ProSAFE Single Band 802.11n Wireless Access Point WN203

Reference Manual

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Support

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Introduction

1

This chapter introduces the NETGEAR® ProSAFE® Single Band 802.11n Wireless Access Point WN203, and describes some of the key features. The chapter includes the following sections:

- *About the ProSAFE Single Band 802.11n Wireless Access Point WN203*
- *What Is in the Box?*
- *System Requirements*
- *Key Features and Standards*
- *Hardware Description*

Note: For more information about the topics covered in this manual, visit the support website at *support.netgear.com*.

Note: Firmware updates with new features and bug fixes are made available from time to time at *downloadcenter.netgear.com*. Some products can regularly check the site and download new firmware, or you can check for and download new firmware manually. If the features or behavior of your product do not match what is described in this guide, you might need to update your firmware.

About the ProSAFE Single Band 802.11n Wireless Access Point WN203

The ProSAFE Single Band 802.11n Wireless Access Point WN203, going forward in this manual referred to as the wireless access point, is a solid building block of a wireless LAN infrastructure. It provides 2.4 GHz 802.11b/g/n connectivity between wired Ethernet networks and radio-equipped wireless notebook systems, desktop systems, print servers, and other devices. Support for two transmit radio chains and two receive radio chains, also referred to as 2x2 multiple input, multiple output (MIMO), can increase wireless throughput considerably.

The wireless access point provides wireless connectivity to multiple wireless network devices within a fixed range or area of coverage. Typically, an individual in-building wireless access point provides a maximum connectivity area with about a 500-foot radius. The wireless access point can support a maximum of 64 clients in a range of several hundred feet. The throughput is shared between all clients. To meet the required coverage, throughput, and quality of your wireless network, install a sufficient number of wireless access points.

The wireless access point acts as a bridge between the wired LAN and wireless clients. Connecting multiple wireless access points through a wired Ethernet backbone can further increase the wireless network coverage. As a mobile computing device moves out of the range of one wireless access point, it moves into the range of another. As a result, wireless clients can freely roam from one wireless access point to another and still maintain a seamless connection to the network.

The autosensing capability of the wireless access point allows packet transmission at up to 300 Mbps, or at reduced speeds to compensate for distance or electromagnetic interference.

What Is in the Box?

The product package contains the following items:

- ProSAFE Single Band 802.11n Wireless Access Point WN203
- Straight through Category 5 Ethernet cable
- Power adapter and cord (12V, 1A)
- Stand
- Two wall mount screws and anchors
- Resource CD
- Installation guide

If any parts are missing or damaged, contact your reseller or customer support in your area. Visit the NETGEAR website at *http://support.netgear.com/general/contact/default.aspx* for the telephone number of customer support in your area.

Keep the installation guide, along with the original packing materials. If you need to return the wireless access point for repair, use the packing materials to repack the wireless access point.

External antennas do not come standard with the wireless access point but can be purchased as an option. If you have purchased external antennas, see *Configure Advanced Wireless Settings* on page 70 for information about how to enable the external antennas.

System Requirements

Before installing the wireless access point, make sure that your system meets these requirements:

- A 10/100/1000 Mbps local area network device such as a hub, switch, or router
- The Category 5 UTP straight-through Ethernet cable with RJ-45 connector that is included in the package, or one like it
- Either a 100–120V, 50–60 Hz AC power source or a hub, switch, or router that provides Power over Ethernet (PoE)
- A computer with the TCP/IP protocol installed and a web browser for configuration, such as Microsoft Internet Explorer 8.0 or later, or Mozilla Firefox 18.0 or later

Key Features and Standards

This section includes the following subsections:

- *Supported Standards and Conventions*
- *Key Features*
- *802.11b/g/n Standards–Based Wireless Networking*
- *Autosensing Ethernet Connections with Auto Uplink*

The wireless access point is easy to use and provides solid wireless and networking support. It also offers a wide range of security options.

Supported Standards and Conventions

The wireless access point supports the following standards and conventions:

- **Standards compliance**. The wireless access point complies with the IEEE 802.11 b/g standards for wireless LANs and is Wi-Fi certified for 802.11n standard.
- **WPA and WPA2**. The wireless access point provides WPA and WPA2 enterprise-class strong security with RADIUS and certificate authentication as well as dynamic encryption key generation. The WPA-PSK and WPA2-PSK pre-shared key authentication does not have the overhead of RADIUS servers but provides the strong security of WPA.
- **Multiple BSSIDs**. The wireless access point supports multiple BSSIDs. When a wireless access point is connected to a wired network and a set of wireless clients, it is called a basic service set (BSS). The basic service set identifier (BSSID) is a unique identifier attached to the header of packets sent over a WLAN that differentiates one WLAN from another when a mobile device tries to connect to the network.

The multiple BSSID feature allows you to configure up to eight SSIDs on your wireless access point and assign different configuration settings to each SSID. All the configured SSIDs are active, and the network devices can connect to the wireless access point by using any of these SSIDs.

- **DHCP server and client**. The DHCP server of the wireless access point can provide a dynamic IP address to wireless clients. The wireless access point can also act as a client and obtain an IP address from a DHCP server on the LAN.
- **SNMP**. The wireless access point supports Simple Network Management Protocol (SNMP) for Management Information Base (MIB) management.
- **STP**. The wireless access point supports Spanning Tree Protocol (STP).
- **802.1Q VLAN**. A network of computers can behave as if they are connected to the same network even though they might actually be physically on different segments of a LAN. Virtual LANs (VLANs) are configured through software rather than hardware, which makes them very flexible. VLANs are very useful for user and host management, bandwidth allocation, and resource optimization.

Key Features

The wireless access point provides solid functionality, including the following features:

- **Multiple operating modes**:
  - **Wireless access point**. The wireless access point operates as a standard 802.11b/g/n access point for clients.
  - **Point-to-point bridge**. The wireless access point communicates with another access point that functions in bridge mode. You can use this mode with or without client association.
  - **Point-to-multipoint bridge**. The wireless access point is the master for a group of access points that function in bridge mode, that send all traffic to the master, and that do not communicate directly with each other. You can use this mode with or without client association.
  - **Repeating the wireless signal**. The wireless access point does not function as an access point for clients but functions only in point-to-*multi*point bridge mode to repeat the wireless signal and send all traffic to a remote access point.
- **WMM**. Wi-Fi Multimedia (WMM) is a subset of the 802.11e standard. WMM allows wireless traffic to have a range of priorities, depending on the kind of data. Time-dependent information, like video or audio, has a higher priority than normal traffic. For WMM to function correctly, wireless clients also need to support WMM.
- **QoS**. Quality of Service (QoS) support lets you configure parameters that affect traffic flowing from the wireless access point to the client station and traffic flowing from the client station to the wireless access point.
- **Hotspot support**. You can allow all HTTP (TCP, port 80) requests to be captured and redirected to the URL you specify.
- **Rogue AP detection**. Rogue AP filtering ensures that unknown APs are not given access to any part of the secured wireless and wired LAN.

- **Access control**. MAC address filtering can ensure that only trusted wireless clients can use the wireless access point to gain access to the wireless and wired LAN.
- **Security profiles**. When using multiple BSSIDs, you can configure unique security settings (encryption, SSID, and so on) for each BSSID.
- **Hidden mode**. The SSID is not broadcast, assuring that only clients configured with the correct SSID can connect.
- **Telnet and SSH command-line interface**. Using an application such as PuTTY, you can access the wireless access point over a Telnet or Secure Shell (SSH) connection and use the command-line interface (CLI) to configure the wireless access point.
- **Upgradeable firmware**. Firmware is stored in flash memory. You can upgrade it easily, using only your web browser, and you can upgrade it remotely. You can also use the command-line interface.
- **Configuration backup**. Configuration settings can be backed up to a file and restored.
- **Secure and economical operation**. Adjustable power output allows more secure or economical operation.
- **PoE support**. Using Power over Ethernet (PoE), any 802.3af-compliant midspan or end-span sources can supply power to the wireless access point over the Ethernet port. The wireless access point can receive all required power on one Ethernet port from a single PoE source.
- **Autosensing Ethernet connection with Auto Uplink™ interface**. Connects to 10/100/1000 Mbps IEEE 802.3 Ethernet networks.
- **LED indicators**. Power, Test, LAN, and WLAN LEDs are easily identified.
- **VLAN security profiles**. Each security profile is automatically allocated a VLAN ID when the security profile is modified.

802.11b/g/n Standards–Based Wireless Networking

The wireless access point provides a bridge between wired Ethernet LANs and 802.11b/g/n-compatible wireless LAN networks. It provides connectivity between wired Ethernet networks and radio-equipped wireless notebook systems, desktop systems, print servers, RFID tags, and other devices.

In addition, the wireless access point supports the following wireless features:

- Aggregation support
- Reduced InterFrame spacing support
- 2x2 multiple input, multiple output (MIMO) support
- Distributed coordinated function (CSMA/CA, back-off procedure, ACK procedure, retransmission of unacknowledged frames)
- RTS/CTS handshake
- Beacon generation
- Packet fragmentation and reassembly
- Auto or long preamble

- Roaming among wireless access points on the same subnet

Autosensing Ethernet Connections with Auto Uplink

The wireless access point can connect to a standard Ethernet network. The LAN interface is autosensing and capable of full-duplex or half-duplex operation.

The wireless access point incorporates Auto Uplink technology. The Ethernet port automatically senses whether the Ethernet cable plugged into the port should have a "normal" connection such as to a computer or an "uplink" connection such as to a switch or hub. That port then configures itself correctly. This feature also eliminates any concerns about crossover cables, because Auto Uplink accommodates either type of cable to make the right connection.

Hardware Description

This section describes the front and back hardware functions of the wireless access point.

- *Front Panel*
- *Back Panel*
- *Bottom Panel with Product Label and Reset to Factory Defaults Button*

Front Panel

The LEDs of the wireless access point are described in the following figure and table:

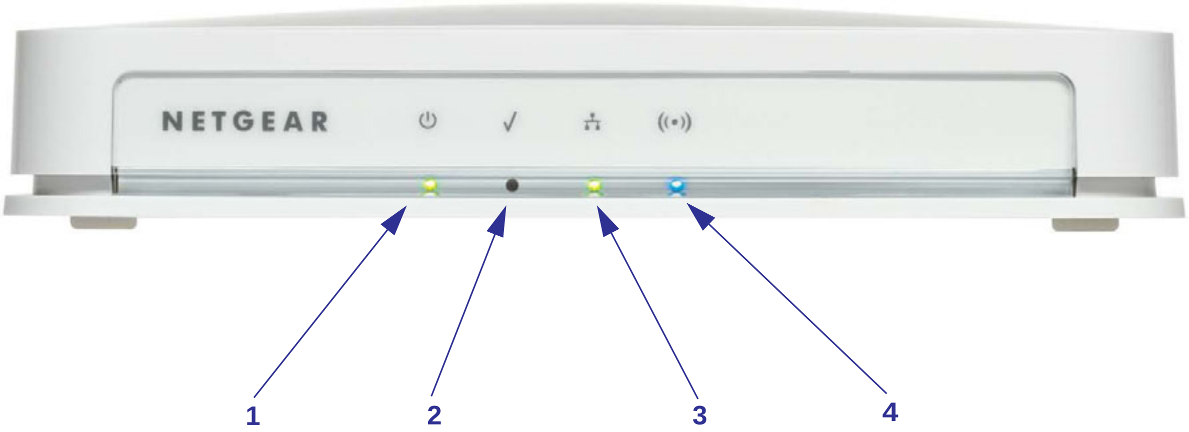


Figure 1. Front panel with LEDs

Table 1. Front panel LEDs

Item	LED	Description		
1	⏻	**Power**	Off	Power is off.
			Green	Power is on.
2	√	**Test**	Off	The wireless access point functions normally.
			Amber	The wireless access point is starting. After about one minute, the LED turns off.
			Blinking amber	New firmware is being loaded.
3	🖧	**LAN**	Off	No link is detected on the LAN port.
			Amber	A 100 Mbps or 10 Mbps link is detected on the LAN port.
			Green	A 1000 Mbps link is detected on the LAN port.
4	((•))	**WLAN**	Off	The wireless LAN is not ready, or no wireless activity is detected.
			Blue	The wireless LAN is ready.
			Blinking Blue	Wireless activity is detected.

