



**TRENDNET**<sup>®</sup>



**User's Guide**

**TEW-691GR**

**1.01**

## Federal Communication Commission Interference Statement

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### IMPORTANT NOTE:

#### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

#### Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- **EN60950-1:2006**

Safety of Information Technology Equipment

- **EN50385 : (2002-08)**

- Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110MHz - 40 GHz) - General public

- **EN 300 328 V1.7.1: (2006-10)**

- Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

- **EN 301 489-1 V1.8.1: (2008-04)**
- Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
- **EN 301 489-17 V1.3.2 (2008-04)**
- Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for 2,4 GHz wideband transmission systems, 5 GHz high performance RLAN equipment and 5,8 GHz Broadband Data Transmitting Systems

This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.

In Italy the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying public access to telecommunications and/or network services.

This device may not be used for setting up outdoor radio links in France and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 – 2483.5 MHz. For detailed information the end-user should contact the national spectrum authority in France.



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# Introduction

TRENDnet's 450Mbps Wireless N Gigabit Router, model TEW-691GR, redefines wireless router performance. This router's raw horsepower seamlessly streams HD movies to your entertainment center, transfers content from countless users, and generates record wireless coverage.

Gigabit Wide Area Network and Local Area Network ports transfer wired data fast. An Energy Star certified power adapter and embedded GREENnet technology reduce power consumption.

Advanced Multiple Input Multiple Output (MIMO) antenna technology with three spatial streams per antenna generates a maximum theoretical wireless throughput of 450Mbps. Wi-Fi Protected Setup (WPS) integrates other WPS supported wireless adapters at the touch of a button. The latest in wireless encryption and a secure firewall protect your digital network. WMM® Quality of Service (QoS) technology prioritizes gaming, Internet calls, and video streams. LEDs on the front of the router convey device status.

## FEATURES

- High-speed data rates of up to 450Mbps using an IEEE 802.11n connection
- IEEE 802.11n/b/g compliant
- 4 x 10/100/1000Mbps Auto-MDIX LAN ports
- 1 x 10/100/1000Mbps WAN port (Internet)
- On/off power switch
- On/off wireless network switch
- 1 x Wi-Fi Protected Setup (WPS) button
- One touch wireless connection using the WPS button
- Embedded energy saving GREENnet technology
- Energy Star Qualified high efficiency power adapter
- Compatible with most popular cable/DSL Internet Service Providers using Dynamic/Static IP, PPPoE, L2TP, and PPTP connection
- Advanced firewall protection with Network Address Translation (NAT) and Stateful Packet Inspection (SPI)
- Access restriction with Internet Access Control: MAC, Protocol, and Domain filtering
- Virtual server and Application Level Gateway (ALG) services for special Internet applications
- Universal Plug and Play (UPnP) for auto discovery and support for device configuration of Internet applications like RTP/RTSP, SIP, FTP, TFTP, NTP, and SMTP
- Multiple pass-through sessions for popular VPN applications (IPSec, L2TP, and PPTP)
- Advanced QoS support includes: Uplink speed control, IP prioritization, and Wi-Fi Multimedia (WMM)
- Complete wireless security with WPA/WPA2-RADIUS, WPA /WPA2-PSK, and WEP

\*Maximum wireless signal rates are referenced from IEEE 802.11 theoretical specifications. Actual data throughput and coverage will vary depending on interference, network traffic, building materials and other conditions.

# Getting Started

Congratulations on purchasing the TEW-691GR! This manual provides information for setting up and configuring the TEW-691GR. This manual is intended for both home users and professionals.

## PACKAGE CONTENTS

- TEW-691GR 450Mbps Wireless N Gigabit Router
- CD-ROM (User's Guide)
- Multi-Language Quick Installation Guide
- CAT-5 Ethernet Cable
- Power Adapter (12V, 1A)

Using a power supply with a different voltage than the one included with your product will cause damage and void the warranty for this product.

## MINIMUM SYSTEM REQUIREMENTS

- Ethernet-Based Cable or DSL Modem
- Computers with Windows, Macintosh, or Linux-based operating systems with an installed Ethernet adapter and CD-ROM Drive

## HARDWARE OVERVIEW

### LED Indications: (from left to right)

- ◆ WPS
- ◆ WLAN
- ◆ Reserve
- ◆ LAN1
- ◆ LAN2
- ◆ LAN3
- ◆ LAN4
- ◆ WAN
- ◆ PWR



### Rear panel: (from left to right)

- ◆ DC-IN
- ◆ RESET
- ◆ Power switch
- ◆ Wi-Fi on/off switch
- ◆ WAN
- ◆ LAN1
- ◆ LAN2
- ◆ LAN3
- ◆ LAN4



## WIRELESS PERFORMANCE CONSIDERATIONS

There are a number of factors that can impact the range of wireless devices.

1. Adjust your wireless devices so that the signal is traveling in a straight path, rather than at an angle. The more material the signal has to pass through the more signal you will lose.
2. Keep the number of obstructions to a minimum. Each obstruction can reduce the range of a wireless device. Position the wireless devices in a manner that will minimize the amount of obstructions between them.
3. Building materials can have a large impact on your wireless signal. In an indoor environment, try to position the wireless devices so that the signal passes through less dense material such as dry wall. Dense materials like metal, solid wood, glass or even furniture may block or degrade the signal.
4. Antenna orientation can also have a large impact on your wireless signal. Use the wireless adapter's site survey tool to determine the best antenna orientation for your wireless devices.
5. Interference from devices that produce RF (radio frequency) noise can also impact your signal. Position your wireless devices away from anything that generates RF noise, such as microwaves, radios and baby monitors.
6. Any device operating on the 2.4GHz frequency will cause interference. Devices such as 2.4GHz cordless phones or other wireless remotes operating on the 2.4GHz frequency can potentially drop the wireless signal. Although the phone may not be in use, the base can still transmit wireless signal. Move the phone's base station as far away as possible from your wireless devices.

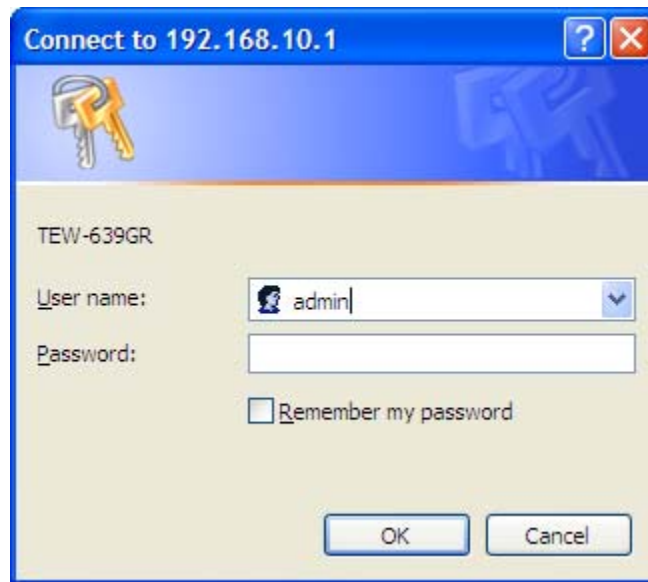
If you are still experiencing low or no signal consider repositioning the wireless devices or installing additional access points. The use of higher gain antennas may also provide the necessary coverage depending on the environment.



# Using the Configuration Menu

Whenever you want to configure your TEW-691GR, you can access the Configuration Menu through your PC by opening the Web-browser and typing in the IP Address of the TEW-691GR. The TEW-691GR's default IP Address is <http://192.168.10.1>

- Open the Web browser.
- Type in the **IP Address** of the Router (<http://192.168.10.1> )



If you have changed the default IP Address assigned to the TEW-691GR, make sure to enter the correct IP Address.

- Select **admin** in the **User Name** field.
- Leave the **Password** blank.
- Click **Login In**.

# Network

## WAN SETTING

**Network**

- WAN Setting
- LAN Setting
- QoS
- DHCP Client List

**Wireless**

**Advanced**

**Administrator**

**Help**

### Wide Area Network (WAN) Settings

You may choose different connection type suitable for your environment. Besides, you may also configure parameters according to the selected connection type.

**WAN Connection Type**

Connection Type: DHCP

**DHCP Setting**

Host Name (optional):

Manually configure DNS: Disable

**WAN MTU Setting**

Use Default MTU Setting: Enable

MTU Setting: 1500 (bytes) default=1500 bytes

**MAC Address Clone**

MAC Clone: Disable

Apply Cancel

### WAN Connection Type

There are several connection types to choose from: Static IP, DHCP, PPPoE, PPTP, L2TP, and Russia PPTP. If you are unsure of your connection method, please contact your Internet Service Provider. Static

Used when your ISP provides you a set IP address that does not change. The IP information is manually entered in your IP configuration settings. You must enter the IP address, Subnet Mask, Gateway, Primary DNS Server, and Secondary DNS Server. Your ISP provides you with all of this information.

### DHCP

A method of connection where the ISP assigns your IP address when your router requests one from the ISP's server.

**Host Name:** Some ISP's may check your computer's Host Name. The Host Name identifies your system to the ISP's server.

### PPPoE

Select this option if your ISP requires you to use a PPPoE (Point to Point Protocol over Ethernet) connection. DSL providers typically use this option. This method of connection requires you to enter a **Username** and **Password** (provided by your Internet Service Provider) to gain access to the Internet.

