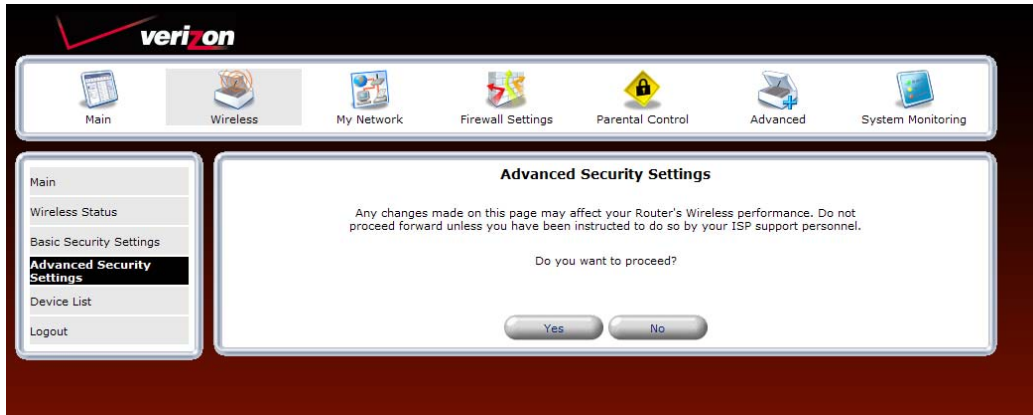
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

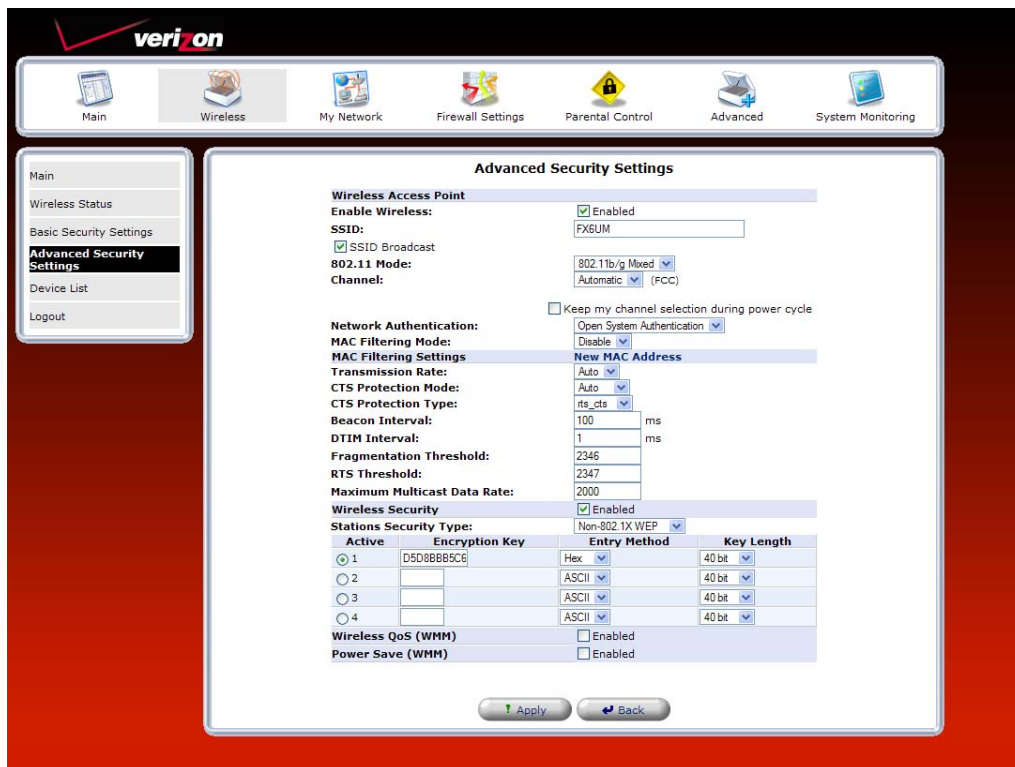
User Guide

### 11.3.4 Other Advanced Wireless Options

If you clicked the **Other Advanced Wireless Options** link in the **Advanced Security Settings** screen, the following screen appears. Click **Yes** to proceed.



This screen provides full access to all wireless and security settings on one page. Enter the desired values, and then click **Apply** to save the settings. The following table explains the details of this screen.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

<b>Advanced Security Settings</b>	
Wireless Access Point	The Router also functions as a wireless access point for wireless devices.
Enable Wireless	By default, the wireless feature is enabled. To disable this feature, clear the check box.
SSID	The SSID is the name of your wireless network. This string is case-sensitive and must be 30 characters or less. To connect to the Router, the SSID on a computer's wireless card must be identical the SSID on the Router. The Router comes pre-configured with the SSID; however, you can change the SSID to any name or code you want.
SSID Broadcast	Select this check box to enable SSID (a check mark will appear in the box). When this box is cleared, the Router will not broadcast its SSID. When SSID Broadcast is enabled, any computer or wireless device using the SSID of "ANY" can see the Router. To prevent this from happening, click the <b>Disable</b> option button. This will disable SSID Broadcast so that only the wireless devices that are configured with your SSID can access your Router.
802.11 Mode	Allows you to limit access to your Router based on technology type. 11b only: Communication with the Router is limited to 802.11b 11g only: Communication with the Router is limited to 802.11g 802.11 b/g Mixed: Computers using 802.11b or 802.11g rates can communicate with the Router.
Channel	This is the channel of the frequency band at which the Router communicates. The Router transmits and receives data on this channel. The number of channels to choose from is pre-programmed into the Router. A computer's wireless card does not have to be set to the same channel as the Router; the wireless card can scan all channels and look for a Router to connect to. (In the United States, use channels 1 through 11).
Network Authentication	Open System Authentication: If Open System authentication is selected, this will allow any station to associate with the wireless network, but only stations with a valid WEP key can send or receive data from the Router. Shared Key Authentication: If Shared Key Authentication is selected, a station must authenticate with the Router (using the WEP key) before it can connect to the Router's wireless network. Both: If "Both" is selected, the Router will allow both Open System and Shared Key Authentication to be used.
MAC Filtering Mode	Disable: If Disable is selected, MAC Filtering Mode will be deactivated. Allow: If Allow is selected, the Router will allow only the devices that are configured in the MAC filter table. Deny: If Deny is selected, the Router will deny all devices that are configured in the MAC filter table.
MAC Filtering Settings	Click this link to add a MAC address to the MAC filtering list. Details on this feature are discussed later in this section.
Transmission Rate	Selecting a transmission rate allows you to adjust the bit rate of the Router's wireless transmissions. Select a transmission rate from the drop-down list, or select Auto to allow the Router to automatically select the best transmission rate.
CTS Protection Mode	Clear to Send (CTS) allows the 802.11 b/g networks to operate a maximum efficiency. Auto: Select Auto to activate CTS. None: Select None to deactivate CTS. Always: Select Always to allow CTS to always be activated.
CTS Protection Type	CTS (Clear to Send) protection mode allows mixed 802.11b/g networks to operate at maximum efficiency. RTS (Request to Send) controls what size data packet the low level RF protocol issues to an RTS packet.