Back Panel

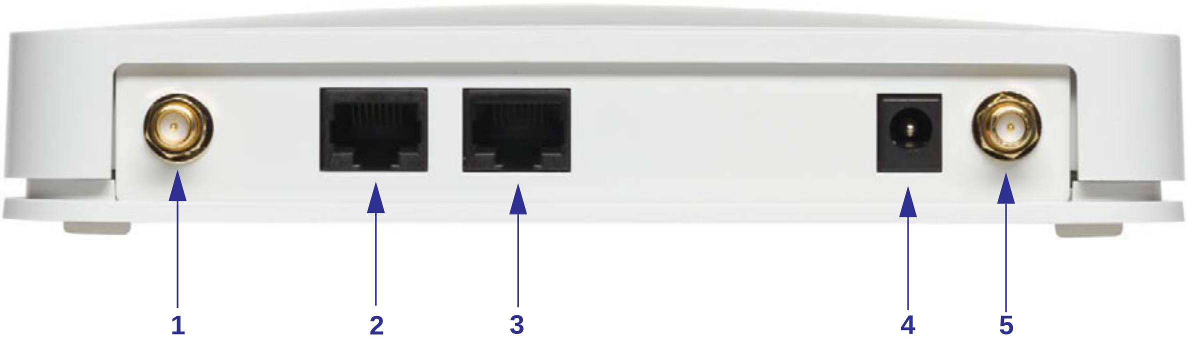


Figure 2. Back panel

The back panel components of the wireless access point, from left to right, are described in the following list:

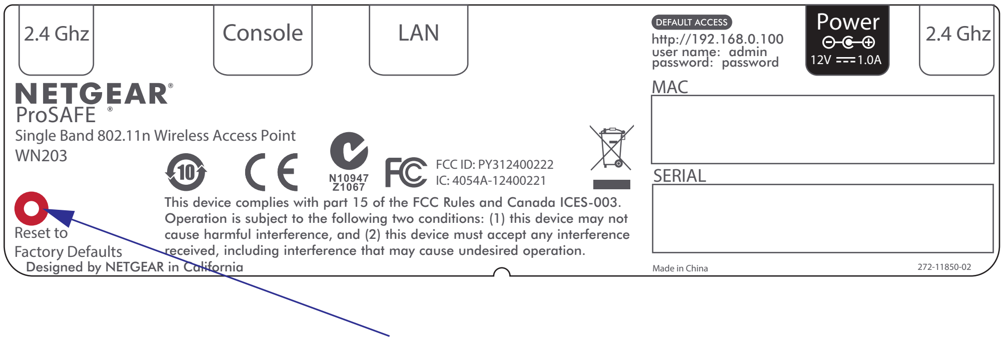
1. Reverse SMA connector for an optional 2.4 GHz antenna.
2. Console port for connecting to an optional console terminal. The port has an RJ-45 connector and supports the following settings: 115200 K default baud rate, (8) data bits, no (N) parity bit, and one (1) stop bit.
3. 10/100/1000BASE-T Gigabit Ethernet RJ-45 LAN port with Auto Uplink (Auto MDI-X) and IEEE 802.3af Power over Ethernet (PoE) support for connection to a switch or router.

4. Power socket for a 12 VDC, 1A power adapter.
5. Reverse SMA connector for an optional 2.4 GHz antenna.

If you have purchased external antennas, see *Configure Advanced Wireless Settings* on page 70 for information about how to enable the external antennas.

Bottom Panel with Product Label and Reset to Factory Defaults Button

The product label on the bottom of the wireless access point’s enclosure displays factory default settings, regulatory compliance, and other information. The bottom panel also contains the recessed Reset to Factory Defaults button, which is indicated on the product label.



This device complies with part 15 of the FCC Rules and Canada ICES-003. 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.

Reset to Factory Defaults button

Figure 3. Product label on the bottom

- **To reset the wireless access point to factory default settings:**

Use a sharp object to press and hold the **Reset to Factory Defaults** button for about 10 seconds.

All custom configuration settings are lost, and the default password is restored. For more information, see *Restore the Wireless Access Point to the Factory Default Settings* on page 58.

Installation and Basic Configuration

2

This chapter describes how to install and configure the wireless access point for wireless connectivity to your LAN. This basic configuration enables computers with 2.4 GHz 802.11b/g/n wireless adapters to connect to the Internet or access printers and files on your LAN. In planning your wireless network, consider the level of security required. *Chapter 3, Wireless Configuration and Security*, describes how to set up wireless security for your network. This chapter includes the following sections:

- *What You Need Before You Begin*
- *Install and Configure the Wireless Access Point*
- *Test Basic Wireless Connectivity*

What You Need Before You Begin

You need to consider the guidelines and requirements in the following sections before you can set up your wireless access point.

See also *System Requirements* on page 8.

- *Wireless Equipment Placement and Range Guidelines*
- *Ethernet Cabling Requirements*
- *LAN Configuration Requirements*
- *Hardware Requirements for Computers on Your LAN*
- *Requirements for Entering IP Addresses*

Wireless Equipment Placement and Range Guidelines

The range of your wireless connection can vary significantly based on the location of the wireless access point. The latency, data throughput performance, and power consumption of wireless adapters also vary depending on your configuration choices.

Note: Failure to follow these guidelines can result in significant performance degradation or inability to connect wirelessly to the wireless access point. For complete performance specifications, see *Appendix A, Supplemental Information*.

For best results, place your wireless access point according to the following general guidelines:

- Near the center of the area in which the wireless devices will operate.
- In an elevated location such as a high shelf where the wirelessly connected devices have line-of-sight access (even if through walls).
- Away from sources of interference, such as computers, microwaves ovens, and 2.4 GHz cordless phones.
- Away from large metal surfaces or water.

The time it takes to establish a wireless connection can vary depending on both your security settings and placement. WEP connections can take slightly longer to establish. Also, WEP encryption can consume more battery power on a notebook computer.

Ethernet Cabling Requirements

The wireless access point connects to your LAN using twisted-pair Category 5 Ethernet cable with RJ-45 connectors.

LAN Configuration Requirements

For the initial configuration of your wireless access point, you need to connect a computer to the wireless access point.

Hardware Requirements for Computers on Your LAN

To connect to the wireless access point on your network, each computer needs to have an 802.11b/g/n wireless adapter installed.

Requirements for Entering IP Addresses

The fourth octet of an IP address needs to be between 0 and 255 (both inclusive). This requirement applies to any IP address that you enter on a screen of the web management interface.

Install and Configure the Wireless Access Point

Install and configure your wireless access point in the order of the following sections:

1. *Connect the Wireless Access Point to a Computer*
2. *Log In to the Wireless Access Point*
3. *Configure Basic General System Settings and Time Settings*
4. *Configure the IP Settings*
5. *Configure the Optional DHCP Server*
6. *Configure the Basic Wireless Settings*

Before installing the wireless access point, make sure that your Ethernet network functions. After you have connected the wireless access point to the Ethernet network, computers with 802.11b/g/n wireless adapters are able to communicate with the Ethernet network.

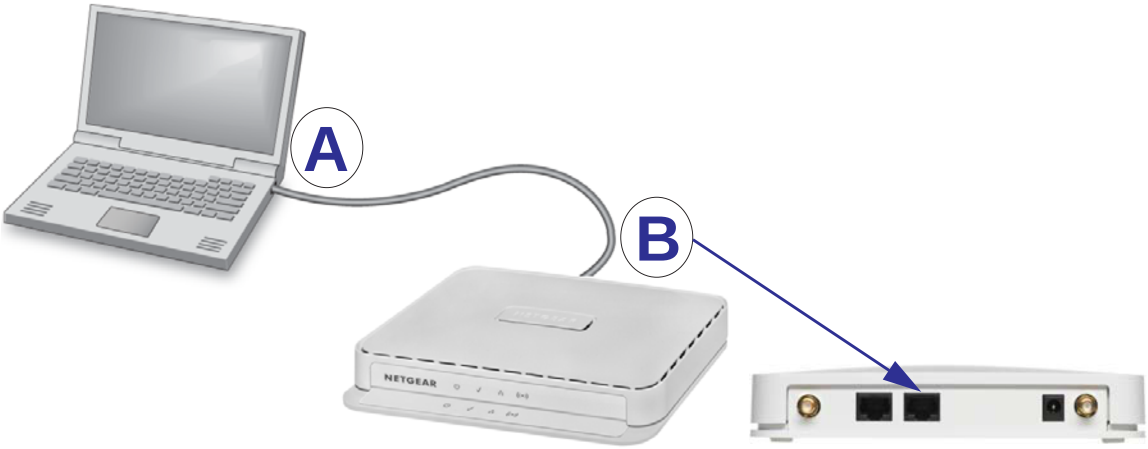
Before you start the installation and configuration process, verify that you have met all the system requirements. See *System Requirements* on page 8.

Connect the Wireless Access Point to a Computer

Tip: Before you place the wireless access point in an elevated position that is difficult to reach, first set up and test the wireless access point to verify wireless network connectivity.

➢ **To set up the wireless access point:**

1. Unpack the box and verify the contents.
2. Prepare a computer with an Ethernet adapter:
   a. If this computer is already part of your network, record its TCP/IP configuration settings.
   b. Configure the computer with a static IP address of 192.168.0.210 and 255.255.255.0 as the subnet mask.
3. Connect an Ethernet cable to the Ethernet port (**A**) of the computer.
4. Securely insert the other end of the Ethernet cable into the wireless access point's LAN port (**B**).



5. Turn on your computer.
6. Connect the power adapter to the wireless access point.

Tip: The wireless access point supports Power over Ethernet (PoE). If you have a switch that provides PoE, you do not need to use the power adapter to power the wireless access point. Using PoE can be especially convenient when the wireless access point is installed in a high location far away from a power outlet.

7. Verify the following:

⏻ **Power LED**. The Power LED is green. If the Power LED is off, check the connections, and check if the power outlet is controlled by a wall switch that is turned off.

Test LED. The Test LED is amber. After about one minute, the Test LED turns off.

LAN LED. The LAN LED indicates the LAN speed for the LAN port: green for 1000 Mbps or amber for 100 Mbps or 10 Mbps.

WLAN LED. The WLAN LED is blue when the wireless LAN (WLAN) is ready.