**Reconnect Mode:** Typically PPPoE connections are not always on. The router allows you to set the reconnection mode. The settings are:

**Always on:** A connection to the Internet is always maintained.

**On demand:** A connection to the Internet is made as needed.

**Manual:** You have to open up the Web-based management interface and click the Connect button manually any time that you wish to connect to the Internet.

**Maximum Idle Time:** Time interval the machine can be idle before the PPPoE connection is disconnected. The Maximum Idle Time value is only used for the "On demand" and "Manual" reconnect modes.

#### **L2TP**

L2TP (Layer Two Tunneling Protocol) uses a virtual private network to connect to your ISP. This method of connection requires you to enter a Username and Password (provided by your Internet Service Provider) to gain access to the Internet.

**L2TP Server IP Address:** The ISP provides this parameter, if necessary. The value may be the same as the Gateway IP Address.

**Reconnect Mode:** Typically PPPoE connections are not always on. The router allows you to set the reconnection mode. The settings are:

**Always on:** A connection to the Internet is always maintained.

**On demand:** A connection to the Internet is made as needed.

**Manual:** You have to open up the Web-based management interface and click the Connect button manually any time that you wish to connect to the Internet.

**Maximum Idle Time:** Time interval the machine can be idle before the PPPoE connection is disconnected. The Maximum Idle Time value is only used for the "On demand" and "Manual" reconnect modes.

#### **WAN Interface IP Type**

**Static:** If your ISP has assigned a fixed IP address, select this option. The ISP provides the values for the following fields for **WAN Interface IP Setting: IP Address, Subnet Mask, Default Gateway.**

**Dynamic:** If the ISP's servers assign the router's IP addressing upon establishing a connection, select this option.

#### **PPTP**

PPTP (Point to Point Tunneling Protocol) uses a virtual private network to connect to your ISP. This method of connection is primarily used in Europe. This method of connection requires you to enter a **Username** and **Password** (provided by your Internet Service Provider) to gain access to the Internet.

**PPTP Server IP Address:** The ISP provides this parameter, if necessary. The value may be the same as the Gateway IP Address.

**Reconnect Mode:** Typically PPPoE connections are not always on. The router allows you to set the reconnection mode. The settings are:

**Always on:** A connection to the Internet is always maintained.

**On demand:** A connection to the Internet is made as needed.

**Manual:** You have to open up the Web-based management interface and click the Connect button manually any time that you wish to connect to the Internet.

**Maximum Idle Time:** Time interval the machine can be idle before the PPPoE connection is disconnected. The Maximum Idle Time value is only used for the "On demand" and "Manual" reconnect modes.

#### **WAN Interface IP Type**

**Static:** If your ISP has assigned a fixed IP address, select this option. The ISP provides the values for the following fields for **WAN Interface IP Setting: IP Address, Subnet Mask, Default Gateway,** and optional for **DNS Server**

**Dynamic:** If the ISP's servers assign the router's IP addressing upon establishing a connection, select this option.

#### **Russia PPTP**

The Russia PPTP can configure IP address on the WAN interface and establish PPTP to get IP address, subnet mask, default gateway and DNS for ANOTHER logical IP interface on WAN port. So the physical WAN port will have 2 logical IP interfaces and can communicate with internal ISP's network resources and also communicate with Internet through PPTP tunnel. It is specified by Russia Cobrina ISP, user can configure it the same as the normal PPTP and PPTP server IP Address can use the domain name string.

WAN MTU Setting

The Maximum Transmission Unit (MTU) is a parameter that determines the largest packet size (in bytes) that the router will send to the WAN. If LAN devices send larger packets, the router will break them into smaller packets. Ideally, you should set this to match the MTU of the connection to your ISP. Typical values are 1500 bytes for an Ethernet connection and 1492 bytes for a PPPoE connection. If the router's MTU is set too high, packets will be fragmented downstream. If the router's MTU is set too low, the router will fragment packets unnecessarily and in extreme cases may be unable to establish some connections. In either case, network performance can suffer. t modes.

### **MAC Address Clone**

Each networking device has its own unique MAC address defined by the hardware manufacturer. Some ISP's may check your computer's MAC address. Some ISP's record the MAC address of the network adapter in the computer or router used to initially connect to their service. The ISP will then only grant Internet access to requests from a computer or router with this particular MAC address. This router has a different MAC address than the computer or router that initially connected to the ISP. If you need to change the MAC address of the router's WAN-side Ethernet interface, either type in an alternate MAC address (for example, the MAC address of the router initially connected to the ISP) or copy the MAC address of a PC. To copy the MAC address of the computer that initially connected to the ISP, connect to the router using that computer and click the **Clone Your PC's MAC Address** button. The WAN interface will then use the MAC address of the network adapter in your computer.

# LAN SETTING

**Network**

- WAN Setting
- **LAN Setting**
- QoS
- DHCP Client List

**Wireless**

**Advanced**

**Administrator**

**Help**

## Local Area Network (LAN) Settings

You may choose different connection type suitable for your environment. Besides, you may also configure parameters according to the selected connection type.

### LAN Interface Setting

IP Address	<input type="text" value="192.168.10.1"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
MAC Address	00:11:E0:01:08:88

### DHCP Server Setting

DHCP Server	<input type="button" value="Enable"/>
DHCP Start IP	<input type="text" value="192.168.10.100"/>
DHCP End IP	<input type="text" value="192.168.10.200"/>
DHCP Lease Time	<input type="text" value="604800"/> (seconds)

### Add DHCP Reservation

Enable	<input type="checkbox"/>
Computer Name	<input type="text"/>
IP Address	<input type="text"/>
MAC Address	<input type="text"/> (Ex: 00:11:22:33:44:55)

### DHCP Reservations List

Enable	Computer Name	IP Address	MAC Address	Edit	Delete
--------	---------------	------------	-------------	------	--------

## IP Address

The IP address of the this device on the local area network. Assign any unused IP address in the range of IP addresses available for the LAN.

## Subnet Mask

The subnet mask of the local area network.

## DHCP Server Settings

DHCP stands for Dynamic Host Configuration Protocol. The DHCP section is where you configure the built-in DHCP Server to assign IP addresses to the computers and other devices on your local area network (LAN).

## Enable DHCP Server

Once your router is properly configured and this option is enabled, the DHCP Server will manage the IP addresses and other network configuration information for computers and other devices connected to your Local Area Network. There is no need for you to do this yourself.

The computers (and other devices) connected to your LAN also need to have their TCP/IP configuration set to "DHCP" or "Obtain an IP address automatically". When you set **Enable DHCP Server**, the following options are displayed.

#### **DHCP IP Address Range**

These two IP values (Start and End) define a range of IP addresses that the DHCP Server uses when assigning addresses to computers and devices on your Local Area Network. Any addresses that are outside of this range are not managed by the DHCP Server; these could, therefore, be used for manually configured devices or devices that cannot use DHCP to obtain network address details automatically.

It is possible for a computer or device that is manually configured to have an address that does reside within this range. In this case the address should be reserved, so that the DHCP Server knows that this specific address can only be used by a specific computer or device.

Your router, by default, has a static IP address of 192.168.10.1. This means that addresses 192.168.10.2 to 192.168.10.254 can be made available for allocation by the DHCP Server.

#### **Subnet Mask**

The subnet mask of the local area network.

#### **Gateway**

The IP address of the router on the local area network. For example, 192.168.10.1.

#### **DHCP Lease Time**

The amount of time that a computer may have an IP address before it is required to renew the lease. The lease functions just as a lease on an apartment would. The initial lease designates the amount of time before the lease expires. If the tenant wishes to retain the address when the lease is expired then a new lease is established. If the lease expires and the address is no longer needed than another tenant may use the address.

#### **Add/Edit DHCP Reservation**

This option lets you reserve IP addresses, and assign the same IP address to the network device with the specified MAC address any time it requests an IP address. This is almost the same as when a device has a static IP address except that the device must still request an IP address from the router. The router will provide the device the same IP address every time. DHCP Reservations are helpful for server computers on the local network that are hosting applications such as Web and FTP. Servers on your network should either use a static IP address or use this option.

#### **Computer Name**

You can assign a name for each computer that is given a reserved IP address. This may help you keep track of which computers are assigned this way. Example: **Game Server**.

#### **IP Address:**

The LAN address that you want to reserve.

#### **MAC Address**

To input the MAC address of your system, enter it in manually or connect to the router's Web-Management interface from the system and click the **Copy Your PC's MAC Address** button. A MAC address is usually located on a sticker on the bottom of a network device. The MAC address is comprised of twelve digits. Each pair of hexadecimal digits are usually separated by dashes or colons such as 00-0D-88-11-22-33 or 00:0D:88:11:22:33. If your network device is a computer and the network card is already located inside the computer, you can connect to the router from the computer and click the **Copy Your PC's MAC Address** button to enter the MAC address.