03/24/09 - DRAFT

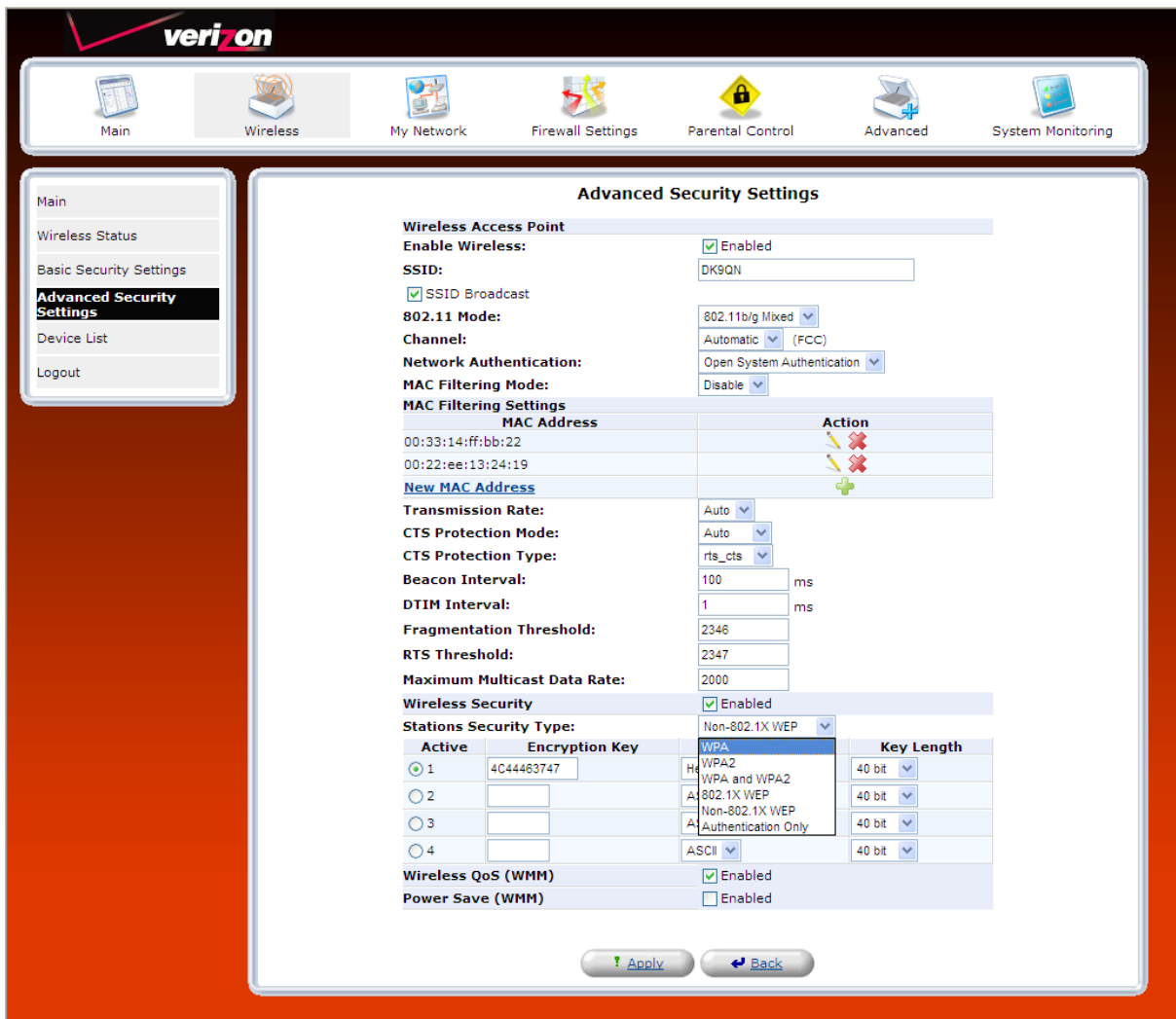
Verizon FiOS Router (Model 9100EM)

User Guide

	Select cts_only to activate this feature. Select cts_rts to activate this feature.
Beacon Interval (in milliseconds)	Enter the beacon interval value. The beacon interval is the time between beacon frame transmissions. Beacons are transmitted by the Router to help identify wireless networks. Beacons contain rate and capability information. Beacons received by stations can be used to identify the wireless access points in the area.
DTIM Interval (in milliseconds)	Enter the DTIM (Delivery Traffic Indication Message) interval value. A DTIM is a countdown mechanism for the Router. It informs wireless network clients of the next window for listening to broadcast and multicast messages.
Fragmentation Threshold	Setting the fragmentation threshold can increase the reliability of frame transmissions on the wireless network. Any MAC Service Data Unit (MSDU) or MAC Protocol Data Unit (MPDU) larger than this value will be fragmented into an MPDU of the specified size.
RTS Threshold	Enter the RTS (Request to Send) threshold. This setting controls what size data packet the low level RF protocol issues to an RTS packet. RTS/CTS handshaking will be performed for any data or management MPDU containing a number of bytes greater than the threshold. If this value is larger than the MSDU size (typically set by the fragmentation threshold), no handshaking will be performed. A value of zero will enable handshaking for all MPDUs.
Maximum Multicast Data Rate	The maximum rate (in kb/s) at which multicast packets are transmitted over your network.
Wireless Security	When this feature is enabled (the box contains a check mark), wireless security is activated, and the security type can be configured. When the box is clear, wireless security is deactivated. By factory default, Wireless Security is disabled.
Stations Security Type	Set the type of security for the Router's wireless network. Choose from the following options: WPA, WPA2, WPA and WPA2, 802.1x WEP, Non-802.1x WEP, Authentication Only. Details on these options are discussed later in this section.
Authentication Method	This is the authentication method used with the security type.
Wireless QoS (WMM)	Wi-Fi Multimedia (WMM) is a Wi-Fi Alliance certification, based on the IEEE 802.11e draft standard. It provides basic Quality of Service (QoS) features to IEEE 802.11 networks. If your wireless card supports WMM, enable this feature by checking its 'Enabled' check-box.
Power Save (WMM)	WMM® Power Save is a set of features for Wi-Fi networks that help conserve battery power in small devices such as phones, PDAs, and audio players.

### 11.3.5 Configuring the Stations Security Type

To configure the Router’s wireless security type for the wireless network, in the **Advanced Security Settings** screen, select an option from the **Stations Security Type** drop-down list. The following sections describe each security type.



**Advanced Security Settings**

**Wireless Access Point**

Enable Wireless:  Enabled

SSID: DK9QN

SSID Broadcast

802.11 Mode: 802.11b/g Mixed

Channel: Automatic (FCC)

Network Authentication: Open System Authentication

MAC Filtering Mode: Disable

**MAC Filtering Settings**

MAC Address	Action
00:33:14:ff:bb:22	
00:22:ee:13:24:19	
<a href="#">New MAC Address</a>	

Transmission Rate: Auto

CTS Protection Mode: Auto

CTS Protection Type: rts\_cts

Beacon Interval: 100 ms

DTIM Interval: 1 ms

Fragmentation Threshold: 2346

RTS Threshold: 2347

Maximum Multicast Data Rate: 2000

Wireless Security:  Enabled

**Stations Security Type:** Non-802.1X WEP

Active	Encryption Key	Key Length
<input checked="" type="radio"/> 1	4C44463747	40 bit
<input type="radio"/> 2		40 bit
<input type="radio"/> 3		40 bit
<input type="radio"/> 4		40 bit

Wireless QoS (WMM):  Enabled

Power Save (WMM):  Enabled

[Apply](#) [Back](#)