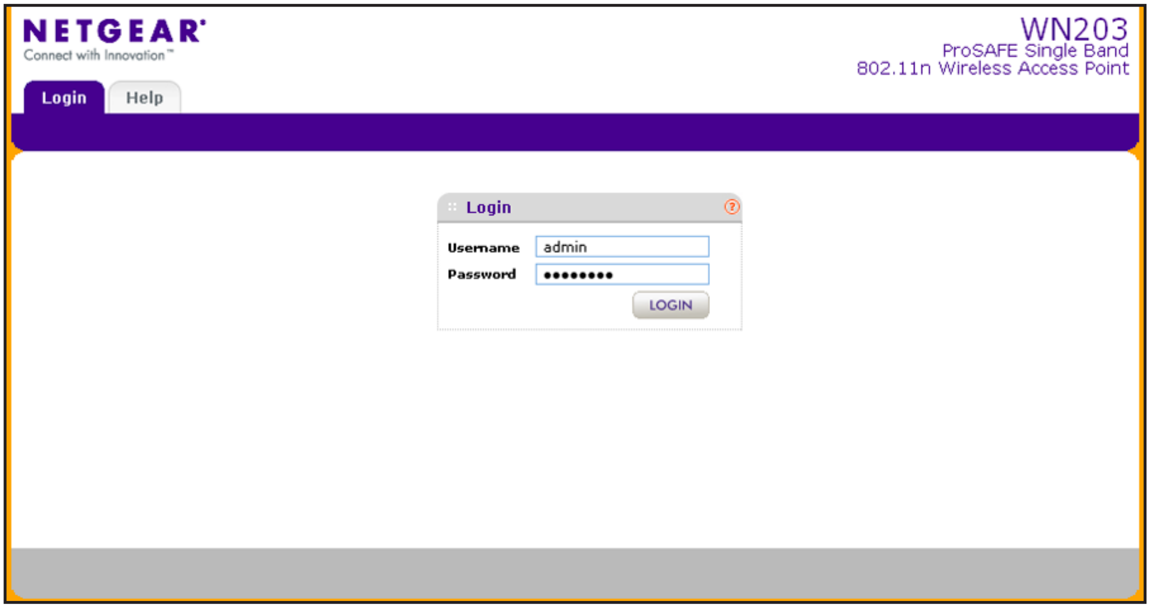
Log In to the Wireless Access Point

The default IP address of your wireless access point is 192.168.0.100. By default, the DHCP client on the wireless access point is disabled so you can log in using the default IP address.

➢ **To log in to the wireless access point:**

1. Open a web browser such as Microsoft Internet Explorer 8.0 or later, or Mozilla Firefox 18.0 or later.
2. Connect to the wireless access point by entering its default address of **192.168.0.100** into your browser (use http and not https).

   The Login screen displays:

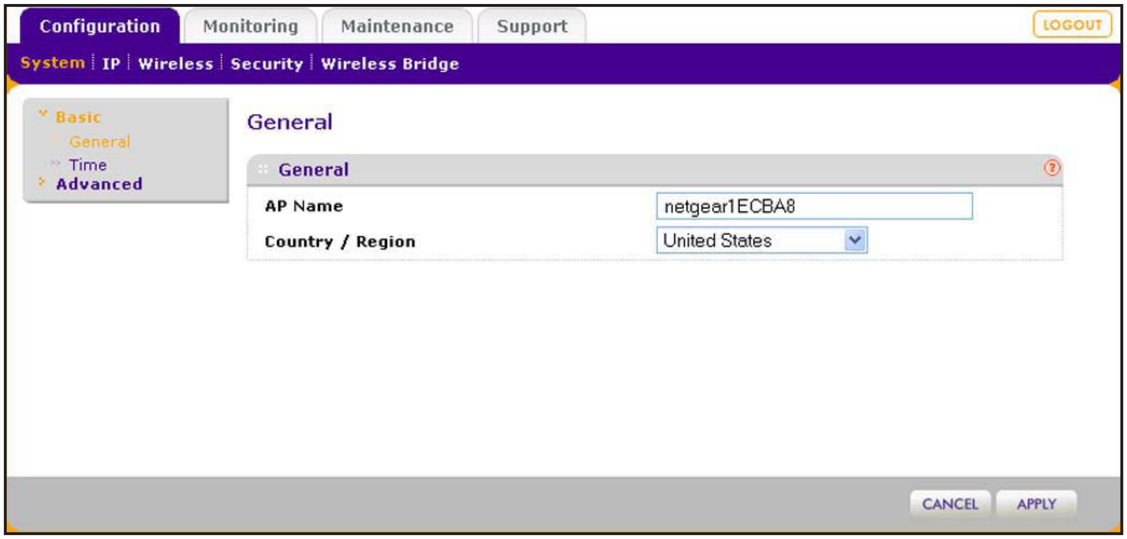


Username admin

Password ••••••••

3. Enter the default user name of **admin** and the default password of **password**.
4. Click the **Login** button.

   The web browser displays the basic General system settings screen under the Configuration tab of the main menu:



AP Name: netgear1ECBA8

Country / Region: United States

The navigation tabs across the top of the web management interface provide access to all the configuration functions of the wireless access point and remain constant. The menu items in the blue bar change according to the navigation tab that is selected.

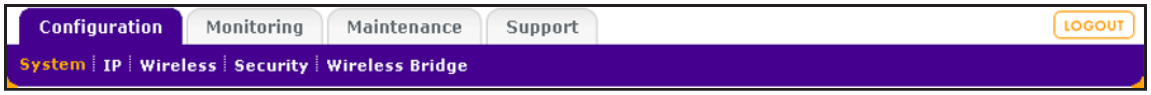


Figure 4. Navigation tabs and menu items

The bottom right corner on all screens that allow you to make configuration changes show the Apply and Cancel buttons.

Figure 5. Buttons

These buttons have the following functions:

- **Cancel**. Cancels all configuration changes that you made on the screen.
- **Apply**. Saves and applies all configuration changes that you made on the screen.

The following buttons can be displayed:

- **Edit**. Lets you edit the existing configuration.
- **Save** or **Save As**. Lets you save the information that is displayed onscreen to a file.
- **Details**. Provides more details for the information that is displayed in a table onscreen.
- **Refresh**. Refreshes the information that is displayed onscreen.
- **Clear**. Clears the information that is displayed onscreen.
- **Back**. Returns to the previous screen.
- **Send**. Sends a test command.

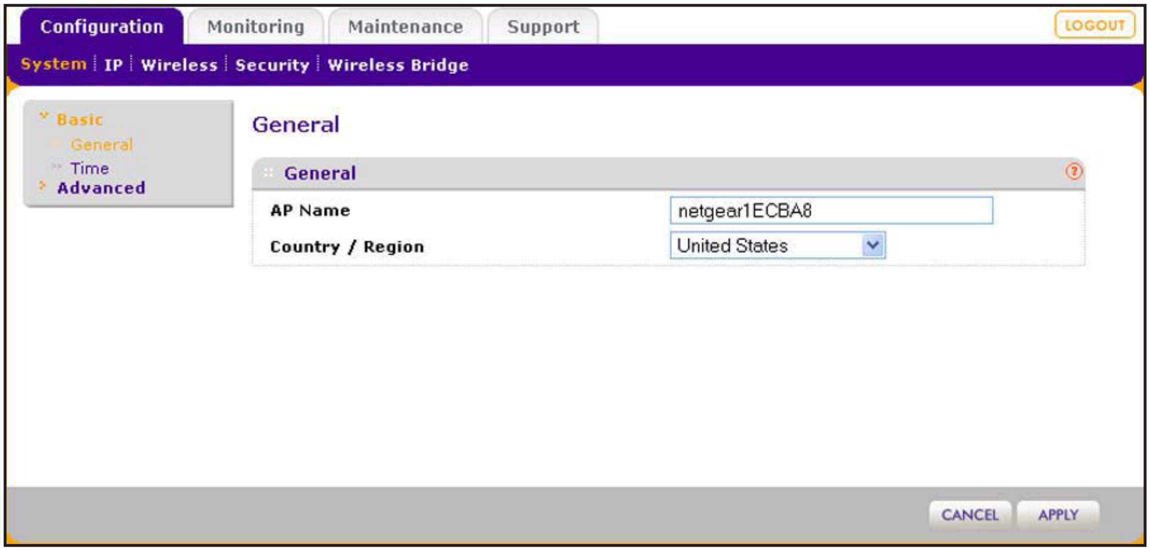
Configure Basic General System Settings and Time Settings

After you have successfully logged in to the wireless access point, the basic General system settings screen displays.

➢ **To configure basic system settings:**

1. Select **Configuration > System > Basic > General**.

   The basic General system settings screen displays:



General

General

AP Name: netgear1ECBA8

Country / Region: United States

2. Configure the settings as described in the following table:

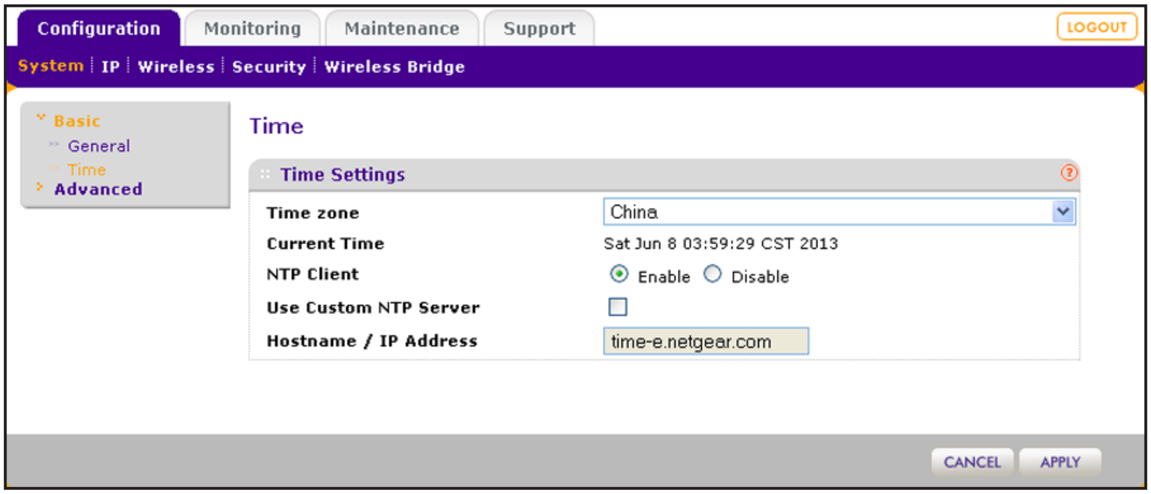
Setting	Description
AP Name	This unique name is the wireless access point NetBIOS name. The name is printed on the label of the wireless access point. The default is netgear*xxxxxx*, in which *xxxxxx* represents the last six digits of the wireless access point MAC address. You can replace the default name with a unique name up to 15 characters long. The access point name can be retrieved through SNMP.
Country / Region	From the Country / Region drop-down menu, select the country where the wireless access point is installed. **Note:** It might not be legal to operate this wireless access point in a region other than one of the regions that you can select from the drop-down menu.