#### **Clear**

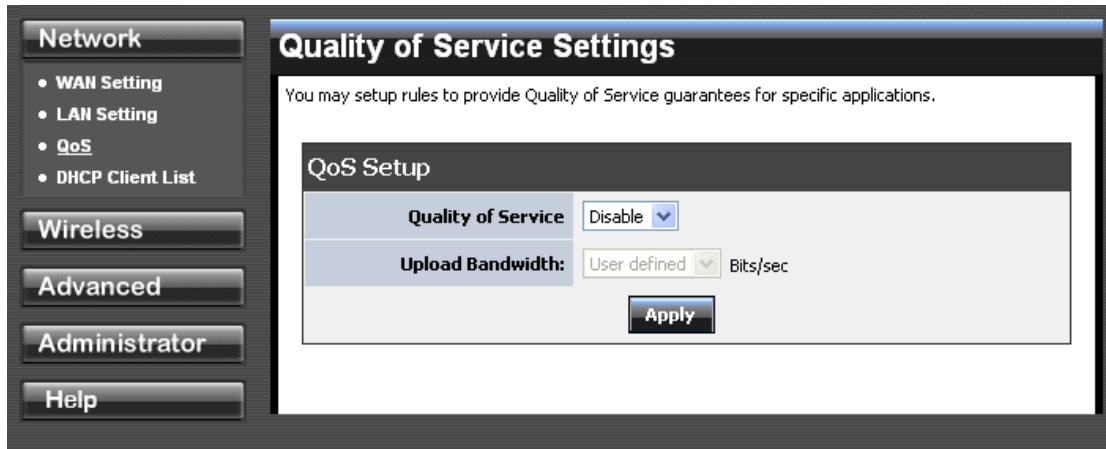
Re-initialize this area of the screen, discarding any changes you have made.

#### **DHCP Reservations List**

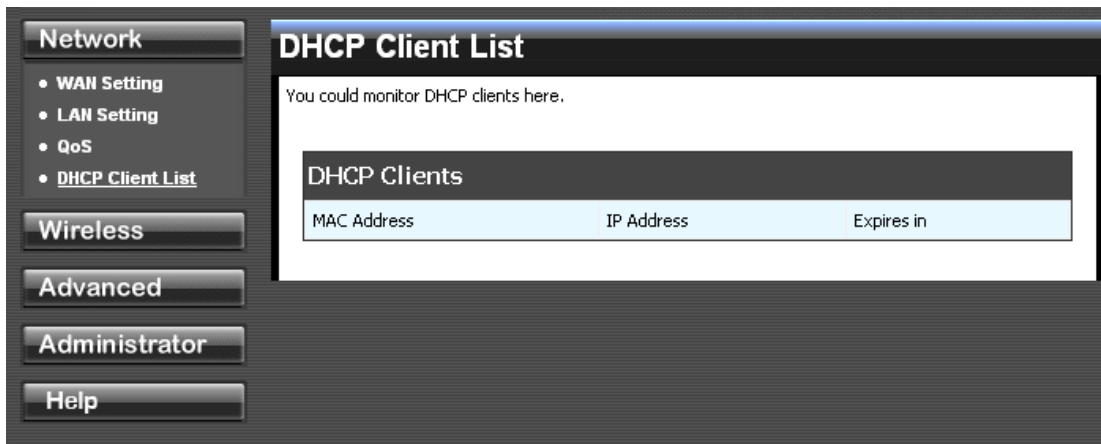
This shows clients that you have specified to reserve DHCP addresses. Click the Enable checkbox at the left to directly activate or de-activate the entry. An entry can be changed by clicking the Edit icon or

can be deleted by clicking the Delete icon. When you click the Edit icon, the item is highlighted, and the "Edit DHCP Reservation" section is activated for editing.

## QoS



## DHCP CLIENT LIST



In this section you can see the connected LAN devices are currently receiving an IP addresses.

# Wireless

## BASIC

**Network**

**Wireless**

- Basic
- Advanced
- Security
- WPS
- Station List

**Advanced**

**Administrator**

**Help**

### Basic Wireless Settings

You could configure the minimum number of Wireless settings for communication, such as Network Name (SSID) and Channel. The Access Point can be set simply with only the minimum setting items.

#### Wireless Network

Wireless Mode	2.4GHz 802.11 b/g/n mixed mode
Wireless Name (SSID)	TRENDnet
Multiple SSID1	
Multiple SSID2	
Multiple SSID3	
Broadcast Network Name (SSID)	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Frequency (Channel)	AutoSelect

#### Wireless Distribution System(WDS)

WDS	Disable
-----	---------

#### HT Physical Mode

Channel BandWidth	<input checked="" type="radio"/> 20MHz <input type="radio"/> Auto 20/40MHz
Guard Interval	<input type="radio"/> long <input checked="" type="radio"/> Auto
MCS	Auto
Extension Channel	AutoSelect

**Apply** **Cancel**

### Radio On/Off

This indicates the wireless operating status. The wireless can be turned on or off by the slide switch. When the radio is on, the following parameters are in effect.

### Wireless Mode

If all of the wireless devices you want to connect with this router can connect in the same transmission mode, you can improve performance slightly by choosing the appropriate wireless mode. If you have some devices that use a different transmission mode, choose the appropriate wireless mode. The TEW-691GR supports 2.4GHz wireless networks. There are many different configuration options available to choose from. Use the drop down list to select the wireless mode.

Note: One wireless mode can be selected can select at any one time. This means that you can only select one of the operating frequency at a time.

### Wireless Mode options

**2.4GHz 802.11b/g mixed mode** - This wireless mode works in the 2.4GHz frequency range and will allow both wireless b and wireless g client to connect and access the TEW-691GR at 11Mbps for wireless b, at 54Mbps for wireless g and share access at the same time. Although the wireless b/g



operates in the 2.4GHz frequency, it will allow the use of other 2.4GHz client devices (Wireless n/g @ 54Mbps) to connect and access at the same time.

**2.4GHz 802.11 n only** – This wireless mode works in the 2.4GHz frequency range and will only allow the use of wireless n client devices to connect and access the TEW-691GR up to 450Mbps\*. Although the wireless n operates in the 2.4GHz frequency, this mode will only permit wireless n client devices to work and will exclude any other wireless mode and devices that are not wireless n only.

**2.4 GHz 802.11b/g/n mixed mode** - This wireless mode works in the 2.4GHz frequency range and will only allow the use of wireless g client devices to connect and access the TEW-691GR at 11Mbps for wireless b, 54Mbps for wireless g and up to 450Mbps\* for wireless n and share access at the same time. Although the wireless b/g/n operates in the same 2.4GHz frequency, it will allow the use of other 2.4GHz client devices (Wireless b/g/n) to connect and access at the same time.

\*Maximum wireless signal rates are referenced from IEEE 802.11 theoretical specifications. Actual data throughput and coverage will vary depending on interference, network traffic, building materials and other conditions.

### **Wireless Network Name (SSID)**

When you are browsing for available wireless networks, this is the name that will appear in the list (unless Visibility Status is set to Invisible, see below). This name is also referred to as the SSID. For security purposes, it is highly recommended to change from the pre-configured network name. Add up to three additional SSIDs to create virtual wireless networks from one wireless Router Access Point device.

### **Add Additional Wireless Network Name (SSID)**

To add additional wireless Network Names simply add the name to the Multiple SSID field and click on apply at the bottom of the page. When finished, go to the Security section in this Users Guide for wireless security configuration.

### **Frequency (Channel)**

A wireless network uses specific channels in the wireless spectrum to handle communication between clients. Some channels in your area may have interference from other electronic devices. Choose the clearest channel to help optimize the performance and coverage of your wireless network.

### **Wireless Distribution System (WDS)**

When WDS is enabled, this access point functions as a wireless repeater and is able to wirelessly communicate with other APs via WDS links. A WDS link is bidirectional; so this AP must know the MAC Address (creates the WDS link) of the other AP, and the other AP must have a WDS link back to this AP. Make sure the APs are configured with same channel.

(Note that WDS security is incompatible with mixed mode, like WPAPSK+WPA2PSK mixed, WEP AUTO and 802.1x, both feature cannot be used at the same time).

### **Configuring WDS with TEW-691GR**

Enable the option for WDS and input the MAC Address of the wireless device that also supports WDS in to the blank fields. You can add up to four additional devices in the spaces provided. Click on apply at the bottom of the page, to apply your setting changes.

Enable the security seeing in security page, each WDS APs need to use same security setting.

(Note: WDS supports wireless g/n modes. The use multiple Access Point will reduces the overall network throughput to ½ the TEW-691GR.

### **HT Physical Mode**

In HT (High Throughput) Physical mode setting allow for control of the 802.11n wireless environment.

### **Operating Mode**

Mixed Mode

Green Field

**Mixed Mode:** In this mode packets are transmitted with a preamble compatible with the legacy 802.11a/g, the rest of the packet has a new format. In this mode the receiver shall be able to decode both the Mixed Mode packets and legacy packets.

**Green Field:** In this mode high throughput packets are transmitted without a legacy compatible part.

### **Channel BandWidth:**

Set channel width of wireless radio.

20/40

20 Channel Width = 20 MHz

20/40 Channel Width = 20/40 MHz

**Guard Interval:**

Support Short/Long GI, the purpose of the guard interval is to introduce immunity to propagation delays, echoes and reflections, to which digital data is normally very sensitive.