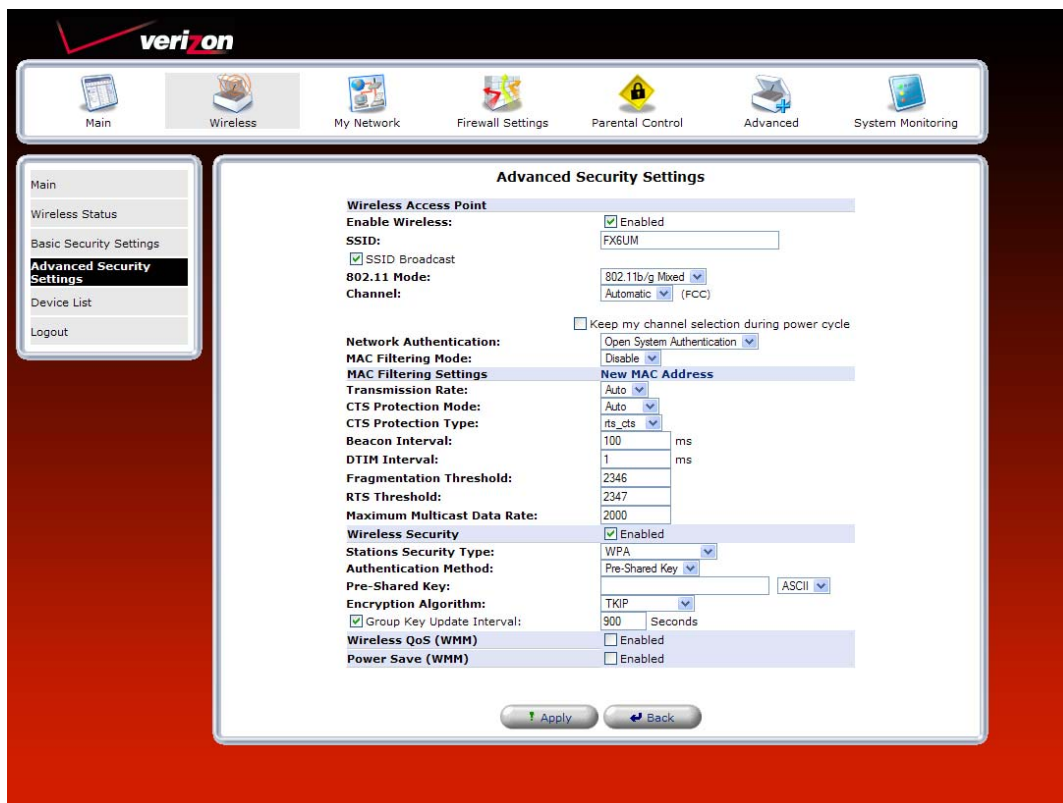
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

### 11.3.5.1 WPA (Wi-Fi Protected Access v.1)

If you select **WPA** in the **Stations Security Type** drop-down list, the following screen appears. WPA allows you to enable a pre-shared key for your home network or for advanced security for an enterprise network. This option allows stations that support WPA v.1 to connect to the Router.



WPA Wireless Security	
Wireless Security	Factory Default = Enabled When this feature is enabled (the box contains a check mark), wireless security is activated. If the box is cleared, wireless security will be deactivated.
Stations Security Type	Factory Default = Non-8.2.1x WEP Set the type of security for the Router's wireless network. Choose from the following options: Details on these options are discussed later in this section. WPA – Allows stations that support WPA v.1 to connect to the Router. WPA2 – Allows stations that support WPA v.2 to connect to the Router. WPA and WPA2 – Allows stations that support WPA and WPA2 to connect to the Router. 802.1x WEP – Allows stations that support 802.1x WEP to connect to the Router. Non-802.1x WEP – Allows stations that support Non-802.1x WEP to connect to the Router. Authentication Only – Allows stations that support Authentication Only to connect to the Router.
Authentication Method	Factory Default = Personal (Pre-Shared Key) Pre-Shared Key – WPA stations share a pre-shared key (string format) with the Router and do not authenticate with the RADIUS server.



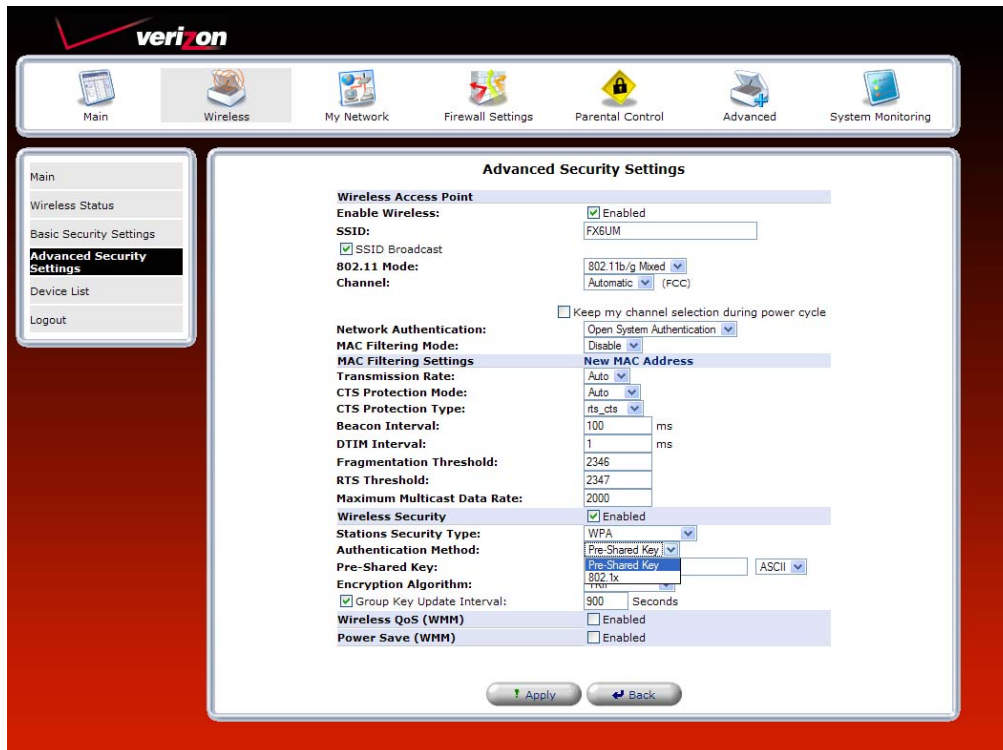
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

	802.1x – WPA stations authenticate with the RADIUS server using EAP-TLS over 802.1x, a standard for passing extensible authentication protocol (EAP) for authentication purposes. EAP is used to communicate authentication information between the supplicant and the authentication server. With 802.1x, EAP messages are packaged in Ethernet frames, rather than using and PPP.
Pre-Authentication	Factory Default = Disabled To Enable this feature, click the box (a check mark will appear in the box).
WPA Pre-Shared Key	The WPA key can be either 8 to 63 text (ASCII) characters or 64 hexadecimal (Hex) characters. The only allowable hexadecimal characters are: A-F and 0-9.
Encryption Algorithm	Factory Default = TKIP Select the encryption algorithm you want to use (TKIP, AES, or TKIP and AES). TKIP: Select this option to enable the Temporal Key Integrity Protocol for data encryption. AES: Select this option to enable the Advanced Encryption Standard for data encryption. TKIP and AES: Select this option to enable the Router to accept TKIP and AES encryption.
Group Key Update Interval (in seconds)	The number of seconds between rekeying the WPA group key. A value of zero means that rekeying is disabled.

After you have selected WPA as the security type, select the desired authentication method from the **Authentication Method** drop-down list.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