3. Click the **Apply** button.

➢ To configure time settings:

1. Select **Configuration > System > Basic > Time**.

   The Time screen displays:



Time zone	China
Current Time	Sat Jun 8 03:59:29 CST 2013
NTP Client	● Enable ○ Disable
Use Custom NTP Server	□
Hostname / IP Address	time-e.netgear.com

2. Configure the settings as described in the following table:

<table>
<tr><th>Setting</th><th colspan="2">Description</th></tr>
<tr><td>Time Zone</td><td colspan="2">Select the time zone to match your location.</td></tr>
<tr><td>Current Time</td><td colspan="2">This is a nonconfigurable field that displays the current date and time.</td></tr>
<tr><td>NTP Client</td><td colspan="2">Enable the Network Time Protocol (NTP) client to synchronize the time of the wireless access point with an NTP server. By default the Enable radio button is selected.</td></tr>
<tr><td rowspan="2">Use Custom NTP Server</td><td colspan="2">Select this check box if you want to use a custom NTP server.
<b>Note:</b> You need to have an Internet connection to use an NTP server that is not on your local network.</td></tr>
<tr><td>Hostname / IP Address</td><td>Enter the host name or IP address of the custom NTP server. The default NTP server depends on the selected time zone. For example, for China the default is time-e.netgear.com.
<b>Note:</b> If you use a host name, make sure that you have configured a DNS server. For more information, see the next section.</td></tr>
</table>

3. Click the **Apply** button.

Configure the IP Settings

WARNING:

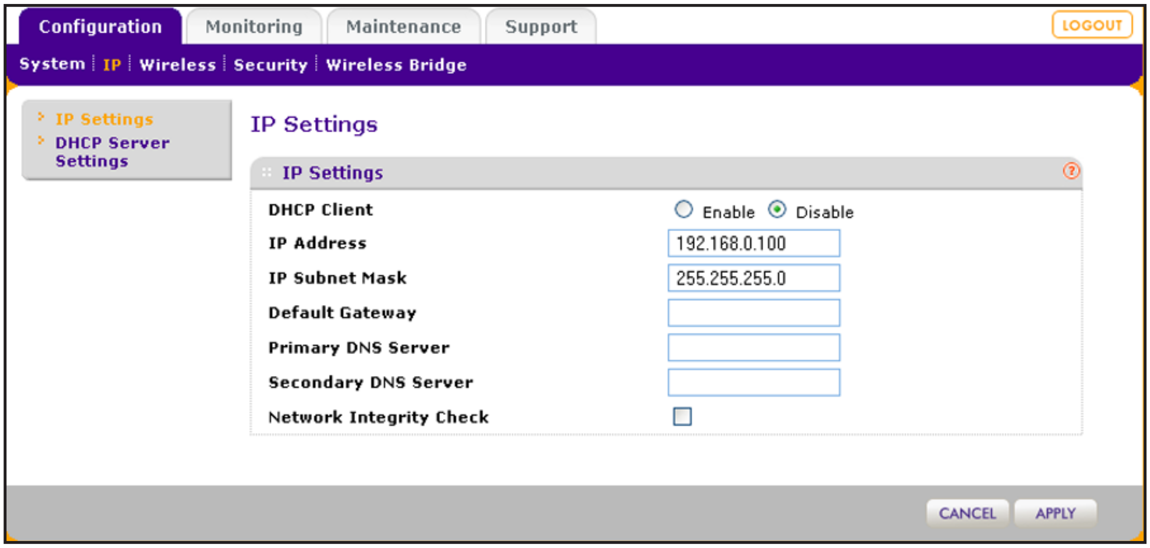
If you enable the DHCP client, the IP address of the wireless access point changes when you click the Apply button, causing you to lose your connection to the wireless access point. You then need to use the new IP address to reconnect to the wireless access point.

Tip: If you enable the DHCP client on the wireless access point, you can discover the new IP address of the wireless access point by accessing the DHCP server on your LAN, or by using a network IP address scanner application.

➢ **To configure the IP settings:**

1. Select **Configuration > IP > IP Settings**.

   The IP Settings screen displays:



IP Settings

IP Settings

DHCP Client	○ Enable ● Disable
IP Address	192.168.0.100
IP Subnet Mask	255.255.255.0
Default Gateway	
Primary DNS Server	
Secondary DNS Server	
Network Integrity Check	□

2. Configure the IP settings as described in the following table:

Setting	Description
DHCP Client	By default, the Dynamic Host Configuration Protocol (DHCP) client is disabled. If you have a DHCP server on your LAN and you select the Enable radio button, the wireless access point receives its IP address, subnet mask, and default gateway settings automatically from the DHCP server on your network when you connect the wireless access point to your LAN.
IP Address	If you do not enable the DHCP client, enter the IP address of your wireless access point. The default IP address is **192.168.0.100**. To change the address, enter an unused IP address from the address range that is used on your LAN.
IP Subnet Mask	If you do not enable the DHCP client, enter the network number portion of an IP address. Unless you are implementing subnetting, enter **255.255.0.0** as the subnet mask.
Default Gateway	If you do not enable the DHCP client, enter the IP address of the ISP gateway to which the wireless access point connects.
Primary DNS Server	If you do not enable the DHCP client, enter the IP addresses of the primary and secondary DNS servers. A DNS server is a host on the Internet that translates Internet names (such as www.netgear.com) to numeric IP addresses. Typically your ISP transfers the IP address of one or two DNS servers to your wireless access point during login. If the ISP does not transfer addresses, you need to obtain them from the ISP and enter them manually in these fields.
Secondary DNS Server	
Network Integrity Check	Select this check box to validate that the upstream link is active before allowing wireless associations. Ensure that the default gateway is configured.

3. Click the **Apply** button.

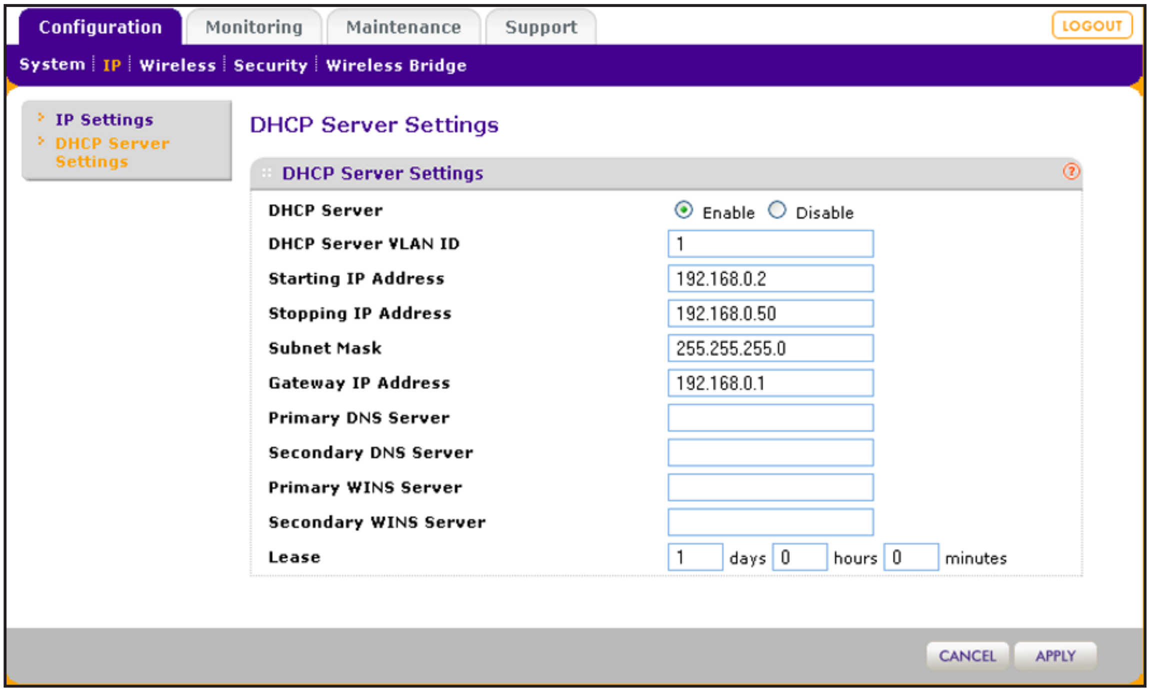
Configure the Optional DHCP Server

The wireless access point provides a built-in DHCP server for wireless clients only, which can be especially useful in small networks. By default, the DHCP server is disabled. When the DHCP server is enabled, the wireless access point provides preconfigured TCP/IP configurations to all connected wireless clients.

➢ **To configure DHCP server settings:**

1. Select **Configuration > IP > DHCP Server Settings**.

   The DHCP Server Settings screen displays:



DHCP Server Settings

DHCP Server Settings

DHCP Server	● Enable ○ Disable
DHCP Server VLAN ID	1
Starting IP Address	192.168.0.2
Stopping IP Address	192.168.0.50
Subnet Mask	255.255.255.0
Gateway IP Address	192.168.0.1
Primary DNS Server	
Secondary DNS Server	
Primary WINS Server	
Secondary WINS Server	
Lease	1 days 0 hours 0 minutes

2. Configure the settings as described in the following table:

Setting	Description
Select the **Enable** radio button to enable the DHCP server. Use the default settings or specify the pool of IP addresses to be assigned by setting the starting IP address and ending IP address. These addresses should be part of the same IP address subnet as the wireless access point’s LAN IP address.	
DHCP Server VLAN ID	Enter the VLAN ID for the DHCP server. The VLAN ID range is from 1 to 4094. The default VLAN is 1.
Starting IP Address	Enter the first address in the range of IP addresses to be assigned to DHCP clients. The default address is 192.168.1.02.
Stopping IP Address	Enter the last address in the range of IP addresses to be assigned to DHCP clients. The default address is 192.168.1.50.
Subnet Mask	Enter the subnet mask to be used by DHCP clients. The default mask is 255.255.255.0.
Gateway IP Address	Enter the IP address of the default routing gateway to be used by DHCP clients. The default address is 192.168.0.1.
Primary DNS Server	Enter the IP address of the primary Domain Name System (DNS) server available to DHCP clients.
Secondary DNS Server	Enter the IP address of the secondary DNS server available to DHCP clients.
Primary WINS Server	Enter the IP address of the primary WINS server for the network, if there is any.

Setting	Description
Secondary WINS Server	Enter the IP address of the secondary WINS server for the network, if there is any.
Lease	Enter the period that the DHCP server grants to DHCP clients to use the assigned IP addresses. The default time is 1 (one day).

3. Click the **Apply** button.

Configure the Basic Wireless Settings

For proper compliance and compatibility between similar products in your coverage area, you need to configure the 802.11b/g/n wireless adapter settings correctly, including the operating channel and country. You also need to configure the basic wireless network settings for wireless devices to connect to your network. For other wireless features, including wireless security, see *Chapter 3, Wireless Configuration and Security*.

Operating Frequency (Channel) Guidelines

You do not need to change the operating frequency (channel) unless you notice interference problems or you place the wireless access point near another wireless access point. If you do change the operating frequency, observe the following guidelines:

- Wireless access points use a fixed channel. You can select a channel that provides the least interference and best performance. In the United States and Canada, 11 channels are available.
- If you are using multiple wireless access points, it is better if adjacent wireless access points use different radio frequency channels to reduce interference. The recommended channel spacing between adjacent wireless access points is five channels (for example, use Channels 1 and 6, or 6 and 11, or 1 and 11).
- In infrastructure mode (which is the default mode for the wireless access point), wireless clients normally scan all channels, looking for a wireless access point. If more than one wireless access point is available, and the wireless access points use the same SSID, a wireless client uses the wireless access point with the strongest signal.

Configure 802.11b/bg/ng Wireless Settings

The basic Wireless Settings screen lets you configure the wireless mode, SSID, and other wireless settings.