Long

Auto

Long Guard Interval, 800 nsec

Short Guard Interval, 400 nsec

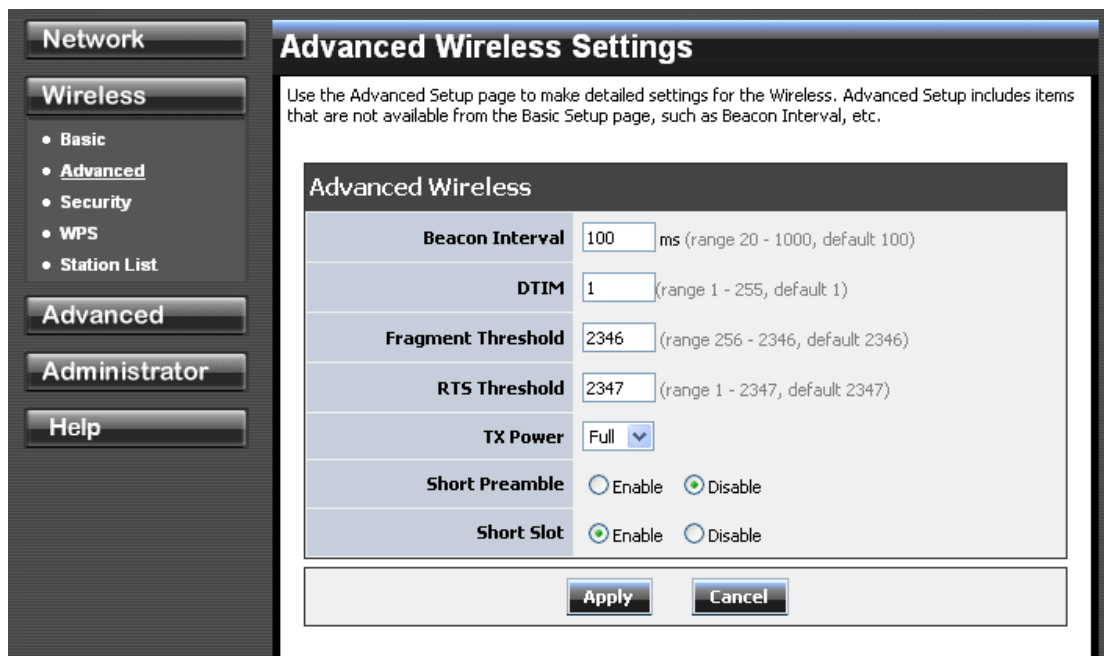
**MCS:**

Fix MCS rate for HT rate.

0-15

The Modulation and Coding Scheme (MCS) is a value that determines the modulation, coding and number of spatial channels.

## ADVANCED



**Beacon Interval**

Beacons are packets sent by a wireless router to synchronize wireless devices. Specify a Beacon Period value between 20 and 1000. The default value is set to 100 milliseconds.

**DTIM**

A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages. When the wireless router has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. Wireless clients detect the beacons and awaken to receive the broadcast and multicast messages. The default value is 1. Valid settings are between 1 and 255.

**Fragmentation Threshold**

Wireless frames can be divided into smaller units (fragments) to improve performance in the presence of RF interference and at the limits of RF coverage. Fragmentation will occur when frame size in bytes is greater than the Fragmentation Threshold. This setting should remain at its default value of 2346 bytes. Setting the Fragmentation value too low may result in poor performance.

**RTS Threshold**

When an excessive number of wireless packet collisions are occurring, wireless performance can be improved by using the RTS/CTS (Request to Send/Clear to Send) handshake protocol. The wireless transmitter will begin to send RTS frames (and wait for CTS) when data frame size in bytes is greater than the RTS Threshold. This setting should remain at its default value of 2346 bytes.

#### Short Preamble and Slot

Using a short (400ns) guard interval can increase throughput. However, it can also increase error rate in some installations, due to increased sensitivity to radio-frequency reflections. Select the option that works best for your installation.

#### TX Burst

Allows the wireless Router to deliver better throughput in the same period and environment in order to increase speed.

#### Pkt\_Aggregate

Increase efficiency by aggregating multiple packets of application data into a single transmission frame. In this way, 802.11n networks can send multiple data packets with the fixed overhead cost of just a single frame.

## SECURITY

The screenshot displays the 'Wireless Security Setting' page. On the left is a navigation menu with options: Network, Wireless (selected), Advanced, Administrator, and Help. Under 'Wireless', there are sub-options: Basic, Advanced, Security (selected), WPS, and Station List. The main content area is titled 'Wireless Security Setting' and contains the following fields:

- Select SSID:** SSID choice dropdown menu set to 'TRENDnet'.
- Security Policy:** Security Mode dropdown menu set to 'WPA2-PSK Mixed'.
- Warning:** A red text box states: 'If you choose WPA/WPA2-TKIP encryption, the wireless mode should be Non-HT 11n mode. This means you will NOT get high throughput performance due to the fact that is not supported by 11N specification.'
- WPA:** WPA Cipher radio button selected for 'TKIP/AES'. Pre-Shared Key text box contains 'e221f0b12dbf79596a65dae5f31'. Key Renewal Interval text box contains '3600' with 'seconds' next to it.
- Wireless MAC Filter:** Filter Mode dropdown menu set to 'Disable'. MAC Address text box is empty, with '(Ex: 00:11:22:33:44:55)' as a hint.
- Buttons:** 'Apply' and 'Cancel' buttons at the bottom.

#### Security Mode

Unless one of these encryption modes is selected, wireless transmissions to and from your wireless network can be easily intercepted and interpreted by unauthorized users.

#### WEP

A method of encrypting data for wireless communication intended to provide the same level of privacy as a wired network. WEP is not as secure as WPA encryption. To gain access to a WEP network, you must know the key. The key is a string of characters that you create. When using WEP, you must determine the level of encryption. The type of encryption determines the key length. 128-bit encryption

requires a longer key than 64-bit encryption. Keys are defined by entering in a string in HEX (hexadecimal - using characters 0-9, A-F) or ASCII (American Standard Code for Information Interchange - alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember. The ASCII string is converted to HEX for use over the network. Four keys can be defined so that you can change keys easily. A default key is selected for use on the network.

Key Length	Hex	ASCII
64-bit	10 characters	5 characters
128-bit	26 characters	13 characters

### **WPA-Personal and WPA-Enterprise**

Both of these options select some variant of Wi-Fi Protected Access (WPA) -- security standards published by the Wi-Fi Alliance. The WPA Mode further refines the variant that the router should employ.

**WPA Mode:** WPA is the older standard; select this option if the clients that will be used with the router only support the older standard. WPA2 is the newer implementation of the stronger IEEE 802.11i security standard. With the "WPA2" option, the router tries WPA2 first, but falls back to WPA if the client only supports WPA. With the "WPA2 Only" option, the router associates only with clients that also support WPA2 security.

**Cipher Type:** The encryption algorithm used to secure the data communication. TKIP (Temporal Key Integrity Protocol) provides per-packet key generation and is based on WEP. AES (Advanced Encryption Standard) is a very secure block based encryption. With the "TKIP and AES" option, the router negotiates the cipher type with the client, and uses AES when available.

**Group Key Update Interval:** The amount of time before the group key used for broadcast and multicast data is changed.

#### **WPA-Personal**

This option uses Wi-Fi Protected Access with a Pre-Shared Key (PSK).

**Pre-Shared Key:** The key is entered as a pass-phrase of up to 63 alphanumeric characters in ASCII (American Standard Code for Information Interchange) format at both ends of the wireless connection. It cannot be shorter than eight characters, although for proper security it needs to be of ample length and should not be a commonly known phrase. This phrase is used to generate session keys that are unique for each wireless client.

#### **WPA-Enterprise**

This option works with a RADIUS Server to authenticate wireless clients. Wireless clients should have established the necessary credentials before attempting to authenticate to the Server through this Gateway. Furthermore, it may be necessary to configure the RADIUS Server to allow this Gateway to authenticate users.

**Authentication Timeout:** Amount of time before a client will be required to re-authenticate.

**RADIUS Server IP Address:** The IP address of the authentication server.

**RADIUS Server Port:** The port number used to connect to the authentication server.

**RADIUS Server Shared Secret:** A pass-phrase that must match with the authentication server.

#### **WPA/WPA2 mixed environment**

For those WPA2 stations, they will use AES for unicast. For those WPA stations, they will use TKIP for unicast. But for multicast all WPA and WPA2 stations have to use the same key, and that will be TKIP, because WPA station only knows about TKIP, WPA2 is new standard, so it is defined to backward support TKIP on multicast.

### **Wireless MAC Filtering**

Choose the type of MAC filtering needed.

**Turn MAC Filtering Disable:** When "Disable" is selected, MAC addresses are not used to control network access.

#### **Add MAC Filtering Rule**

Use this section to add MAC addresses to the list below.

## MAC Address

Enter the MAC address of a computer that you want to control with MAC filtering. Computers that have obtained an IP address from the router's DHCP server will be in the DHCP Client List. Select a device from the drop down menu.