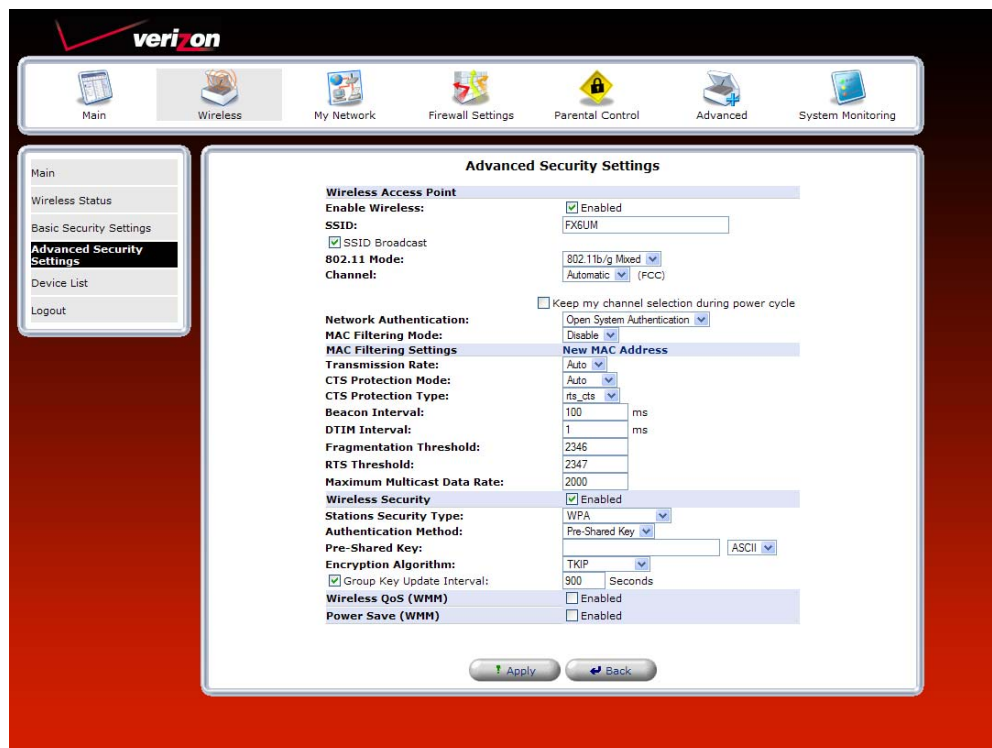
### 11.3.5.1.1 Authentication Method—Pre-Shared Key

If you select **Pre-Shared key** as the authentication method for WPA, the following screen appears. Configuring Pre-Shared Key in the Router allows devices that know the pre-shared key to connect to the Router.

**NOTE:** A WPA pre-shared key is treated as either a string of text (ASCII) characters or a set of hexadecimal (Hex) characters. The key can be either 8 to 63 text (ASCII) characters or 64 hexadecimal (Hex) characters. The only allowable hexadecimal characters are: 0-9 and A-F.

To configure the WPA Pre-Shared Key, do the following:

1. Select the string type (ASCII or HEX) in the **Pre-Shared Key** drop-down list.
2. Enter the desired pre-shared key values in the field provided.
3. Select the desired option from the **Encryptoin Algorithm** drop-down list.
  - TKIP: Select this option to enable the Temporal Key Integrity Protocol for data encryption.
  - AES: Select this option to enable the Advanced Encryption Standard for data encryption.
  - TKIP and AES: Select this option to enable the Router to accept TKIP and AES encryption.
4. Enter the desired Group Key Update Interval, and confirm that the adjacent box contains a check mark. (By factory default, Group Key Interval is enabled for 900 seconds.)
5. Click **OK** to save the wireless settings in the Router.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

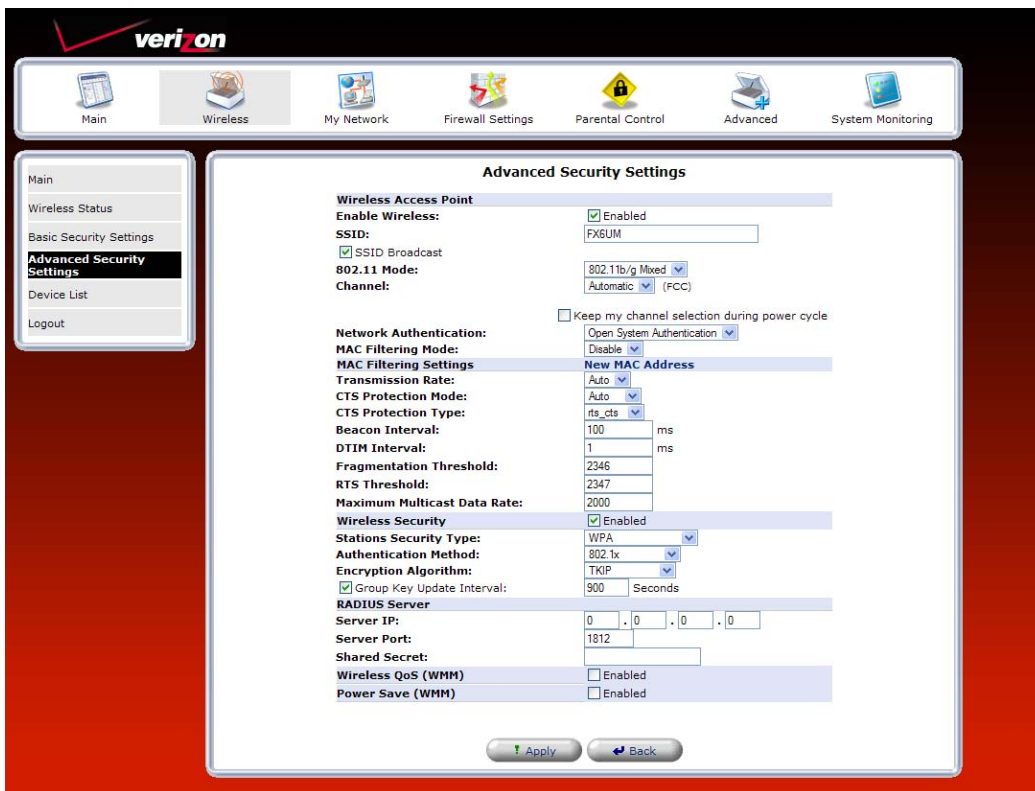
User Guide

### 11.3.5.1.2 Authentication Method—802.1x

If you select **802.1x** as the authentication method for WPA, the following screen appears. Configuring 802.1x allows devices that support 802.1x to connect to the Router.

To configure WPA authentication for 802.1x, do the following:

1. Select the desired option from the **Encryptoin Algorithm** drop-down list.
  - **TKIP**: Select this option to enable the Temporal Key Integrity Protocol for data encryption.
  - **AES**: Select this option to enable the Advanced Encryption Standard for data encryption.
  - **TKIP and AES**: Select this option to enable the Router to accept either TKIP or AES encryption.
2. Enter the desired Group Key Update Interval, and confirm that the box contains a check mark. (By factory default, Group Key Interval is enabled for 900 seconds.)
3. Configure the Radius Server:
  - a. Enter the Radius Server IP address in the fields provided.
  - b. Enter the desired Server Port value.
  - c. Enter the Shared Secret.
4. Click **OK** to save the wireless settings in the Router.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

### 11.3.5.2 WPA2 (Wi-Fi Protected Access v. 2)

If you select **WPA2** in the **Stations Security Type** drop-down list, the following screen appears. This option allows stations that support WPA v.2 to connect to the Router. The configuration settings for WPA2 are similar to the settings in WPA. Please refer to section 11.3.5.1 for instructions on configuring WPA2.

The screenshot displays the Verizon FiOS Router's web interface, specifically the "Advanced Security Settings" page. The interface features a top navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. A left sidebar contains a menu with options: Main, Wireless Status, Basic Security Settings, **Advanced Security Settings** (highlighted), Device List, and Logout. The main content area is titled "Advanced Security Settings" and is organized into several sections:

- Wireless Access Point:** Includes "Enable Wireless:" (checked, Enabled), "SSID:" (text field with "FX6UM"), "SSID Broadcast:" (checked), "802.11 Mode:" (dropdown menu set to "802.11b/g Mixed"), "Channel:" (dropdown menu set to "Automatic (FCC)"), and a checkbox for "Keep my channel selection during power cycle" (unchecked).
- Network Authentication:** Includes "Open System Authentication" (dropdown menu).
- MAC Filtering Mode:** Includes "Disable" (dropdown menu).
- MAC Filtering Settings:** Includes "New MAC Address" (text field).
- Transmission Rate:** Includes "Auto" (dropdown menu).
- CTS Protection Mode:** Includes "Auto" (dropdown menu).
- CTS Protection Type:** Includes "rts\_cts" (dropdown menu).
- Beacon Interval:** Includes "100" (text field) and "ms" (unit).
- DTIM Interval:** Includes "1" (text field) and "ms" (unit).
- Fragmentation Threshold:** Includes "2346" (text field).
- RTS Threshold:** Includes "2347" (text field).
- Maximum Multicast Data Rate:** Includes "2000" (text field).
- Wireless Security:** Includes "Enabled" (checked).
- Stations Security Type:** Includes "WPA2" (dropdown menu).
- Authentication Method:** Includes "802.1x" (dropdown menu).
- Pre Authentication:** Includes an unchecked checkbox.
- Encryption Algorithm:** Includes "AES" (dropdown menu).
- Group Key Update Interval:** Includes "900" (text field) and "Seconds" (unit).
- RADIUS Server:** Includes "Server IP:" (text field with "0 . 0 . 0 . 0"), "Server Port:" (text field with "1812"), and "Shared Secret:" (text field).
- Wireless QoS (WMM):** Includes "Enabled" (unchecked).
- Power Save (WMM):** Includes "Enabled" (unchecked).