WARNING:

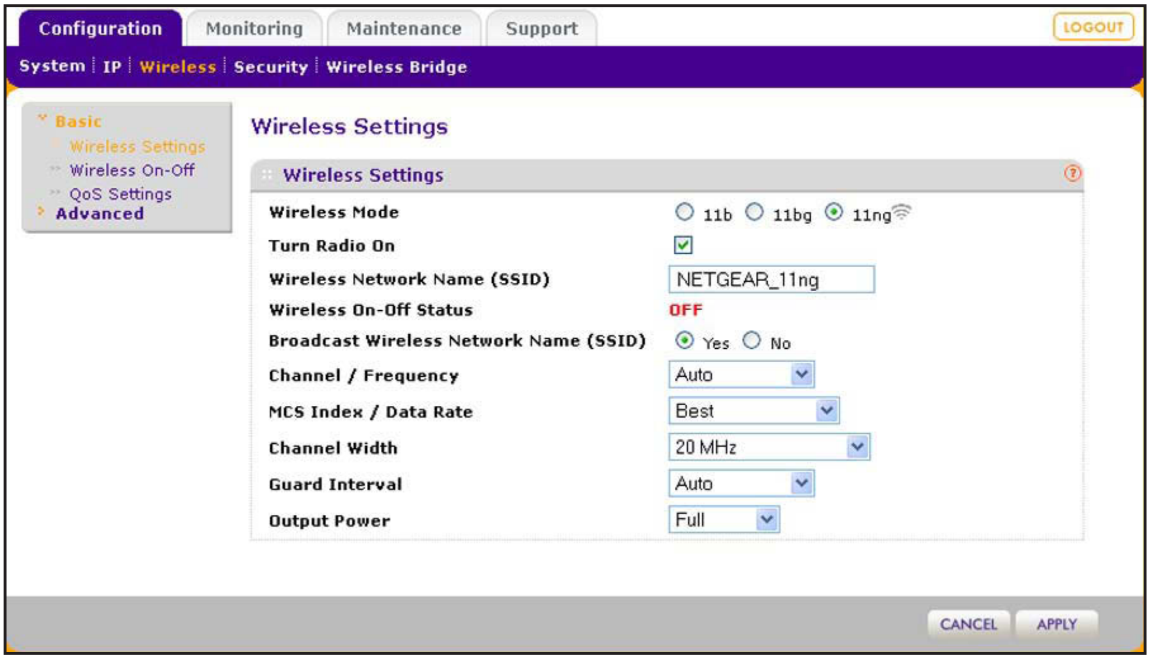
If you configure the wireless access point from a wireless computer and you change the wireless access point’s SSID, channel, or wireless security settings, you lose your wireless connection when you click the Apply button. You then need to change the wireless settings of your computer to match the wireless access point’s new settings.

➢ **To configure the 802.11b/g/n wireless settings:**

1. Select **Configuration > Wireless > Basic > Wireless Settings**.

   The basic Wireless Settings screen displays. The following figure shows the 11ng settings.

Note: The radio wave icon (📶) displays next to the enabled wireless mode (b, bg, or ng).



Wireless Settings

Wireless Settings	
Wireless Mode	○ 11b ○ 11bg ● 11ng📶
Turn Radio On	☑
Wireless Network Name (SSID)	NETGEAR_11ng
Wireless On-Off Status	OFF
Broadcast Wireless Network Name (SSID)	● Yes ○ No
Channel / Frequency	Auto
MCS Index / Data Rate	Best
Channel Width	20 MHz
Guard Interval	Auto
Output Power	Full

2. Select one of the following 2.4 GHz band radio buttons:
   - **11b**. Both 802.11n- and 802.11g-compliant devices can connect to the access point because they are backward compatible.
   - **11bg**. 802.11n-compliant devices can connect to the access point because they are backward compatible.
   - **11ng**. This is the default setting. 802.11b-compliant devices cannot connect to the access point. If you keep the default setting, go to *Step 5*.

   When you change the wireless mode, the Turn Radio On check box is automatically cleared, and all fields, buttons, and drop-down menus onscreen are masked out.

3. Turn on the radio by selecting the **Turn Radio On** check box.

   A pop-up screen displays.

Note: *Under normal conditions, you want the radio to be turned on. Turning off the radio disables access through the wireless access point, which can be helpful for configuration, network tuning, or troubleshooting activities.*

4. Click the **OK** button to confirm the change of wireless mode.

   The change does not take effect until after you have completed the wireless configuration and have clicked the Apply button.

5. Specify the remaining wireless settings as described the following table:

Setting	Descriptions
Wireless Network Name (SSID)	Enter a 32-character (maximum) service set identifier (SSID); the characters are case-sensitive. The default is NETGEAR_11ng. The SSID assigned to a wireless device needs to match the wireless access point's SSID for the wireless device to communicate with the wireless access point. If the SSIDs do not match, you do not get a wireless connection to the wireless access point.
Wireless On-Off Status	This field is not configurable. It shows the status of the wireless scheduler. For more information, see *Schedule the Wireless Radios to Be Turned Off* on page 49.
Broadcast Wireless Network Name (SSID)	Select the **Yes** radio button to enable the wireless access point to broadcast its SSID, allowing wireless clients that have a null (blank) SSID to adopt the wireless access point's SSID. Yes is the default setting. To prevent the SSID from being broadcast, select the **No** radio button.
Channel / Frequency	From the drop-down menu, select the channel you wish to use for your wireless LAN. The wireless channels and frequencies depend on the country and wireless mode. The default setting is Auto. **Note:** You should not have to change the wireless channel unless you experience interference (indicated by lost connections or slow data transfers). If this situation occurs, you might want to experiment with different channels to see which is the best. For more information, see *Operating Frequency (Channel) Guidelines* on page 25. **Note:** For more information about available channels and frequencies, see *Technical Specifications* on page 107.

Setting	Descriptions	
MCS Index / Data Rate 11ng mode only **Note:** For most networks, the default settings work fine.	From the drop-down menu, select a Modulation and Coding Scheme (MCS) index and transmit data rate for the wireless network. The default setting is Best. For a list of all options that you can select, see *Technical Specifications* on page 107.	
	Channel Width	From the drop-down menu, select a channel width. The options are Dynamic 20/40 MHz, 20 MHz, and 40 MHz. The default is 20 MHz. A wider channel improves the performance, but some legacy devices can operate only in either 20 MHz or 40 MHz.
	Guard Interval	From the drop-down menu, select the guard interval to protect transmissions from interference. The default is Auto, or you can select Long - 800 ns. Some legacy devices can operate only with a long guard interval.
Output Power	From the drop-down menu, select the transmission power of the wireless access point: Full, Half, Quarter, Eighth, Minimum. The default is Full. **Note:** Increasing the power improves performance, but if two or more wireless access points are operating in the same area and on the same channel, interference can occur. **Note:** Make sure that you comply with the regulatory requirements for total radio frequency (RF) output power in your country.	

6. Click the **Apply** button.

   The selected wireless mode is now enabled.

Note: For information about how to configure advanced wireless settings, see *Configure Advanced Wireless Settings* on page 70.

Test Basic Wireless Connectivity

After you have configured the wireless access point as described in the previous sections, test the computers on your LAN for wireless connectivity before you position the wireless access point at its permanent position.

➢ **To test for wireless connectivity:**

1. Configure the 802.11b/g/n wireless adapters of your computers so that they all have the same SSID and channel that you have configured on the wireless access point.
2. Verify that your computers have a wireless link to the wireless access point. If you have enabled the DHCP server on the wireless access point, verify that your computers are able to obtain an IP address through DHCP from the wireless access point.

3. Verify network connectivity by using a browser such as Microsoft Internet Explorer 8.0 or later, or Mozilla Firefox 18.0 or later to browse the Internet, or check for file and printer access on your network.

> **Note:** If you have trouble connecting to the wireless access point, see *Chapter 7, Troubleshooting*.

NETGEAR recommends that you complete the following tasks before you deploy the wireless access point in your network:

- Configure wireless security and other wireless features. See *Chapter 3, Wireless Configuration and Security*.
- Configure any additional features that you might need. See *Chapter 4, Management*, and *Chapter 5, Advanced Configuration*.

After you have completed the configuration of the wireless access point, you can reconfigure the computer that you used for this process back to its original TCP/IP settings.

Wireless Configuration and Security

3

This chapter describes how to configure the wireless features of the wireless access point. The chapter includes the following sections:

- *Before You Configure Wireless Security*
- *Wireless Data Security Options*
- *Security Profiles*
- *Configure RADIUS Server Settings*
- *Restrict Wireless Access by MAC Address*
- *Schedule the Wireless Radios to Be Turned Off*
- *Configure Basic Wireless Quality of Service*

Before You Configure Wireless Security

Before you set up wireless security and additional wireless features that are described in this chapter, connect the wireless access point, get the Internet connection working, set the country or region correctly, and configure the 802.11b, 11bg, or 11ng wireless settings. See *Chapter 2, Installation and Basic Configuration*.

The wireless access point functions with an Ethernet LAN connection. Make sure that you have verified wireless connectivity before you set up wireless security and additional wireless features.

WARNING:

If you are configuring the wireless access point from a wireless computer and you change the wireless access point’s SSID, channel, or wireless security settings, you lose your wireless connection when you click the Apply button. You then need to change the wireless settings of your computer to match the wireless access point’s new settings.

Wireless Data Security Options

Indoors, computers can connect over 802.11n wireless networks at a maximum range of 300 feet. Typically, a wireless access point inside a building works best with devices within a 100-foot radius. Such distances can allow for others outside your immediate area to access your network.

Unlike wired network data, your wireless data transmissions can extend beyond your walls and can be received by anyone with a compatible adapter. For this reason, use the security features of your wireless equipment. The wireless access point provides highly effective security features that are covered in detail in this chapter. Deploy the security features appropriate to your needs.

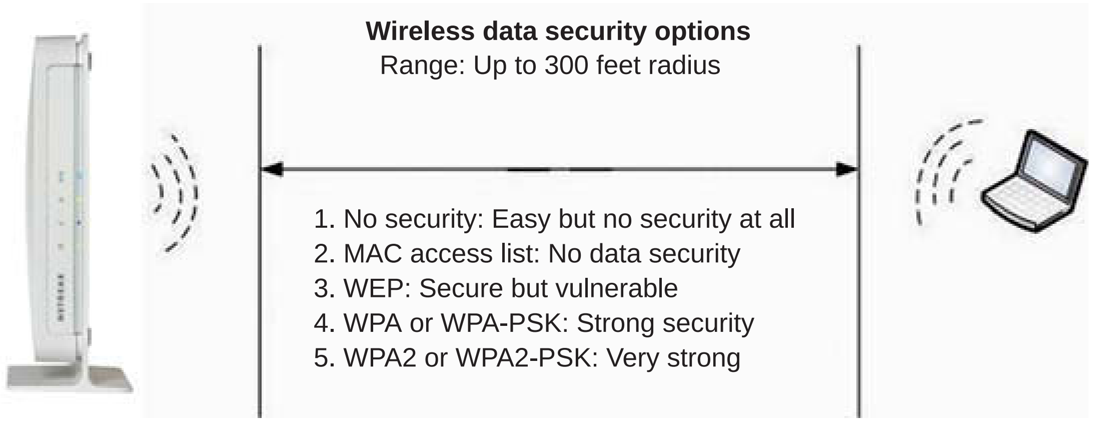

Wireless data security options
Range: Up to 300 feet radius
1. No security: Easy but no security at all
2. MAC access list: No data security
3. WEP: Secure but vulnerable
4. WPA or WPA-PSK: Strong security
5. WPA2 or WPA2-PSK: Very strong

Figure 6. Wireless data security options

There are many ways in which you can enhance the security of your wireless network:

- **Use multiple BSSIDs combined with VLANs**. You can configure combinations of VLANS and BSSIDs (security profiles) with stronger or less restrictive access security according to your requirements. For example, visitors could be given wireless Internet access but be excluded from any access to your internal network.

  For information about how to configure BSSIDs, see *Configure and Enable Security Profiles* on page 36.