*The rule of thumb: In mixed mode, multicast key has to be TKIP, but unicast key can be different per stations. In WPA or WPA2 only mode, unicast and multicast key can be only AES for WPA2, and TKIP for WPA. (AES means the unicast and multicast key are all AES. TKIP/AES means multicast is TKIP. But unicast can be AES or TKIP, which depends on the peer.)*

## WPS

**Network**

**Wireless**

- Basic
- Advanced
- Security
- **WPS**
- Station List

**Advanced**

**Administrator**

**Help**

### Wi-Fi Protected Setup

You could setup security easily by choosing PIN or PBC method to do Wi-Fi Protected Setup.

#### WPS Config

<b>WPS</b>	Enable <input type="button" value="v"/>
------------	---

#### WPS Summary

<b>WPS Current Status</b>	Idle
<b>WPS Configured</b>	Yes
<b>WPS SSID</b>	TRENDnet
<b>WPS Security Mode</b>	WPA-PSKWPA2-PSK
<b>WPS Encryp Type</b>	TKIPAES
<b>WPS Key(ASCII)</b>	e221f0b12dbf79596a65dae5f3197c12 9e2c92a9766366d10807d713325d1040
<b>AP PIN</b>	00677202

#### WPS Action

Please click Wireless Client Card and Router's WPS button in 120 seconds to complete this setting.

<b>PIN</b>	<input type="text"/>	<input type="button" value="Configure via PIN"/>
<b>PBC</b>		<input type="button" value="Configure via PBC"/>

## Enable

Enable the WPS feature.

## Lock Wireless Security Settings

Locking the wireless security settings prevents the settings from being changed by any new external registrar using its PIN. Devices can still be added to the wireless network using WPS.

## PIN Settings

A PIN is a unique number that can be used to add the router to an existing network or to create a new network. The default PIN may be printed on the bottom of the router. For extra security, a new PIN can be generated. You can restore the default PIN at any time. Only the Administrator ("admin" account) can change or reset the PIN.

## Current PIN

Shows the current value of the router's PIN.

## Reset To WPS Default

Restore the default PIN of the router.

## Generate New PIN

Create a random number that is a valid PIN. This becomes the router's PIN. You can then copy this PIN to the user interface of the registrar.

## PBC Settings

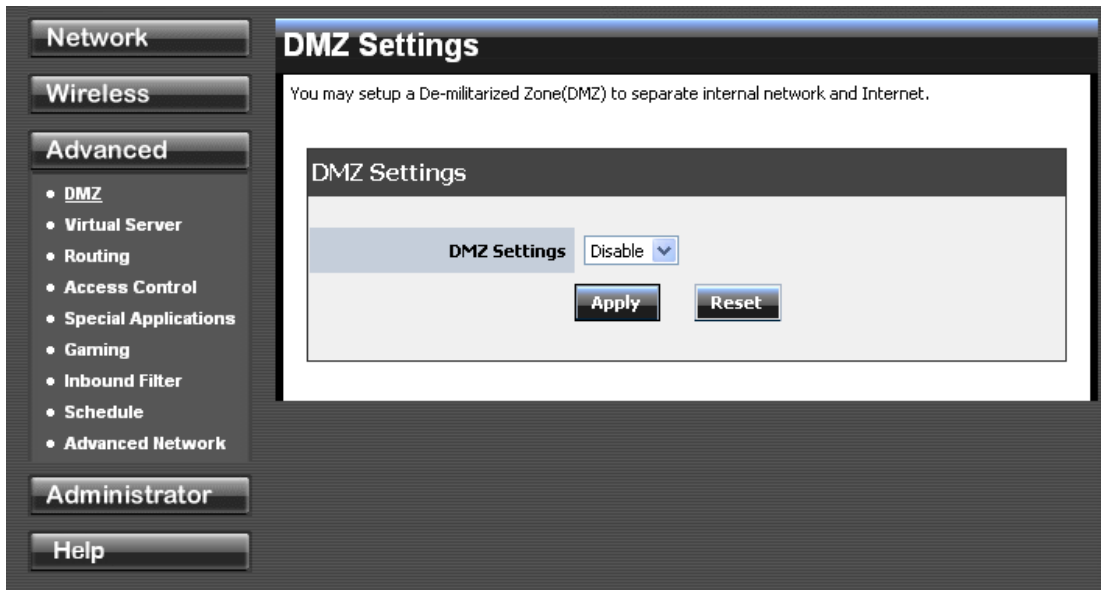
The push button method can be used to allow wireless clients to connect to the router without entering/remember any encryption keys. The user can use the PBC method by pressing the WPS button on the side of the router or select the PBC option under Wireless/WPS settings page and hit Apply.

## STATION LIST

Wireless Network			
MAC Address	Mode	Rate	Signal

All the wireless clients connecting to the router will be shown here, you could monitor your network and prevent any unauthorized wireless connection easily.

# Advanced DMZ



## DMZ Setting

DMZ means "Demilitarized Zone." If an application has trouble working from behind the router, you can expose one computer to the Internet and run the application on that computer.

When a LAN host is configured as a DMZ host, it becomes the destination for all incoming packets that do not match some other incoming session or rule. If any other ingress rule is in place, that will be used instead of sending packets to the DMZ host; so, an active session, virtual server, active port trigger, or port forwarding rule will take priority over sending a packet to the DMZ host. (The DMZ policy resembles a default port forwarding rule that forwards every port that is not specifically sent anywhere else.)

The router provides only limited firewall protection for the DMZ host. The router does not forward a TCP packet that does not match an active DMZ session, unless it is a connection establishment packet (SYN). Except for this limited protection, the DMZ host is effectively "outside the firewall". Anyone considering using a DMZ host should also consider running a firewall on that DMZ host system to provide additional protection.

Packets received by the DMZ host have their IP addresses translated from the WAN-side IP address of the router to the LAN-side IP address of the DMZ host. However, port numbers are not translated; so applications on the DMZ host can depend on specific port numbers.

The DMZ capability is just one of several means for allowing incoming requests that might appear unsolicited to the NAT. In general, the DMZ host should be used only if there are no other alternatives, because it is much more exposed to cyberattacks than any other system on the LAN. Thought should be given to using other configurations instead: a virtual server, a port forwarding rule, or a port trigger. Virtual servers open one port for incoming sessions bound for a specific application (and also allow port redirection and the use of ALGs).

Port forwarding is rather like a selective DMZ, where incoming traffic targeted at one or more ports is forwarded to a specific LAN host (thereby not exposing as many ports as a DMZ host). Port triggering is a special form of port forwarding, which is activated by outgoing traffic, and for which ports are only forwarded while the trigger is active.

Few applications truly require the use of the DMZ host. Following are examples of when a

### **DMZ host might be required:**

- A host needs to support several applications that might use overlapping ingress ports such that two port forwarding rules cannot be used because they would potentially be in conflict.

- To handle incoming connections that use a protocol other than ICMP, TCP, UDP, and IGMP (also GRE and ESP, when these protocols are enabled by the PPTP and IPsec)

### Enable DMZ

Putting a computer in the DMZ may expose that computer to a variety of security risks. Use of this option is only recommended as a last resort.

### DMZ IP Address

Specify the LAN IP address of the LAN computer that you want to have unrestricted Internet communication.

## VIRTUAL SERVER

The Virtual Server can define a single public port for redirection to an internal IP and port.

**Add Virtual Server**

Rule Enable

Rule Name

IP Address

Protocol TCP

Public Port

Private Port

Inbound Filter Allow All

Schedule Always

**Virtual Server List**

Enable	Rule Name	IP Address	Protocol, Public Port/Private Port	Inbound Filter	Schedule	Edit	Delete

### Enable

Specifies whether the entry will be active or inactive.

### Name

Assign a meaningful name to the virtual server, for example **Web Server**. Several well-known types of virtual server are available from the "Application Name" drop-down list. Selecting one of these entries fills some of the remaining parameters with standard values for that type of server.

### IP Address

The IP address of the system on your internal network that will provide the virtual service, for example **192.168.10.50**. You can select a computer from the list of DHCP clients in the "Computer Name" drop-down menu, or you can manually enter the IP address of the server computer.

### Protocol

Select the protocol used by the service. The common choices -- UDP, TCP, and both UDP and TCP -- can be selected from the drop-down menu. To specify any other protocol, select "Other" from the list, then enter the corresponding protocol number (as assigned by the IANA) in the **Protocol** box.

### Private Port



The port that will be used on your internal network.

**Public Port**

The port that will be accessed from the Internet.

**Schedule**

Select a schedule for when the service will be enabled. If you do not see the schedule you need in the list of schedules.

**Clear**

Re-initialize this area of the screen, discarding any changes you have made.

## ROUTING

**Static Routing Settings**

The Static Routing option allows you to define fixed routes to specific destinations.

**Add Static Route**

Destination IP Address :

Destination IP Netmask :

Gateway :

Metric :

Interface :

**Static Route List**

No.	IP	Netmask	Gateway	Metric	Interface
-----	----	---------	---------	--------	-----------

**Routing Table**

IP	Netmask	Gateway	Metric	Interface
255.255.255.255	255.255.255.255	0.0.0.0	0	LAN/WLAN
239.255.255.250	255.255.255.255	0.0.0.0	0	LAN/WLAN
192.168.10.0	255.255.255.0	0.0.0.0	0	LAN/WLAN
239.0.0.0	255.0.0.0	0.0.0.0	0	LAN/WLAN
224.0.0.0	240.0.0.0	0.0.0.0	0	LAN/WLAN

**Add/Edit Route**

Adds a new route to the IP routing table or edits an existing route.