At the bottom of the page, there are two buttons: "Apply" and "Back".



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

### 11.3.5.3 WPA and WPA2

If you select **WPA2 and WPA2** in the **Stations Security Type** drop-down list, the following screen appears. This option allows stations that support both WPA v.1 and WPA v.2 to connect to the Router. The configuration settings for this feature are similar to the settings in WPA. Please refer to section 11.3.5.1 for instructions on configuring WPA and WPA2.

The screenshot displays the 'Advanced Security Settings' page of a Verizon FiOS Router. The interface includes a top navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. A left sidebar contains a menu with options: Main, Wireless Status, Basic Security Settings, **Advanced Security Settings** (highlighted), Device List, and Logout. The main content area is titled 'Advanced Security Settings' and contains the following configuration sections:

- Wireless Access Point**
  - Enable Wireless:  Enabled
  - SSID: FX6UM
  - SSID Broadcast:
  - 802.11 Mode: 802.11b/g Mixed
  - Channel: Automatic (FCC)
  - Keep my channel selection during power cycle
- Network Authentication:** Open System Authentication
- MAC Filtering Mode:** Disable
- MAC Filtering Settings** (New MAC Address)
- Transmission Rate: Auto
- CTS Protection Mode: Auto
- CTS Protection Type: rts\_cts
- Beacon Interval: 100 ms
- DTIM Interval: 1 ms
- Fragmentation Threshold: 2346
- RTS Threshold: 2347
- Maximum Multicast Data Rate: 2000

**Wireless Security**

- Wireless Security:  Enabled
- Stations Security Type: WPA and WPA2
- Authentication Method: 802.1x
- Pre Authentication
- Encryption Algorithm: AES
- Group Key Update Interval: 900 Seconds

**RADIUS Server**

- Server IP: 0 . 0 . 0 . 0
- Server Port: 1812
- Shared Secret: [Empty field]

**Wireless QoS (WMM)**  Enabled

**Power Save (WMM)**  Enabled

At the bottom of the page are 'Apply' and 'Back' buttons.





03/24/09 - DRAFT

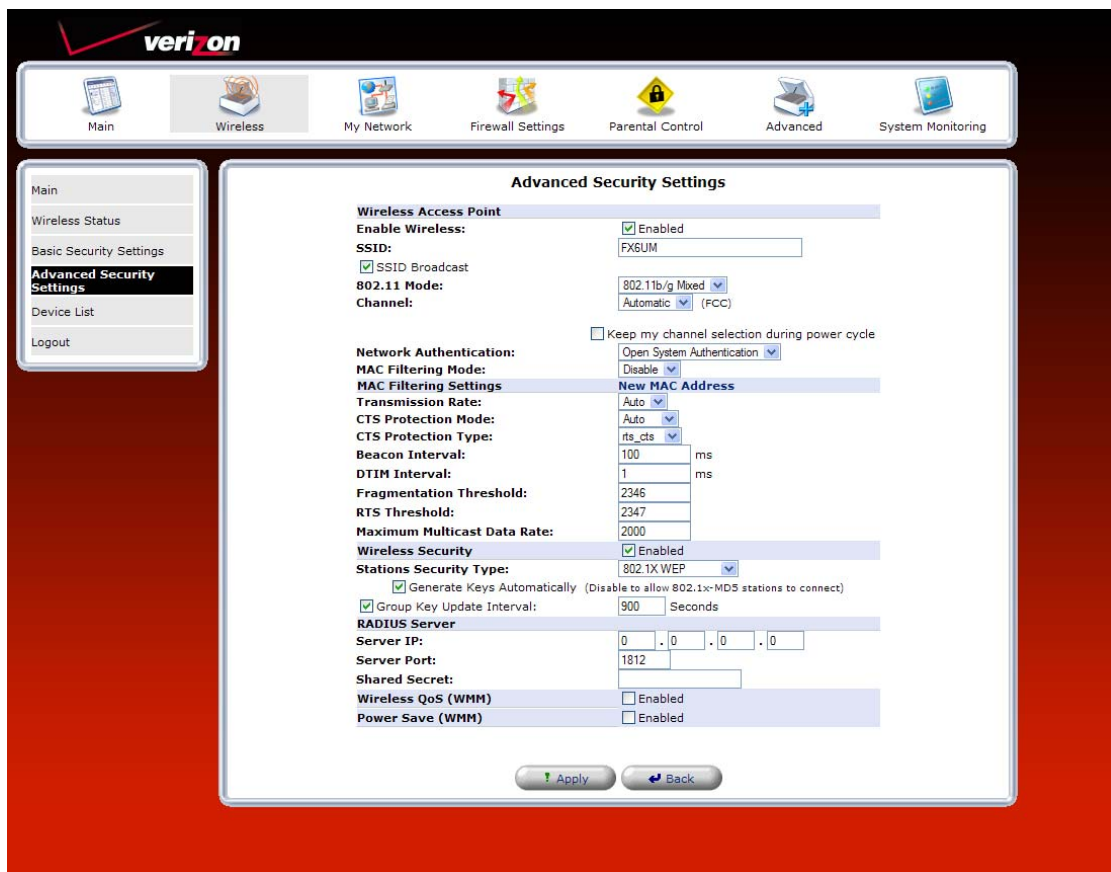
Verizon FiOS Router (Model 9100EM)

User Guide

### 11.3.5.4 802.1x WEP

If you select **802.1x WEP** in the **Stations Security Type** drop-down list, the following screen appears. The 802.1x WEP feature allows you to enable WEP keys for wireless security. In addition, 802.1x WEP security uses a Remove Authentication Dial-in Service (RADIUS) server for authentication purposes. The server must be physically connected to the Router. The Router's card supports 40-bit or 104-bit WEP encryption. If 802.1x WEP is used, any station can connect to the Router as long as its SSID and WEP key values match the Router's values.

**NOTE:** Client PCs can use any Wireless 802.11b/g card to communicate with the Router. By default your Router is configured (enabled) for 802.1X WEP (Wired Equivalent Privacy) security. Whenever, WEP is configured, the PC's wireless card must use the same WEP security code type as the one provided in Router. The WEP security code is located on a label on the bottom of the Router. Always check that your PC's wireless adapter is configured properly for whichever network setting you use: WEP or WPA. You can configure the settings in the advanced properties of the PC's wireless network adapter.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

#### 11.3.5.4.1 Configuring Automatic WEP Encryption Keys

The 802.1x WEP security protocol uses port control with dynamically changing encryption keys automatically updated over the network. To configure 802.1x WEP to generate keys automatically, do the following:

1. Select the **Generate Keys Automatically** check box if you want the Router to automatically create the WEP security keys. A check mark will appear in the box, and the **Encryption Key** table will be removed from the screen.