- **Restrict access based by MAC address**. You can allow only trusted devices to connect so that unknown devices cannot wirelessly connect to the wireless access point. Restricting access by MAC address adds an obstacle against unwanted access to your network, but the data broadcast over the wireless link is fully exposed.

  For information about how to restrict access by MAC address, see *Restrict Wireless Access by MAC Address* on page 46.

- **Turn off the broadcast of the wireless network name (SSID)**. If you disable broadcast of the SSID, only devices that have the correct SSID can connect. This nullifies the wireless network discovery feature of some products, such as Windows XP, but the data is still exposed.

  For information about how to turn off broadcast of the SSID, see *Configure and Enable Security Profiles* on page 36.

- **WEP**. Wired Equivalent Privacy (WEP) data encryption provides data security. WEP shared key authentication and WEP data encryption block all but the most determined eavesdropper. This data encryption mode has been superseded by WPA-PSK and WPA2-PSK.

  For information about how to configure WEP, see the following sections:

  - *Configure and Enable Security Profiles* on page 36
  - *Configure an Open System with WEP or Shared Key with WEP* on page 40

- **Legacy 802.1X**. Legacy 802.1X uses RADIUS-based 802.1x authentication but no data encryption.

  For information about how to configure Legacy 802.1X, see the following sections:

  - *Configure and Enable Security Profiles* on page 36
  - *Configure Legacy 802.1X* on page 42

- **WPA and WPA-PSK (TKIP)**. Wi-Fi Protected Access (WPA) data encryption provides strong data security with Temporal Key Integrity Protocol (TKIP) encryption. The very strong authentication along with dynamic per-frame rekeying of WPA makes it virtually impossible to compromise.

  WPA uses RADIUS-based 802.1x authentication; for more information, see the following sections:

  - *Configure and Enable Security Profiles* on page 36
  - *Configure WPA with RADIUS, WPA2 with RADIUS, and WPA & WPA2 with RADIUS* on page 42

WPA-PSK uses a pre-shared key (PSK) for authentication; for more information, see the following sections:

- *Configure and Enable Security Profiles* on page 36
- *Configure WPA-PSK, WPA2-PSK, and WPA-PSK & WPA2-PSK* on page 43

- **WPA2 and WPA2-PSK (AES)**. Wi-Fi Protected Access version 2 (WPA2) data encryption provides strong data security with Advanced Encryption Standard (AES) encryption. The very strong authentication along with dynamic per-frame rekeying of WPA2 makes it virtually impossible to compromise.

  WPA2 uses RADIUS-based 802.1x authentication; for more information, see the following sections:

  - *Configure and Enable Security Profiles* on page 36
  - *Configure WPA with RADIUS, WPA2 with RADIUS, and WPA & WPA2 with RADIUS* on page 42

  WPA2-PSK uses a pre-shared key (PSK) for authentication; for more information, see the following sections:

  - *Configure and Enable Security Profiles* on page 36
  - *Configure WPA-PSK, WPA2-PSK, and WPA-PSK & WPA2-PSK* on page 43

- **WPA & WPA2 and WPA-PSK & WPA2-PSK mixed modes**. These modes support data encryption either with both WPA and WPA2 clients or with both WPA-PSK and WPA2-PSK clients and provide the most reliable security.

  WPA & WPA2 uses RADIUS-based 802.1x authentication; for more information, see the following sections:

  - *Configure and Enable Security Profiles* on page 36
  - *Configure WPA with RADIUS, WPA2 with RADIUS, and WPA & WPA2 with RADIUS* on page 42

  WPA-PSK & WPA2-PSK uses a pre-shared key (PSK) for authentication; for more information, see the following sections:

  - *Configure and Enable Security Profiles* on page 36
  - *Configure WPA-PSK, WPA2-PSK, and WPA-PSK & WPA2-PSK* on page 43

Security Profiles

This section describes the main components of security profiles and explains how to configure and enable security profiles.

- *Security Profile Concepts*
- *Write Down Your Wireless Network Settings*
- *Configure and Enable Security Profiles*

Security profiles let you configure unique security settings for each SSID on each radio of the wireless access point. For each radio, the wireless access point supports up to eight security profiles (BSSIDs) that you can configure on the individual Edit Wireless Network screens that are accessible from the Edit Security Profile screen (see *Configure and Enable Security Profiles* on page 36).

Security Profile Concepts

Security profiles include the following main components:

- **Network authentication**
  The wireless access point is set by default as an open system with no authentication. When you configure network authentication, bear in mind that not all wireless adapters support WPA or WPA2. Consult the product documentation for your wireless adapter and WPA or WPA2 client software for instructions about how to configure WPA or WPA2 settings.

  For information about the types of network authentication that the wireless access point supports, see *Configure and Enable Security Profiles* on page 36.
- **Data encryption**
  The available data encryption options depend on the network authentication setting that you select (the default is no encryption). The data encryption settings are explained in *Configure and Enable Security Profiles* on page 36.
- **Wireless client security separation**
  If this feature is enabled, the associated wireless clients (using the same SSID) are not able to communicate with each other. This feature is useful for hotspots and other public access situations. By default, wireless client separation is disabled. For more information, see *Configure and Enable Security Profiles* on page 36.
- **VLAN ID**
  If this feature is enabled and if the network devices (hubs and switches) on your LAN support the VLAN (802.1Q) standard, the default VLAN ID for the wireless access point is associated with each profile. The default VLAN ID needs to match the IDs that are used by the other network devices. For more information, see *Configure and Enable Security Profiles* on page 36.

Some concepts and guidelines regarding the SSID are explained in the following list:

- A basic service set (BSS) consists of a group of wireless clients and a single wireless access point that use the same security profile or service set identifier (BSSID). The actual identifier in the BSSID is the MAC address of the wireless radio. (A wireless radio can have multiple MAC addresses, one for each security profile.)
- An extended service set (ESS) consists of a group of wireless clients and multiple wireless access points that use the same identifier (ESSID).
- Different wireless access points within an ESS can use different channels. To reduce interference, adjacent wireless access points should use different channels.
- Roaming is the ability of wireless clients to connect wirelessly when they physically move from one BSS to another one within the same ESS. The wireless client automatically changes to the wireless access point with the least interference or best performance.

Write Down Your Wireless Network Settings

For a new wireless network, print or copy the following form and fill in the settings. For an existing wireless network, the network administrator can provide this information.

Print the form and store the security information in a safe place:

- **SSID**. The service set identifier (SSID) identifies the wireless local area network. You can customize it by using up to 32 alphanumeric characters. Write your SSID on the line.

  SSID: ______________________________________

  The SSID in the wireless access point is the SSID you configure on the wireless adapter card. All wireless nodes in the same network need to be configured with the same SSID.

- **WEP key size and authentication**
  Choose the key size by circling one: 64, 128, or 152 bits.
  Choose the authentication type by circling one: open system or shared key.

  Passphrase: ______________________________________

  Note: If you select shared key, the other devices in the network cannot connect unless they are set to shared key and have the same keys in the same positions as those in the wireless access point.

- **WPA-PSK (pre-shared key) and WPA2-PSK**
  Record the WPA-PSK passphrase:

  WPA-PSK passphrase: ___________________________________

  Record the WPA2-PSK passphrase:

  WPA2-PSK passphrase: ___________________________________

- **WPA RADIUS settings**
  For WPA, record the following settings for the primary and secondary RADIUS servers:

  Server name or IP address: Primary ________________ Secondary _________________

  Port: ______________________________________

  Shared secret: ______________________________________

- **WPA2 RADIUS settings**
  For WPA2, record the following settings for the primary and secondary RADIUS servers:

  Server name/IP address: Primary _________________ Secondary __________________

  Port: ______________________________________

  Shared secret: ______________________________________

Configure and Enable Security Profiles

The wireless access point is set by default as an open system with no authentication. When you configure network authentication, bear in mind the following:

- If you are using access point mode (which is the default mode if you did not enable wireless bridging), all options are available. In other modes such as bridge mode, some options might be unavailable.
- Not all wireless adapters support WPA or WPA2. Consult the product documentation for your wireless adapter and WPA or WPA2 client software for instructions about how to configure WPA or WPA2 settings.

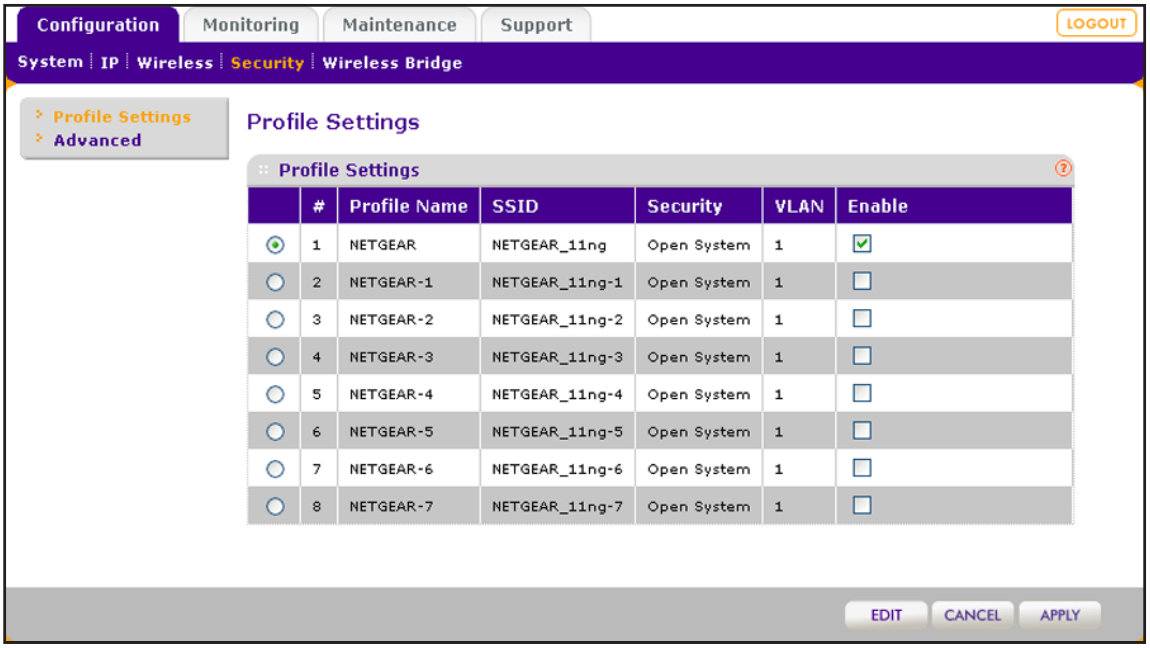
WARNING:

If you use a wireless computer to configure wireless security settings, you are disconnected when you click the Apply button. Reconfigure your wireless computer to match the new settings, or access the wireless access point from a wired computer to make further changes.

➢ **To configure and enable a security profile:**

1. Select **Configuration > Security > Profile Settings**.

   The Profile Settings screen displays eight wireless security profiles. (If the radio is disabled, the Enable column is masked out.)