**Destination IP**

The IP address of packets that will take this route.

**Gateway**

Specifies the next hop to be taken if this route is used. A gateway of 0.0.0.0 implies there is no next hop, and the IP address matched is directly connected to the router on the interface specified: LAN or WAN.

**Metric**

The route metric is a value from 1 to 16 that indicates the cost of using this route. A value of 1 is the lowest cost, and 15 is the highest cost. A value of 16 indicates that the route is not reachable from this

router. When trying to reach a particular destination, computers on your network will select the best route, ignoring unreachable routes.

### Interface

Specifies the interface -- LAN or WAN -- that the IP packet must use to transit out of the router, when this route is used.

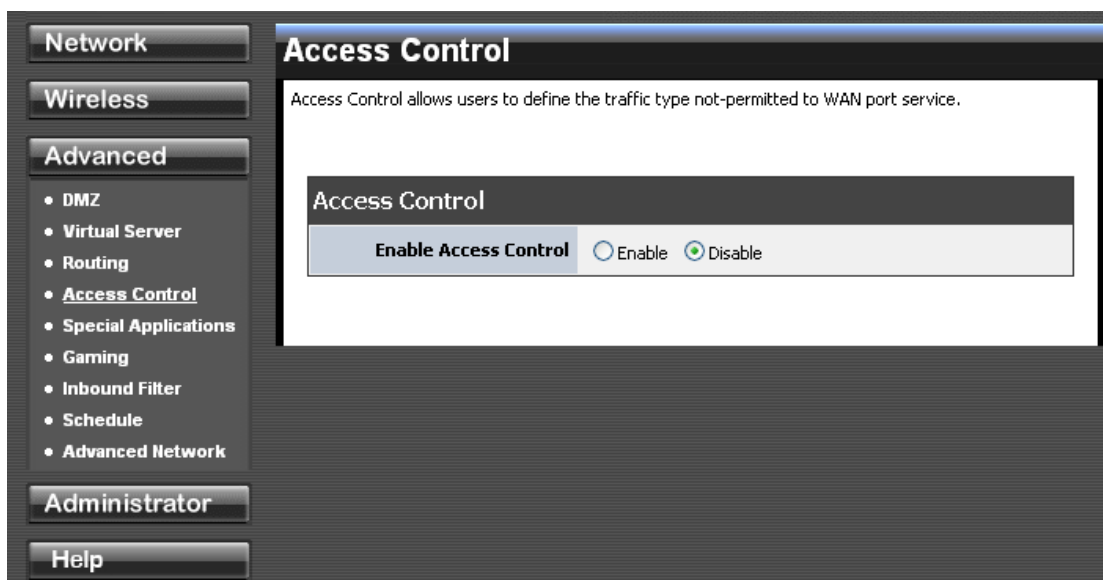
### Clear

Re-initialize this area of the screen, discarding any changes you have made.

### Routes List

The section shows the current routing table entries. Certain required routes are predefined and cannot be changed. Routes that you add can be changed by clicking the Edit icon or can be deleted by clicking the Delete icon. When you click the Edit icon, the item is highlighted, and the "Edit Route" section is activated for editing. Click the Enable checkbox at the left to directly activate or de-activate the entry.

## ACCESS CONTROL



### Enable

By default, the Access Control feature is disabled. If you need Access Control, check this option.

**Note:** When Access Control is disabled, every device on the LAN has unrestricted access to the Internet. However, if you enable Access Control, Internet access is restricted for those devices that have an Access Control Policy configured for them. All other devices have unrestricted access to the Internet.

# SPECIAL APPLICATIONS

**Network**

**Wireless**

**Advanced**

- DMZ
- Virtual Server
- Routing
- Access Control
- **Special Applications**
- Gaming
- Inbound Filter
- Schedule
- Advanced Network

**Administrator**

**Help**

## Port Trigger

Port trigger is a way to automate port forwarding in which outbound traffic on predetermined ports ("triggering ports") causes inbound traffic to specific incoming ports to be dynamically forwarded to the initiating host, while the outbound ports are in use.  
Please assign the port with below format:  
1. Single Port (ex: 80)  
2. Port Ranges (ex: 50-60)

### Port Trigger Function

**Port Triggering** Enable

### Add Port Trigger Rule

**Rule Enable**

**Rule Name**

**Match Protocol** TCP

**Match Port**

**Trigger Protocol** TCP

**Trigger Port**

**Schedule** Always

### Port Trigger Rule List

Enable	Rule Name	Match Port Protocol/Ports	Trigger Port Protocol/Ports	Schedule	Edit	Delete
--------	-----------	---------------------------	-----------------------------	----------	------	--------

## Add/Edit Port Trigger Rule

**Enable**

Specifies whether the entry will be active or inactive.

**Name**

Enter a name for the Special Application Rule, for example **Game App**, which will help you identify the rule in the future. Alternatively, you can select from the **Application** list of common applications.

**Protocol**

Select the protocol used by the service. The common choices -- UDP, TCP, and both UDP and TCP -- can be selected from the drop-down menu.

**Trigger Port**

Enter the outgoing port range used by your application (for example **6500-6700**).

**Schedule**

Select a schedule for when this rule is in effect.

**Clear**

Re-initialize this area of the screen, discarding any changes you have made.

Port Trigger Rule List

This is a list of the defined application rules. Click the Enable checkbox at the left to directly activate or de-activate the entry. An entry can be changed by clicking the Edit icon or can be deleted by clicking the Delete icon.

## GAMING

### Add/Edit Port Range Rule

Use this section to add a Port Range Rule to the following list or to edit a rule already in the list.

#### Rule Enable

Specifies whether the entry will be active or inactive.

#### Rule Name

Give the rule a name that is meaningful to you, for example **Game Server**. You can also select from a list of popular games, and many of the remaining configuration values will be filled in accordingly. However, you should check whether the port values have changed since this list was created, and you must fill in the IP address field.

#### IP Address

Enter the local network IP address of the system hosting the server, for example **192.168.10.50**. You can select a computer from the list of DHCP clients in the "Computer Name" drop-down menu, or you can manually enter the IP address of the server computer.

#### TCP Ports to Open

Enter the TCP ports to open (for example **6159-6180, 99**).

#### UDP Ports to Open

Enter the UDP ports to open (for example **6159-6180, 99**).

#### Inbound Filter

Select a filter that controls access as needed for this rule.

#### Schedule

Select a schedule for the times when this rule is in effect.

## Clear

Re-initialize this area of the screen, discarding any changes you have made.

## Port Range Rule List

This is a list of the defined Port Range Rules. Click the Enable checkbox at the left to directly activate or de-activate the entry. An entry can be changed by clicking the Edit icon or can be deleted by clicking the Delete icon. When you click the Edit icon, the item is highlighted, and the "Edit Port Forwarding Rule" section is activated for editing.

## INBOUND FILTER

The Inbound Filter controlling data received from the Internet. In this feature you can configure inbound data filtering rules that control data based on an IP address.

**Add Inbound Filter Rule**

Rule Name:

Rule Action:  Allow  Deny

IP Address:

**Inbound Filter Rule List**

Rule Name	RuleAction	IP Address	Edit	Delete
-----------	------------	------------	------	--------

### Add/Edit Inbound Filter Rule

Here you can add entries to the Inbound Filter Rules List below, or edit existing entries.

#### Name

Enter a name for the rule that is meaningful to you.

#### Action

The rule can either Allow or Deny messages.

#### Remote IP Range

Define the ranges of Internet addresses this rule applies to. For a single IP address, enter the same address in both the **Start** and **End** boxes. Up to eight ranges can be entered. The **Enable** checkbox allows you to turn on or off specific entries in the list of ranges.

#### Clear

Re-initialize this area of the screen, discarding any changes you have made.

### Inbound Filter Rules List

The section lists the current Inbound Filter Rules. An entry can be changed by clicking the Edit icon or can be deleted by clicking the Delete icon. When you click the Edit icon, the item is highlighted, and the "Edit Inbound Filter Rule" section is activated for editing.

In addition to the filters listed here, two predefined filters are available wherever inbound filters can be applied:

#### Allow All

Permit any WAN user to access the related capability.

## Deny All

Prevent all WAN users from accessing the related capability. (LAN users are not affected by Inbound Filter Rules.)

## SCHEDULE

**Network**

**Wireless**

**Advanced**

- DMZ
- Virtual Server
- Routing
- Access Control
- Special Applications
- Gaming
- Inbound Filter
- **Schedule**
- Advanced Network

**Administrator**

**Help**

### Schedule Rules

Define schedule rules for various firewall features.

#### Add Schedule Rule

**Rule Name**

**Day(s)**  Select Day(s)  All Week

Sun  Mon  Tue  Wed  Thu  Fri  Sat

**All Day - 24hrs**

**Start Time** 00 : 00

**End Time** 00 : 00

**Add** **Clear**

#### Schedule Rule List

Rule Name	Day(s)	Time stamp	Edit	Delete
-----------	--------	------------	------	--------

### Add/Edit Schedule Rule

In this section you can add entries to the Schedule Rules List below or edit existing entries.

#### Name

Give the schedule a name that is meaningful to you, such as "Weekday rule".