**NOTE:** Disable (clear) the **Generation Keys Automatically** check box to allow 802.1x-MD5 stations to connect to the Router

2. Enter the desired Group Key Update Interval, and confirm that the box contains a check mark. (By factory default, Group Key Interval is enabled for 900 seconds.)
3. Configure the Radius Server:
  - a. Enter the Radius Server IP address in the fields provided.
  - b. Enter the desired Server Port value.
  - c. Enter the Shared Secret.
4. Click **OK** to save the wireless settings in the Router.

#### 11.3.5.4.2 Configuring Manual WEP Encryption Keys

To configure 802.1x WEP with manual encryption keys, do the following:

1. Clear the **Generate Keys Automatically** check box. The Key Encryption table will appear in the screen.

**NOTE:** Disable (clear) the Generation Keys Automatically check box to allow 802.1x-MD5 stations to connect to the Router.

2. At the Key Encryption table, select a key (1 through 4) that you want to activate.
3. Enter the desired encryption key.

**NOTE:** A WEP encryption key is treated as either a string of text (ASCII) characters or a set of hexadecimal (Hex) characters. The number of text characters must be either 5 (for 40 bit encryption) or 13 (for 104 bit encryption). The number of Hex characters must be either 10 (for 40 bit encryption) or 26 (for 104 bit encryption). The only allowable hexadecimal characters are: A-F and 0-9.

4. Select the Entry Method (ASCII or Hex) from the drop-down list.
5. Select the Key Length (40 bit or 104 bit) from the drop-down list.
6. Enter the desired Group Key Update Interval, and confirm that the box contains a check mark. (By factory default, Group Key Interval is enabled for 900 seconds.)
7. Configure the Radius Server by doing the following:
  - a. Enter the Radius Server IP address in the fields provided.
  - b. Enter the desired Server Port value.
  - c. Enter the Shared Secret.
8. Click **OK** to save the wireless settings in the Router.





03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

### 11.3.5.5 Non-802.1x WEP

If you select **Non-802.1x WEP** in the **Stations Security Type** drop-down list, the following screen appears. The Non-802.1x WEP feature allows you to enable a WEP key for wireless security without using a RADIUS server. The Router's card supports 40-bit or 104-bit WEP encryption. Whenever Non-802.1x WEP is used, any station can connect to the Router as long as its SSID and WEP key values match the Router's values.

To configure the Router for Non-802.1x WEP, do the following:

1. At the Key Encryption table, select a key (1 through 4) that you want to activate.
2. Enter the desired encryption key.

**NOTE:** A WEP encryption key is treated as either a string of text (ASCII) characters or a set of hexadecimal (Hex) characters. The number of text characters must be either 5 (for 40-bit encryption) or 13 (for 104-bit encryption). The number of Hex characters must be either 10 (for 40-bit encryption) or 26 (for 104-bit encryption). The only allowable hexadecimal characters are: A-F and 0-9.

3. Select the Entry Method (ASCII or Hex) from the drop-down list.
4. Select the Key Length (40 bit or 104 bit) from the drop-down list.
5. Click **OK** to save the wireless settings in the Router.

The screenshot displays the Verizon FiOS Router's web interface, specifically the 'Advanced Security Settings' page. The interface includes a navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. A sidebar on the left contains a menu with options: Main, Wireless Status, Basic Security Settings, **Advanced Security Settings**, Device List, and Logout. The main content area is titled 'Advanced Security Settings' and contains several sections:

- Wireless Access Point:** Includes 'Enable Wireless' (checked), 'SSID' (FXGUM), '802.11 Mode' (802.11b/g Mixed), and 'Channel' (Automatic). There is a checkbox for 'Keep my channel selection during power cycle'.
- Network Authentication:** Set to 'Open System Authentication'.
- MAC Filtering Mode:** Set to 'Disable'.
- MAC Filtering Settings:** A section for 'New MAC Address'.
- Transmission Rate:** Set to 'Auto'.
- CTS Protection Mode:** Set to 'Auto'.
- CTS Protection Type:** Set to 'rts\_cts'.
- Beacon Interval:** 100 ms.
- DTIM Interval:** 1 ms.
- Fragmentation Threshold:** 2346.
- RTS Threshold:** 2347.
- Maximum Multicast Data Rate:** 2000.
- Wireless Security:** Checked.
- Stations Security Type:** Set to 'Non-802.1x WEP'.
- Stations Security Table:** A table with columns: Active, Encryption Key, Entry Method, and Key Length. It lists four keys, with the first one (key 1) being active and having a hexadecimal key 'D5D8BB85CE', 'Hex' entry method, and '40 bit' key length.
- Wireless QoS (WMM):** Not checked.
- Power Save (WMM):** Not checked.

At the bottom of the page, there are 'Apply' and 'Back' buttons.

### 11.3.5.6 Authentication Only

If you select **Authentication Only** in the **Stations Security Type** drop-down list, the following screen appears. This feature allows you to enable wireless security in your Router without using encryption keys or a RADIUS server. However, a station's SSID must match the Router's SSID in order to connect to the Router.



**Advanced Security Settings**

**Wireless Access Point**

Enable Wireless:  Enabled

SSID: FX6UM

SSID Broadcast

802.11 Mode: 802.11b/g Mixed

Channel: Automatic (FCC)

Keep my channel selection during power cycle

**Network Authentication:** Open System Authentication

MAC Filtering Mode: Disable

**MAC Filtering Settings** New MAC Address

Transmission Rate: Auto

CTS Protection Mode: Auto

CTS Protection Type: rts\_cts

Beacon Interval: 100 ms

DTIM Interval: 1 ms

Fragmentation Threshold: 2346

RTS Threshold: 2347

Maximum Multicast Data Rate: 2000

**Wireless Security**  Enabled

Stations Security Type: Authentication Only

Authentication Method: Web Authentication

Clean Mac List

**Wireless QoS (WMM)**  Enabled

**Power Save (WMM)**  Enabled

Apply Back



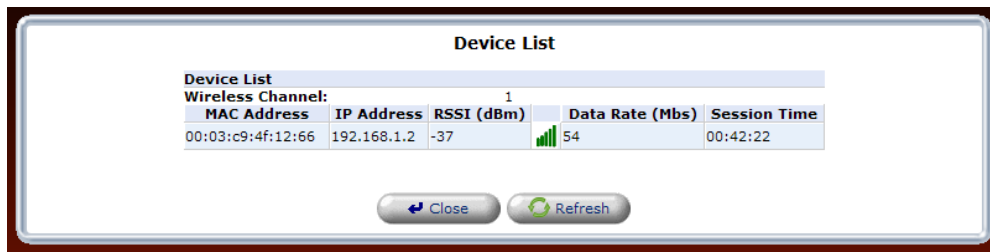
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 11.4 Device List

If you select **Wireless** from the top navigation menu and then select **Device List** in the left submenu, the following screen appears. This screen provides information about wireless devices attached to your Router. View the information in this screen, and then click **Close** to return to the Advanced Security Settings screen.