Profile Settings

Profile Settings

	#	Profile Name	SSID	Security	VLAN	Enable
●	1	NETGEAR	NETGEAR_11ng	Open System	1	☑
○	2	NETGEAR-1	NETGEAR_11ng-1	Open System	1	□
○	3	NETGEAR-2	NETGEAR_11ng-2	Open System	1	□
○	4	NETGEAR-3	NETGEAR_11ng-3	Open System	1	□
○	5	NETGEAR-4	NETGEAR_11ng-4	Open System	1	□
○	6	NETGEAR-5	NETGEAR_11ng-5	Open System	1	□
○	7	NETGEAR-6	NETGEAR_11ng-6	Open System	1	□
○	8	NETGEAR-7	NETGEAR_11ng-7	Open System	1	□

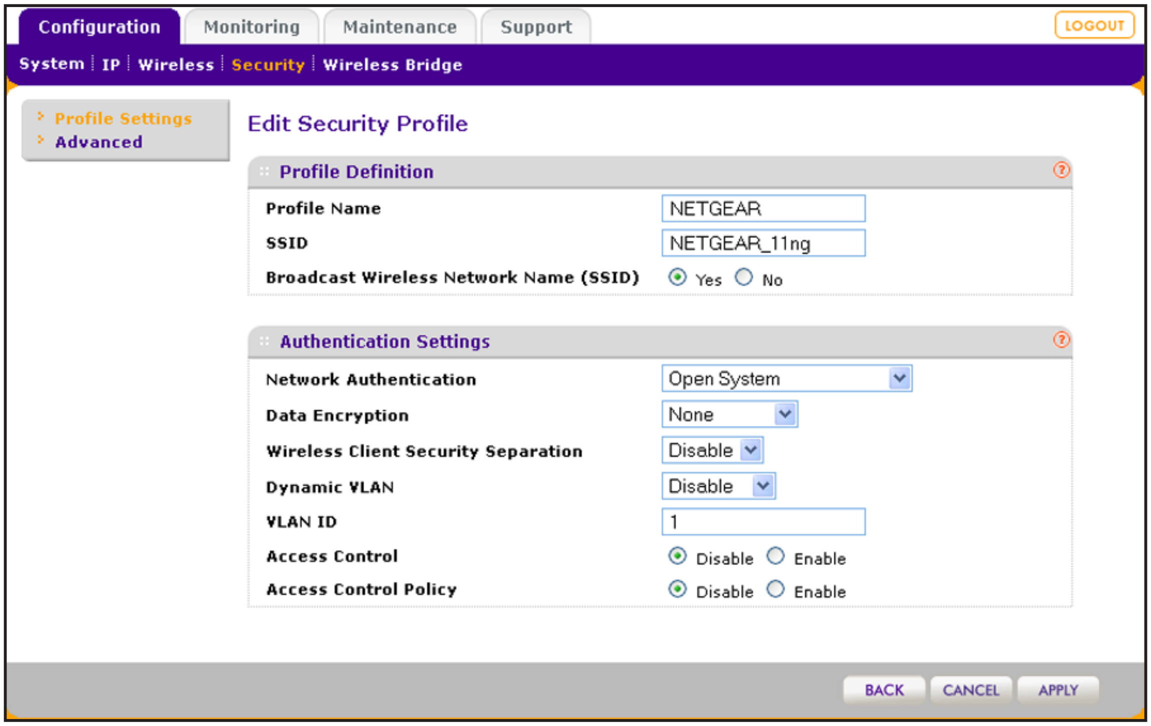
The following table explains the fields of the Profile Settings screen:

Setting	Description
Profile Name	The unique name of the wireless security profile that makes it easy to recognize the profile.
SSID	The wireless network name (SSID) for the wireless security profile.
Security	The configured wireless authentication method for the wireless security profile.
VLAN	The default VLAN ID that is associated with the wireless security profile.
Enable	The check box that lets you select the wireless security profile so you can enable it by clicking the **Apply** button.

2. Select the radio button to the left of the wireless security profile that you want to configure, and click the **Edit** button.

   The Edit Security Profile screen displays for the selected wireless security profile (see the following figure). The screen has two sections:

   - Profile Definition (see *Step 3*)
   - Authentication Settings (see *Step 4*)



Edit Security Profile

Profile Definition

Profile Name	NETGEAR
SSID	NETGEAR_11ng
Broadcast Wireless Network Name (SSID)	● Yes ○ No

Authentication Settings

Network Authentication	Open System
Data Encryption	None
Wireless Client Security Separation	Disable
Dynamic VLAN	Disable
VLAN ID	1
Access Control	● Disable ○ Enable
Access Control Policy	● Disable ○ Enable

3. Specify the settings of the Profile Definition section of the Edit Security Profile screen as described in the following table:

Setting	Description
Profile Name	Enter a unique name of the wireless security profile that makes it easy to recognize the profile. The default names are NETGEAR, NETGEAR-1, NETGEAR-2, and so on, through NETGEAR-7. You can enter a value of up to 32 alphanumeric characters.
SSID	The wireless network name (SSID) for the wireless security profile. The default names are NETGEAR_11ng, NETGEAR_11ng-1, NETGEAR_11ng-2, and so on, through NETGEAR_11ng-7 for the eighth profile.
Broadcast Wireless Network Name (SSID)	Select the **Yes** radio button to enable the wireless access point to broadcast its SSID, allowing wireless clients that have a null (blank) SSID to adopt the wireless access point's SSID. Yes is the default setting. To prevent the SSID from being broadcast, select the **No** radio button.

4. Specify the settings of the Authentication Settings section of the Edit Security Profile screen as described in the following table.

Setting	Description	
Network Authentication and Data Encryption **Note:** The data encryption fields that display onscreen depend on your selection from the Network Authentication drop-down menu.	Open System	This is the default setting. Use an open system without any encryption or with WEP encryption. For more information, see *Configure an Open System with WEP or Shared Key with WEP* on page 40.
	Shared Key	Use WEP encryption and enter at least one shared key. For more information, see *Configure an Open System with WEP or Shared Key with WEP* on page 40.
	Legacy 802.1X	Configure the RADIUS server settings. Encryption is not supported. For more information, see *Configure Legacy 802.1X* on page 42.
	WPA with Radius	Configure the RADIUS server settings and select TKIP or TKIP + AES encryption. For more information, see *Configure WPA with RADIUS, WPA2 with RADIUS, and WPA & WPA2 with RADIUS* on page 42.
	WPA2 with Radius	Configure the RADIUS server settings and select AES or TKIP + AES encryption. For more information, see *Configure WPA with RADIUS, WPA2 with RADIUS, and WPA & WPA2 with RADIUS* on page 42. **Note:** Select this setting only if all clients support WPA2.

Setting	Description	
Network Authentication and Data Encryption (continued)	WPA & WPA2 with Radius	Configure the RADIUS server setting. TKIP + AES encryption is the default encryption. For more information, see *Configure WPA with RADIUS, WPA2 with RADIUS, and WPA & WPA2 with RADIUS* on page 42. **Note:** This setting allows clients to connect through either WPA with TKIP or WPA2 with AES.
	WPA-PSK	Enter a WPA passphrase and select TKIP or TKIP + AES encryption. For more information, see *Configure WPA-PSK, WPA2-PSK, and WPA-PSK & WPA2-PSK* on page 43.
	WPA2-PSK	Enter a WPA passphrase and select AES or TKIP + AES encryption. For more information, see *Configure WPA-PSK, WPA2-PSK, and WPA-PSK & WPA2-PSK* on page 43. **Note:** Select this setting only if all clients support WPA2.
	WPA-PSK & WPA2-PSK	Enter a WPA passphrase. TKIP + AES encryption is the default encryption. For more information, see *Configure WPA-PSK, WPA2-PSK, and WPA-PSK & WPA2-PSK* on page 43. **Note:** This setting allows clients to connect through either WPA with TKIP or WPA2 with AES.
Wireless Client Security Separation	If you enable wireless client security separation by selecting Enable from the drop-down menu, the associated wireless clients cannot communicate with each other. By default, Disable is selected from the drop-down menu. This feature is intended for hotspots and other public access situations.	
Dynamic VLAN	From the drop-down menu, select how VLANs operate by making one of the following selections: • **Disable**. Disables dynamic VLANs, and enables static VLANs. This is the default setting. • **Optional**. Enables dynamic VLANs, but if a RADIUS server does not return a VLAN ID, the wireless client is still allowed to connect to the wireless access point. • **Required**. Enables dynamic VLANs. If a RADIUS server does not return a VLAN ID, the wireless client is not authenticated and cannot connect to the wireless access point. For dynamic VLANs to operate (that is, the selection is Optional or Required), the following is required: • The hubs and switches on your LAN need to support the VLAN (802.1Q) standard. • The authentication is set to any RADIUS type authentication: either the network authentication in the wireless security profile or the remote MAC address database authentication for the MAC Authentication feature can be used.	

Setting	Description
VLAN ID	Enter the VLAN ID to be associated with this wireless security profile. The default VLAN ID is 1. The VLAN ID needs to match the VLAN ID that is used by the other devices in your network.
Access Control	Access control functions only when static VLANs are enabled, that is, you select **Disable** from the Dynamic VLAN drop-down menu. The Access Control radio buttons let you enable or disable access control through a RADIUS server for the wireless security the profile: • **Disable**. Access control is disabled. This is the default setting. • **Enable**. Access control is enabled, and wireless clients are authenticated through a RADIUS server. Either the network authentication in the wireless security profile or the remote MAC address database authentication for the MAC Authentication feature needs to be enabled. **Note:** You can use access control even when you do not configure WPA with RADIUS or WPA2 with RADIUS.
Access Control Policy	Access control policy functions only when static VLANs are enabled, that is, you select **Disable** from the Dynamic VLAN drop-down menu and you select the **Enable** Access Control radio button. The Access Control Policy radio buttons let you enable or disable the access control policy for wireless clients: • **Disable**. If a RADIUS server does not return a (static) VLAN ID, the wireless client is still allowed to connect to the wireless access point. This is the default setting. • **Enable**. If a RADIUS server does not return a (static) VLAN ID, the wireless client is not authenticated and cannot connect to the wireless access point.

5. Click the **Apply** button.

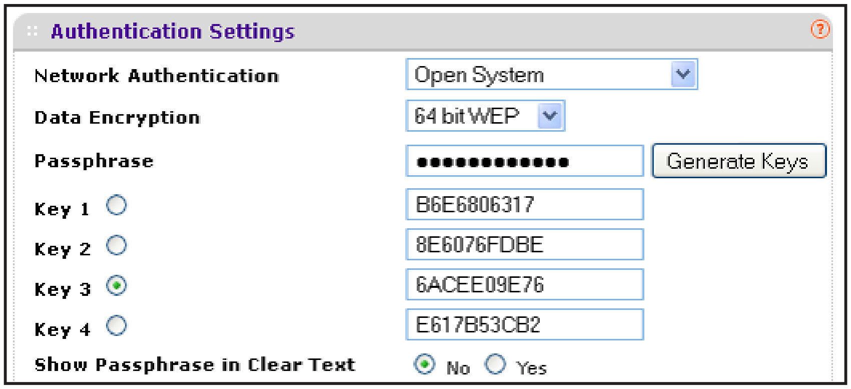
Configure an Open System with WEP or Shared Key with WEP

Whether you use an open system with WEP or shared key with WEP, configure the settings that are explained in *Table 2* on page 41.

- **Open system with WEP**

  An open system can function without any encryption or with pre-shared WEP key encryption without RADIUS authentication. The security level of static WEP is not very strong.