#### Day(s)

Place a checkmark in the boxes for the desired days or select the All Week radio button to select all seven days of the week.

#### All Day - 24 hrs

Select this option if you want this schedule in effect all day for the selected day(s).

#### Start Time

If you don't use the All Day option, then you enter the time here. The start time is entered in two fields. The first box is for the hour and the second box is for the minute. Email events are normally triggered only by the start time. End Time

The end time is entered in the same format as the start time. The hour in the first box and the minutes in the second box. The end time is used for most other rules, but is not normally used for email events.

#### Clear

Re-initialize this area of the screen, discarding any changes you have made.

#### Schedule Rules List

This section shows the currently defined Schedule Rules. An entry can be changed by clicking the Edit icon or can be deleted by clicking the Delete icon. When you click the Edit icon, the item is highlighted, and the "Edit Schedule Rule" section is activated for editing.

# ADVANCED NETWORK

The screenshot shows a web interface for configuring network settings. On the left is a sidebar with navigation buttons: Network, Wireless, Advanced, Administrator, and Help. The 'Advanced' section is expanded to show a list of sub-options: DMZ, Virtual Server, Routing, Access Control, Special Applications, Gaming, Inbound Filter, Schedule, and Advanced Network. The main content area is titled 'Advanced Network' and contains a warning message: 'If you are not familiar with these Advanced Network settings, please read the help section before attempting to modify these settings.' Below the warning are two settings sections: 'UPnP' with a dropdown menu set to 'Enable', and 'WAN Ping' with a dropdown menu set to 'Disable'. At the bottom of the settings area are 'Apply' and 'Reset' buttons.

**Network**

**Wireless**

**Advanced**

- DMZ
- Virtual Server
- Routing
- Access Control
- Special Applications
- Gaming
- Inbound Filter
- Schedule
- **Advanced Network**

**Administrator**

**Help**

## Advanced Network

If you are not familiar with these Advanced Network settings, please read the help section before attempting to modify these settings.

**UPnP**

UPnP

**WAN Ping**

WAN Ping Respond

# Administrator MANAGEMENT

The screenshot displays the 'System Management' web interface. On the left is a navigation sidebar with buttons for 'Network', 'Wireless', 'Advanced', 'Administrator', and 'Help'. The 'Administrator' section is expanded, showing sub-items: 'Management', 'Upload Firmware', 'Settings Management', 'Time', and 'Status'. The main content area is titled 'System Management' and contains a sub-header 'Administrator Settings' with the text 'You may configure administrator account and password.' Below this are three rows of settings: 'Account' (text input with 'admin'), 'Password' (text input with a red note '(Max Length: 16 characters)'), and 'Idle Timeout' (text input with '300' and '(120-3600 seconds)'). Each row has 'Apply' and 'Cancel' buttons. The next section is 'Device Name Settings' with a 'Device Name' text input containing 'TRENDnet' and 'Apply'/'Cancel' buttons. The 'DDNS Settings' section includes a 'Dynamic DNS Provider' dropdown menu (set to 'None'), and text inputs for 'Host Name', 'Account', and 'Password', with 'Apply'/'Cancel' buttons. The final section is 'Remote Management' with a 'Remote Control (via WAN)' dropdown menu (set to 'Disable') and a 'Remote Port' text input containing '8080', with 'Apply'/'Reset' buttons.

## Admin Password

Enter a password for the user "admin", who will have full access to the Web-based management interface.

## Device Name

The name of the router can be changed here.

## Enable Dynamic DNS

Enable this option only if you have purchased your own domain name and registered with a dynamic DNS service provider. The following parameters are displayed when the option is enabled.

### Dynamic DNS Provider

Select a dynamic DNS service provider from the pull-down list.

### Host Name

Enter your host name, fully qualified; for example: **myhost.mydomain.net**.



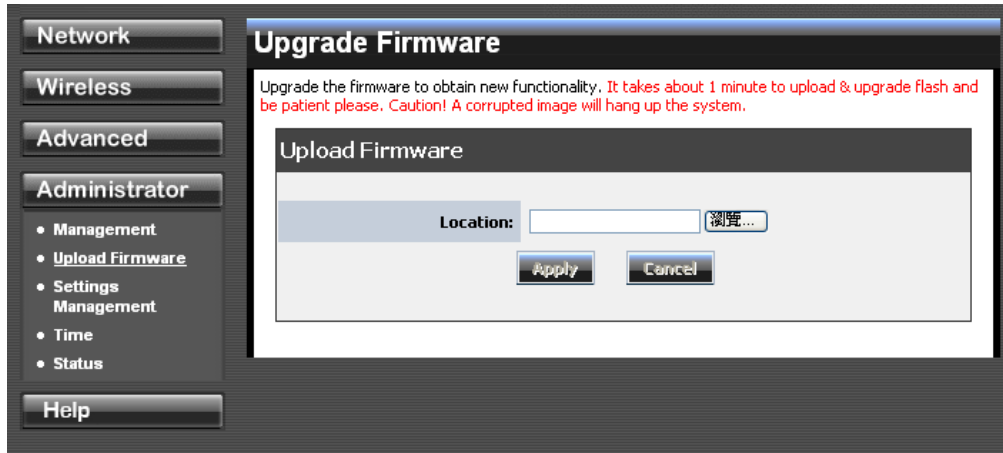
## Account

Enter the account provided by your service provider. If the Dynamic DNS provider supplies only a key, enter that key in all three fields.

## Password

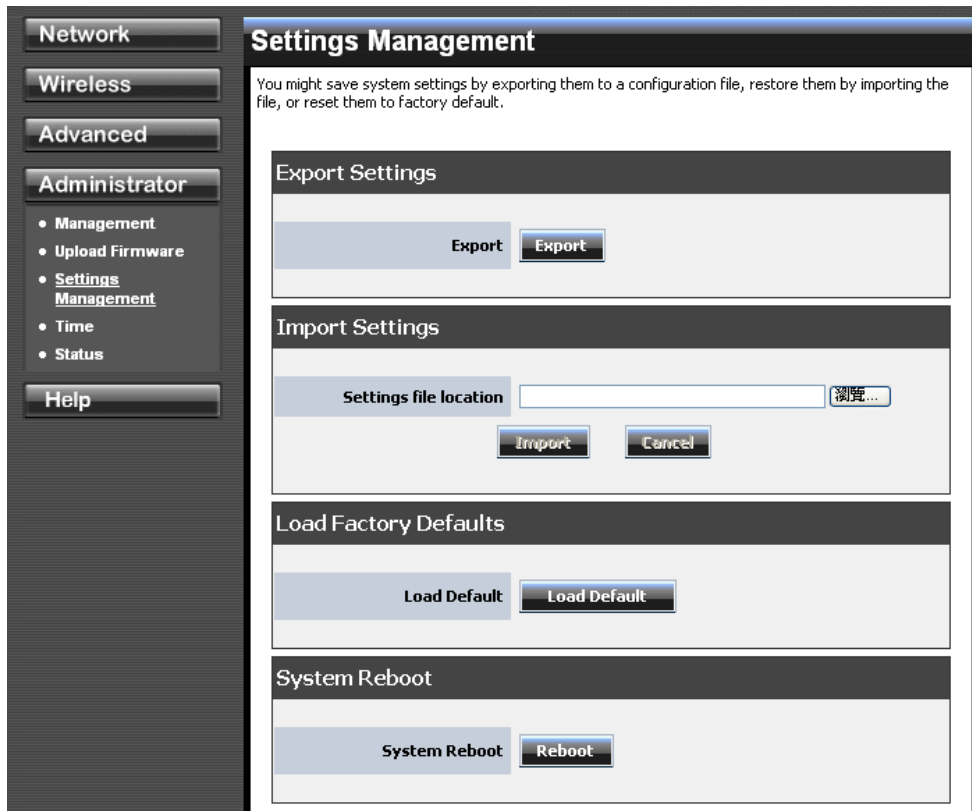
Enter the password provided by your service provider. If the Dynamic DNS provider supplies only a key, enter that key in all three fields.

## UPLOAD FIRMWARE



Once you have a firmware update on your computer, use this option to browse for the file and then upload the information into the router.

## SETTING MANAGEMENT



## Export Settings

This option allows you to export and then save the router's configuration to a file on your computer. Be sure to save the configuration before performing a firmware upgrade.

## Import Settings

Use this option to restore previously saved router configuration settings.

## Load Factory Defaults

This option restores all configuration settings back to the settings that were in effect at the time the router was shipped from the factory. Any settings that have not been saved will be lost. If you want to save your router configuration settings, use the **Export Settings** option above.

## System Reboot

This restarts the router. It is useful for restarting when you are not near the device.

## TIME

The screenshot shows a web interface for configuring the router's time. On the left is a navigation menu with options: Network, Wireless, Advanced, Administrator (with sub-options: Management, Upload Firmware, Settings Management, Time, Status), and Help. The main content area is titled "Time Setting" and contains the following sections:

- Time Configuration**: Shows "System Time" as "Sat Jan 1 07:37:32 2000".
- NTP Settings**: Includes an "Enable NTP Server" checkbox, which is currently unchecked.
- Date and Time Settings**: A "Date And Time" section with dropdown menus for Year (2000), Month (Jan), Day (01), Hour (07), Minute (37), and Second (31).