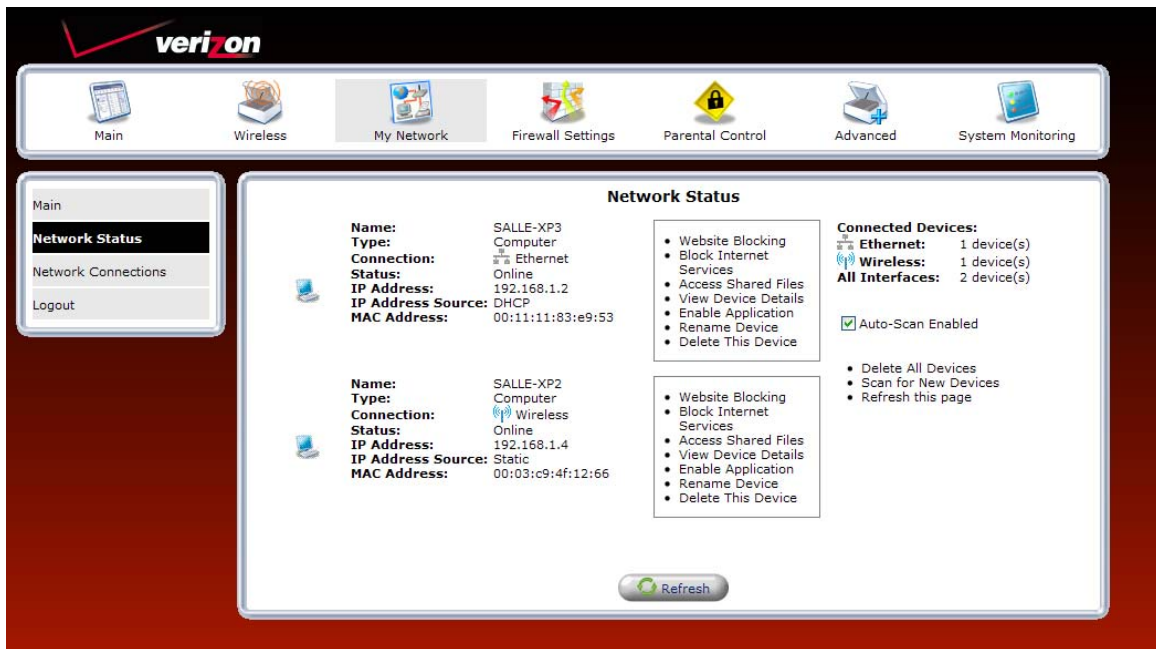


## 12. MY NETWORK

This section provides details on your Router's network connections.

### 12.1 Network Status

To view your Router's network settings, from the top navigation menu, select **Network Connections**. The following screen appears. This screen displays information about the devices connected to your local area network (LAN). Click **Refresh** to update this screen and display the most current information about devices on your network.



Network Status	
Name	The name of the device.
Type	The type of device connected to the network.
Connection	The interface used to connect to the Router. Ethernet: Displays the number of devices that are connected to the Router via Ethernet 10/100 BaseT connection. Wireless: Displays the number of devices that are connected to the Router wirelessly. Note: If you have computers on your network that are not being displayed, check the firewall setting on the PCs to ensure that the firewall is disabled.
Status	The status of the Internet connection.
IP Address	The IP address assigned to the computer.
IP Address Source	The method by which the computer receives its IP address.
MAC Address	The Media Access Controller; the hardware address assigned to the device by the manufacturer.
Connected Devices	The interface used to connect the device to the Router, and the devices connected. Ethernet: Displays the number of devices that are connected to the Router via Ethernet 10/100



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

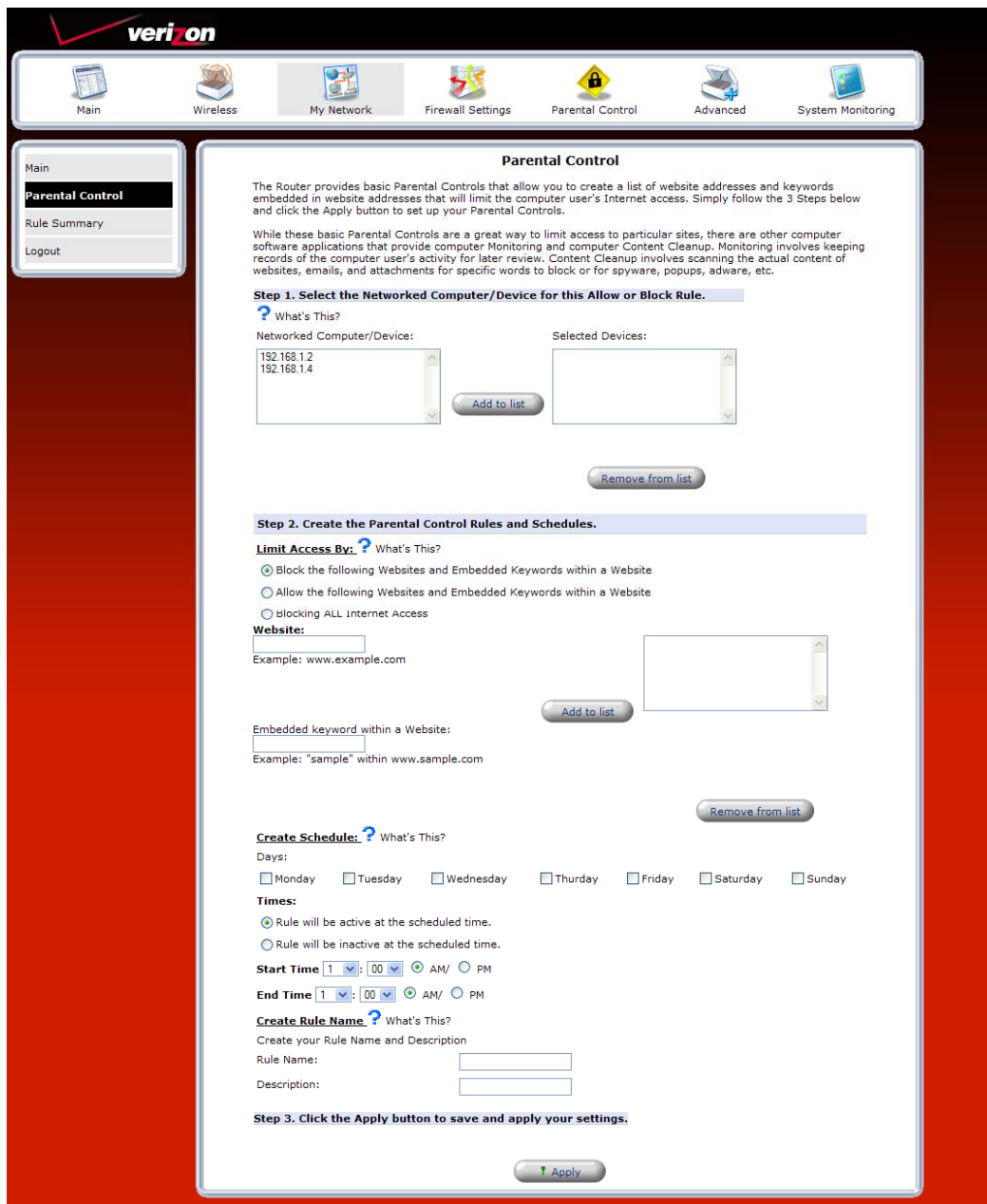
User Guide

	BaseT connection. Wireless: Displays the number of devices that are connected to the Router wirelessly. All Interfaces: Displays the total number of devices that are connected to the Router. Note: If you have computers on your network that are not being displayed, check the firewall setting on the PCs to ensure that the firewall is disabled.
Auto-Scan Enabled	When this box is checked, the Router will automatically scan for devices that are connected to the network.
Delete All Devices	Click this link to delete all devices from your network.
Scan for New Devices	Click this link to allow the Router to scan the network for new devices that may have recently connected to the network.
Refresh this page	Click this link to update this page and display the most current data.

## 12.1.1 Website Blocking

You can configure your Router to restrict access to certain websites for computers on your network. On the **Network Status** page, when you click the **Website Blocking** link, it will take you to the **Parental Control** section.

Please go to section 14, “**Parental Control**,” for information on setting up website blocking rules.



**Parental Control**

The Router provides basic Parental Controls that allow you to create a list of website addresses and keywords embedded in website addresses that will limit the computer user's Internet access. Simply follow the 3 Steps below and click the Apply button to set up your Parental Controls.

While these basic Parental Controls are a great way to limit access to particular sites, there are other computer software applications that provide computer Monitoring and computer Content Cleanup. Monitoring involves keeping records of the computer user's activity for later review. Content Cleanup involves scanning the actual content of websites, emails, and attachments for specific words to block or for spyware, popups, adware, etc.

**Step 1. Select the Networked Computer/Device for this Allow or Block Rule.**

What's This?

Networked Computer/Device: 192.168.1.2, 192.168.1.4

Selected Devices:

Add to list

Remove from list

**Step 2. Create the Parental Control Rules and Schedules.**

**Limit Access By:** What's This?

Block the following Websites and Embedded Keywords within a Website

Allow the following Websites and Embedded Keywords within a Website

Blocking ALL Internet Access

**Website:**

Example: www.example.com

Add to list

**Embedded keyword within a Website:**

Example: "sample" within www.sample.com

Remove from list

**Create Schedule:** What's This?

Days:

Monday  Tuesday  Wednesday  Thursday  Friday  Saturday  Sunday

**Times:**

Rule will be active at the scheduled time.

Rule will be inactive at the scheduled time.

**Start Time** 1 : 00 AM/ PM

**End Time** 1 : 00 AM/ PM

**Create Rule Name:** What's This?

Create your Rule Name and Description

Rule Name: \_\_\_\_\_

Description: \_\_\_\_\_

**Step 3. Click the Apply button to save and apply your settings.**

Apply



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 12.1.2 Block Internet Services

In the **Network Status** page, click the **Block Internet Services** link. Then, click **Add Access Control Rule** in the left submenu; the following screen appears. This feature allows you to block specific computers within the local network (or even your entire network) from accessing certain services on the Internet. For example, one computer can be prohibited from surfing the Internet; another computer, from transferring files using FTP; and the whole network, from receiving incoming email. To configure the settings in this screen, please follow the instructions provided in section 13.2, “Access Control.”

The screenshot shows the Verizon FiOS Router web interface. At the top, there is a navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. Below this is a left sidebar menu with options for Main, Add Access Control Rule (which is highlighted), and Logout. The main content area is titled "Add Access Control Rule" and contains the following fields:

- Address:** A text input field with a dropdown menu set to "Any".
- Protocols:** A text input field with a dropdown menu set to "Any".
- Reply an HTML Page to the Blocked Client
- Schedule:** A text input field with a dropdown menu set to "Always".

At the bottom of the form are two buttons: "OK" and "Cancel".



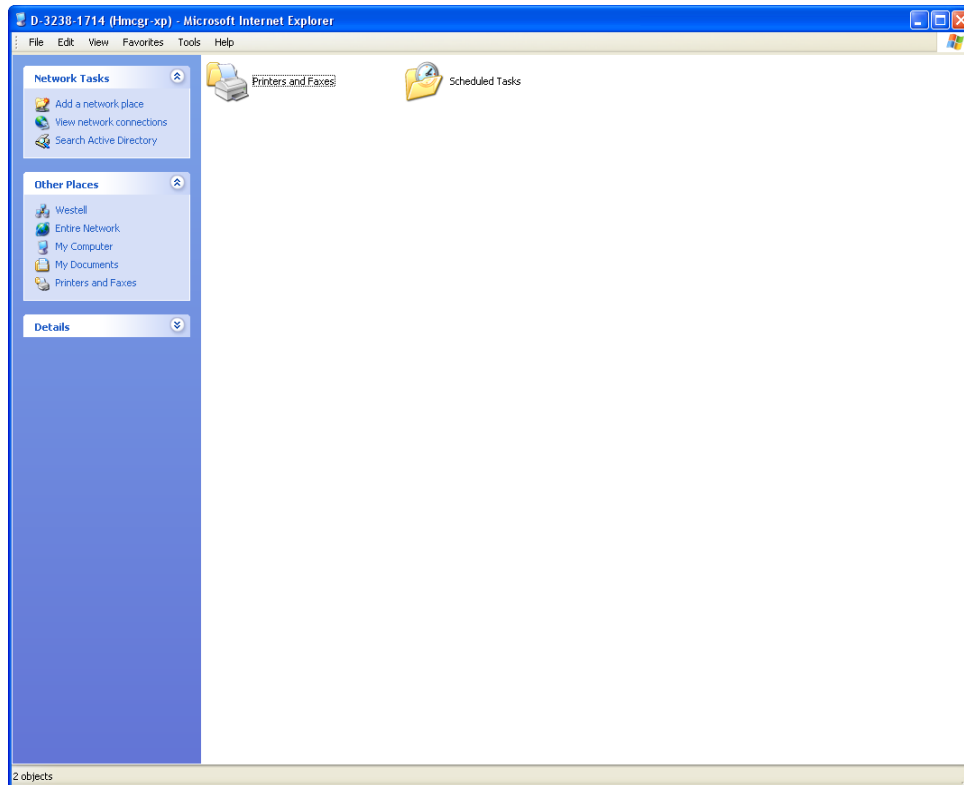
03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

### 12.1.3 Access Shared Files

In the **Network Status** page, click the **Access Shared Files** link to access files from a device on your local network. (The device from which you will access files must have file sharing enabled.) If the device has a firewall turned on, you will not be able to access shared files from the device.







03/24/09 - DRAFT


Verizon FiOS Router (Model 9100EM)

User Guide

## 12.1.4 View Device Details

In the **Network Status** page, click the **View Device Details** link. The following screen appears. Click **Refresh** to refresh the details in this screen. After you have finished viewing this screen, click **OK** to return to the **Network Status** page.

The screenshot shows the Verizon FiOS Router web interface. At the top is the Verizon logo. Below it is a navigation bar with icons and labels for: Main, Wireless, My Network (selected), Firewall Settings, Parental Control, Advanced, and System Monitoring. On the left is a sidebar menu with: Main, Network Status (selected), Network Connections, and Logout. The main content area is titled 'Device Details' and displays the following information:

	<b>Name:</b> <b>Type:</b> <b>Connection:</b> <b>Status:</b> <b>IP Address:</b> <b>IP Address Source:</b> <b>MAC Address:</b> <b>UPnP:</b> <b>NetBIOS:</b>	SALLE-XP3 Computer Ethernet Online 192.168.1.2 DHCP 00:11:11:83:e9:53 Disabled Enabled	<ul style="list-style-type: none"><li>• Website Blocking</li><li>• Block Internet Services</li><li>• Access Shared Files</li><li>• Enable Application</li><li>• Rename Device</li><li>• Delete This Device</li></ul>
---	---	--	--

At the bottom of the 'Device Details' panel are two buttons: 'OK' and 'Refresh'.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 12.1.5 Enable Application

In the **Network Status** page, click the **Enable Application** link to set up applications for your service profile, such as port forwarding services. This feature enables applications (Games, Webcams, IM & Others) by opening a tunnel between remote (Internet) computers and a specific device port inside your local area network (LAN). Details on this screen are discussed later in section 13.3, "Port Forwarding."

The screenshot shows the Verizon FiOS Router web interface. At the top, there is a navigation bar with icons for Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. On the left, a sidebar menu lists various settings: Main, General, Access Control, Port Forwarding (highlighted), DMZ Host, Port Triggering, Remote Administration, Static NAT, Advanced Filtering, Security Log, Connections, and Logout. The main content area is titled "Port Forwarding" and includes the instruction "Expose services on the LAN to external Internet users." Below this is a table with the following data:

Local Host	Local Address	Network Address	Public IP Address	Protocols	Status	Action
localhost	127.0.0.1	Any	Any	Verizon FiOS Service - TCP Any -> 4567	Active	
<b>New Entry</b>						

At the bottom of the table, there are five buttons: OK, Apply, Cancel, Resolve Now, and Refresh.



03/24/09 - DRAFT

Verizon FiOS Router (Model 9100EM)

User Guide

## 12.1.6 Rename Device

In the **Network Status** page, click the **Rename Device** link. This screen allows you to rename a device on your network. In the following screen, type the desired name in the **Name** field. Next, click **OK** to allow the changes to take effect. Click **Cancel** to return to the **Network Status** page.



## 12.1.7 Delete This Device

In the **Network Status** page, click the **Delete This Device** link to remove a device from your network.