At the bottom of the configuration area are "Apply" and "Cancel" buttons.

### Time Configuration

#### Current Router Time

Displays the time currently maintained by the router. If this is not correct, use the following options to configure the time correctly.

#### Time Zone

Select your local time zone from pull down menu.

Automatic Time Configuration

#### Enable NTP Server

Select this option if you want to synchronize the router's clock to a Network Time Server over the Internet. If you are using schedules or logs, this is the best way to ensure that the schedules and logs are kept accurate. Note that, even when NTP Server is enabled, you must still choose a time zone and set the daylight saving parameters.

#### NTP Server Used

Select a Network Time Server for synchronization. You can type in the address of a time server or select one from the list. If you have trouble using one server, select another.

Set the Date and Time Manually

If you do not have the NTP Server option in effect, you can either manually set the time for your router here.

# STATUS

**Network**

**Wireless**

**Advanced**

**Administrator**

- Management
- Upload Firmware
- Settings Management
- Time
- **Status**

**Help**

## Status

The device status.

### System Info

<b>Firmware Version</b>	2.0.0.3, 15-Mar-2010
<b>System Time</b>	Sat Jan 1 07:37:55 2000
<b>System Up Time</b>	07:37:56

### Internet Configurations

<b>Connected Type</b>	DHCP Client
<b>WAN IP Address</b>	0.0.0.0
<b>Subnet Mask</b>	0.0.0.0
<b>Default Gateway</b>	0.0.0.0
<b>Primary Domain Name Server</b>	0.0.0.0
<b>Secondary Domain Name Server</b>	0.0.0.0

### LAN

<b>MAC Address</b>	00:11:E0:01:08:88
<b>IP Address</b>	192.168.10.1
<b>Subnet Mask</b>	255.255.255.0

### Wireless LAN

<b>Wireless Radio</b>	Radio On
<b>MAC Address</b>	00:11:E0:01:08:88
<b>Channel</b>	10
<b>Network Name (SSID) / Security Mode</b>	TRENDnet / WPA2-PSK Mixed
<b>Multiple SSID1 / Security Mode</b>	
<b>Multiple SSID2 / Security Mode</b>	
<b>Multiple SSID3 / Security Mode</b>	

# Help

**Network**

**Wireless**

**Advanced**

**Administrator**

**Help**

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**Help menu**

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**Wireless Help**

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**Advanced Help**

- [DMZ](#)
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**Administrator Help**

- [Management](#)
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Help section provides web-based explanations on each configurable field.

# Network Glossary

**Access Point** - A device that allows wireless-equipped computers and other devices to communicate with a wired network. also used to expand the range of a wireless network.

**Ad-hoc** - A group of wireless devices communicating directly with each other (peer-to-peer) without the use of an access point.

**AES (Advanced Encryption Standard)** - A security method that uses symmetric 128-bit block data encryption.

**Bandwidth** - The transmission capacity of a given device or network.

**Bit** - A binary digit.

**Boot** - To start a device and cause it to start executing instructions.

**Broadband** - An always-on, fast Internet connection.

**Browser** - An application program that provides a way to look at and interact with all the information on the World Wide Web.

**Cable Modem** - A device that connects a computer to the cable television network, which in turn connects to the Internet.

**Daisy Chain** - A method used to connect devices in a series, one after the other.

**DDNS (Dynamic Domain Name System)** - Allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (e.g., www.xyz.com) and a dynamic IP address.

**Default Gateway** - A device that forwards Internet traffic from your local area network.

**DHCP (Dynamic Host Configuration Protocol)** - A networking protocol that allows administrators to assign temporary IP addresses to network computers by "leasing" an IP address to a user for a limited amount of time, instead of assigning permanent IP addresses.

**DMZ (Demilitarized Zone)** - Removes the Router's firewall protection from one PC, allowing it to be "seen" from the Internet.

**DNS (Domain Name Server)** - The IP address of your ISP's server, which translates the names of websites into IP addresses.

**Domain** - A specific name for a network of computers.

**Download** - To receive a file transmitted over a network.

**DSL (Digital Subscriber Line)** - An always-on broadband connection over traditional phone lines.

**Dynamic IP Address** - A temporary IP address assigned by a DHCP server.

**EAP (Extensible Authentication Protocol)** - A general authentication protocol used to control network access. Many specific authentication methods work within this framework.

**Encryption** - Encoding data transmitted in a network.

**Ethernet** - IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium.

**Firewall** - A set of related programs located at a network gateway server that protects the resources of a network from users from other networks.

**Firmware** - The programming code that runs a networking device.

**FTP (File Transfer Protocol)** - A protocol used to transfer files over a TCP/IP network.

**Full Duplex** - The ability of a networking device to receive and transmit data simultaneously.

**Gateway** - A device that interconnects networks with different, incompatible communications protocols.

**Half Duplex** - Data transmission that can occur in two directions over a single line, but only one direction at a time.

**HTTP (HyperText Transport Protocol)** - The communications protocol used to connect to servers on the World Wide Web.

**Infrastructure** - A wireless network that is bridged to a wired network via an access point.

**IP (Internet Protocol)** - A protocol used to send data over a network

**IP Address** - The address used to identify a computer or device on a network.

**IPCONFIG** - A Windows 2000 and XP utility that displays the IP address for a particular networking device.

**IPSec (Internet Protocol Security)** - A VPN protocol used to implement secure exchange of packets at the IP layer.

**ISP (Internet Service Provider)** - A company that provides access to the Internet.

**LAN** - The computers and networking products that make up your local network.

**MAC (Media Access Control) Address** - The unique address that a manufacturer assigns to each networking device.

**Mbps (MegaBits Per Second)** - One million bits per second; a unit of measurement for data transmission.

**NAT (Network Address Translation)** - NAT technology translates IP addresses of a local area network to a different IP address for the Internet.

**Packet** - A unit of data sent over a network.

**Passphrase** - Used much like a password, a passphrase simplifies the WEP encryption process by automatically generating the WEP encryption keys for Linksys products.

**Ping (Packet Internet Groper)** - An Internet utility used to determine whether a particular IP address is online.

**POP3 (Post Office Protocol 3)** - A standard mail server commonly used on the Internet.

**Port** - The connection point on a computer or networking device used for plugging in cables or adapters.

**Power over Ethernet (PoE)** - A technology enabling an Ethernet network cable to deliver both data and power.

**PPPoE (Point to Point Protocol over Ethernet)** - A type of broadband connection that provides authentication (username and password) in addition to data transport.

**PPTP (Point-to-Point Tunneling Protocol)** - A VPN protocol that allows the Point to Point Protocol (PPP) to be tunneled through an IP network. This protocol is also used as a type of broadband connection in Europe.

**RADIUS (Remote Authentication Dial-In User Service)** - A protocol that uses an authentication server to control network access.

**RJ-45 (Registered Jack-45)** - An Ethernet connector that holds up to eight wires.

**Roaming** - The ability to take a wireless device from one access point's range to another without losing the connection.

**Router** - A networking device that connects multiple networks together.

**Server** - Any computer whose function in a network is to provide user access to files, printing, communications, and other services.

**SMTP (Simple Mail Transfer Protocol)** - The standard e-mail protocol on the Internet.

**SNMP (Simple Network Management Protocol)** - A widely used network monitoring and control protocol.

**SPI (Stateful Packet Inspection) Firewall** - A technology that inspects incoming packets of information before allowing them to enter the network.

**SSID (Service Set Identifier)** - Wireless network's name.

**Static IP Address** - A fixed assigned address to a computer or device that is connected to a network.

**Static Routing** - Forwarding data in a network via a fixed path.

**Subnet Mask** - An address code that determines the size of the network.

**Switch** - 1. A data switch that connects computing devices to host computers, allowing a large number of devices to share a limited number of ports. 2. A device for making, breaking, or changing the connections in an electrical circuit.

**TCP (Transmission Control Protocol)** - A network protocol for transmitting data that requires acknowledgement from the recipient of data sent.

**TCP/IP (Transmission Control Protocol/Internet Protocol)** - A set of instructions PCs use to communicate over a network.

**Telnet** - A user command and TCP/IP protocol used for accessing remote PCs.

**TFTP (Trivial File Transfer Protocol)** - A version of the TCP/IP FTP protocol that has no directory or password capability.

**Throughput** - The amount of data moved successfully from one node to another in a given time period.

**TKIP (Temporal Key Integrity Protocol)** - a wireless encryption protocol that provides dynamic encryption keys for each packet transmitted.

**Topology** - The physical layout of a network.

**TX Rate** - Transmission Rate.

**Upgrade** - To replace existing software or firmware with a newer version.

**Upload** - To transmit a file over a network.

**URL (Uniform Resource Locator)** - The address of a file located on the Internet.

**VPN (Virtual Private Network)** - A security measure to protect data as it leaves one network and goes to another over the Internet.

**WAN (Wide Area Network)**- The Internet.

**WEP (Wired Equivalent Privacy)** - A method of encrypting network data transmitted on a wireless network for greater security.

**WLAN (Wireless Local Area Network)** - A group of computers and associated devices that communicate with each other wirelessly.

**WPA (Wi-Fi Protected Access)** - a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.



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