  When you select Open System from the Network Authentication drop-down menu and any selection other than None from the Data Encryption drop-down menu, the screen expands to display the WEP fields:



Authentication Settings

Network Authentication: Open System

Data Encryption: 64 bit WEP

Passphrase: ●●●●●●●●●●●●● Generate Keys

Key 1 ○ B6E6806317

Key 2 ○ 8E6076FDBE

Key 3 ● 6ACEE09E76

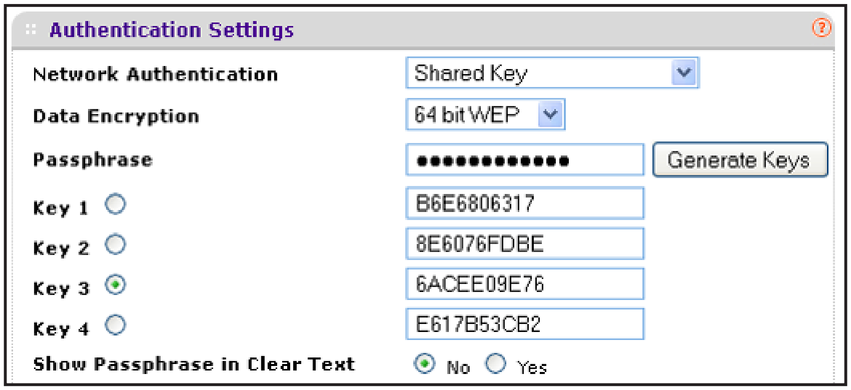
Key 4 ○ E617B53CB2

Show Passphrase in Clear Text: ● No ○ Yes

Figure 7. Open system with WEP

- **Shared key with WEP**

  Shared key provides pre-shared WEP key encryption without RADIUS authentication. The security level of static WEP is not very strong. When you select Shared Key from the Network Authentication drop-down menu, the screen expands to display the WEP fields:



Authentication Settings

Network Authentication: Shared Key

Data Encryption: 64 bit WEP

Passphrase: ●●●●●●●●●●●●● Generate Keys

Key 1 ○ B6E6806317

Key 2 ○ 8E6076FDBE

Key 3 ● 6ACEE09E76

Key 4 ○ E617B53CB2

Show Passphrase in Clear Text: ● No ○ Yes

Figure 8. Shared key with WEP

Table 2. WEP encryption settings

Setting	Descriptions
Data Encryption	Select the encryption key size from the drop-down menu: • **64-bit WEP**. Standard WEP encryption, using 40/64-bit encryption. • **128-bit WEP**. Standard WEP encryption, using 104/128-bit encryption. • **152-bit WEP**. Proprietary WEP encryption mode, using 128+24 bit encryption. This mode functions only with other wireless clients that support this mode.
Passphrase	Enter a passphrase. The passphrase length needs to be between 8 and 63 characters (inclusive). The secret passphrase allows you to generate the keys automatically by clicking the **Generate Keys** button. The default passphrase is sharedsecret. You can display the actual passphrase by selecting the Show Passphrase in Clear Text **Yes** radio button.

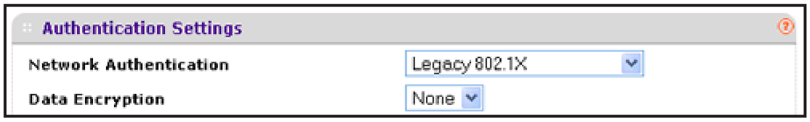
Table 2. WEP encryption settings (continued)

Setting	Descriptions
Encryption Key (Key1–Key4)	Specify the active key by selecting one of the four radio buttons. Only one key can be the active key. Either enter a key manually or allow the key to be automatically generated by clicking the **Generate Keys** button. The length of the key depends on the selected encryption: • For ASCII format, depending on the key size selected, the manually entered encryption key needs to have a length of 5 (64-bit WEP), 13 (128-bit WEP), or 16 characters (152-bit WEP). • For HEX format, depending on the key size selected, the manually entered or automatically generated encryption key needs to have a length of 10 (64-bit WEP), 26 (128-bit WEP), or 32 (152-bit WEP) characters. **Note:** Wireless clients need to use the key to access the wireless access point.
Show Passphrase in Clear Text	Select the **Yes** radio button to display the actual passphrase in the Passphrase field. The default setting is No.

Configure Legacy 802.1X

To use legacy 802.1X security, you need to define RADIUS server settings. For information about RADIUS servers, see *Configure RADIUS Server Settings* on page 45.

When you select Legacy 802.1X from the Network Authentication drop-down menu, the Data Encryption drop-down menu is automatically set to None. To use legacy 802.1X security, you need to define the RADIUS servers only.



Authentication Settings

Network Authentication: Legacy 802.1X

Data Encryption: None

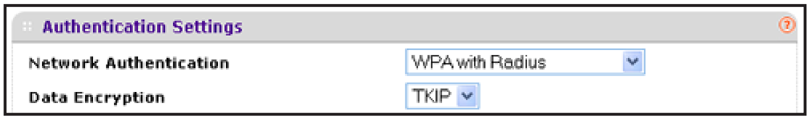
Figure 9. Legacy 802.1X

Configure WPA with RADIUS, WPA2 with RADIUS, and WPA & WPA2 with RADIUS

WPA, WPA2, and WPA & WPA2 security requires RADIUS-based 802.1x authentication, so you also need to define RADIUS server settings. For information about RADIUS servers, see *Configure RADIUS Server Settings* on page 45.

The selections that are available from the Data Encryption drop-down menu depend on the type of WPA authentication that you select from the Network Authentication drop-down menu and are shown in the table that follows the figures.

- **WPA with RADIUS**



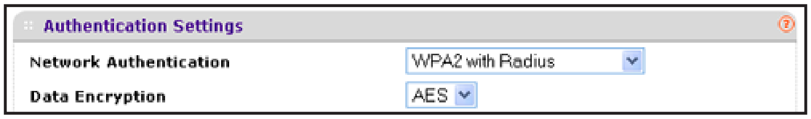
Authentication Settings

Network Authentication: WPA with Radius

Data Encryption: TKIP

Figure 10. WPA with RADIUS

- **WPA2 with RADIUS**



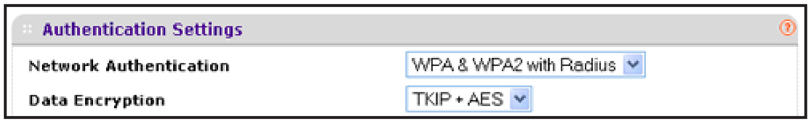
Authentication Settings

Network Authentication: WPA2 with Radius

Data Encryption: AES

Figure 11. WPA2 with RADIUS

- **WPA & WPA2 with RADIUS**



Authentication Settings

Network Authentication: WPA & WPA2 with Radius

Data Encryption: TKIP + AES

Figure 12. WPA & WPA2 with RADIUS

Table 3. Settings for WPA with RADIUS, WPA2 with RADIUS, and WPA & WPA2 with RADIUS

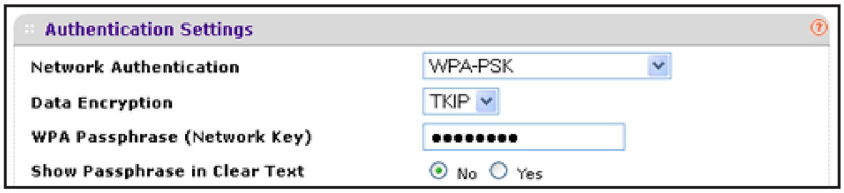
Setting	Descriptions
TKIP	Temporal Key Integrity Protocol (TKIP) is the standard encryption method used with WPA. You can also use TKIP with WPA2. **Note:** TKIP provides only legacy (slower) rates of operation. If you want to use the 11n rates and speed, NETGEAR recommends WPA2 authentication with AES encryption.
AES	Advanced Encryption Standard (AES) is the standard encryption method used with WPA2. **Note:** Although some wireless clients might support AES with WPA, the wireless access point does not support WPA with AES.
TKIP + AES	The TKIP + AES encryption method is supported both for WPA and WPA2. Broadcast packets use TKIP. For unicast (point-to-point) transmissions, WPA clients use TKIP, and WPA2 clients use AES. For the WPA & WPA2 mixed mode, TKIP + AES is the only supported data encryption method.

Configure WPA-PSK, WPA2-PSK, and WPA-PSK & WPA2-PSK

WPA-PSK, WPA-PSK, and WPA-PSK & WPA2-PSK authentication uses a pre-shared key (PSK, also called a passphrase or a network key) and does not require authentication from a RADIUS server.

The selections that are available from the Data Encryption drop-down menu depend on the type of WPA-PSK authentication that you select from the Network Authentication drop-down menu and are shown in the table that follows the figures.

- **WPA-PSK**



Authentication Settings

Network Authentication: WPA-PSK

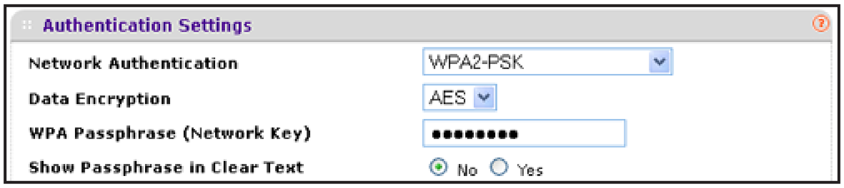
Data Encryption: TKIP

WPA Passphrase (Network Key): ●●●●●●●●

Show Passphrase in Clear Text: ● No ○ Yes

Figure 13. WPA-PSK

- **WPA2-PSK**

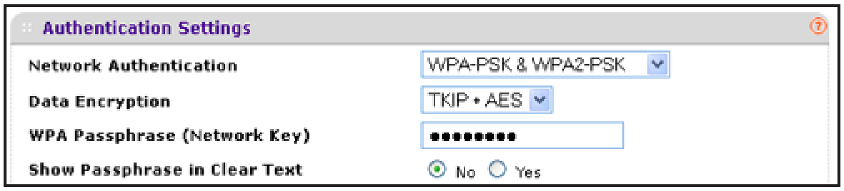


Authentication Settings

Network Authentication	WPA2-PSK
Data Encryption	AES
WPA Passphrase (Network Key)	••••••••
Show Passphrase in Clear Text	● No ○ Yes

Figure 14. WPA2-PSK

- **WPA-PSK & WPA2-PSK**



Authentication Settings

Network Authentication	WPA-PSK & WPA2-PSK
Data Encryption	TKIP + AES
WPA Passphrase (Network Key)	••••••••
Show Passphrase in Clear Text	● No ○ Yes

Figure 15. WPA-PSK & WPA2-PSK

Table 4. Settings for WPA-PSK, WPA2-PSK, and WPA-PSK & WPA2-PSK

Setting	Descriptions	
Data Encryption	TKIP	Temporal Key Integrity Protocol (TKIP) is the standard encryption method used with WPA. You can also use TKIP with WPA2. **Note:** TKIP provides only legacy (slower) rates of operation. If you want to use the 11n rates and speed, NETGEAR recommends WPA2 authentication with AES encryption.
	AES	Advanced Encryption Standard (AES) is the standard encryption method used with WPA2. **Note:** Although some wireless clients might support AES with WPA, the WN203 wireless access point does not support WPA with AES.
	TKIP + AES	TKIP + AES supports both WPA and WPA2. Broadcast packets use TKIP. For unicast (point-to-point) transmissions, WPA clients use TKIP, and WPA2 clients use AES. For the WPA & WPA2 mixed mode, TKIP + AES is the only supported data encryption method.
Passphrase	Enter a passphrase. The passphrase length needs to be between 8 and 63 characters (inclusive). The default passphrase is sharedsecret. You can display the actual passphrase by selecting the Show Passphrase in Clear Text **Yes** radio button.	
Show Passphrase in Clear Text	Select the **Yes** radio button to display the actual passphrase in the Passphrase field. The default setting is No.	

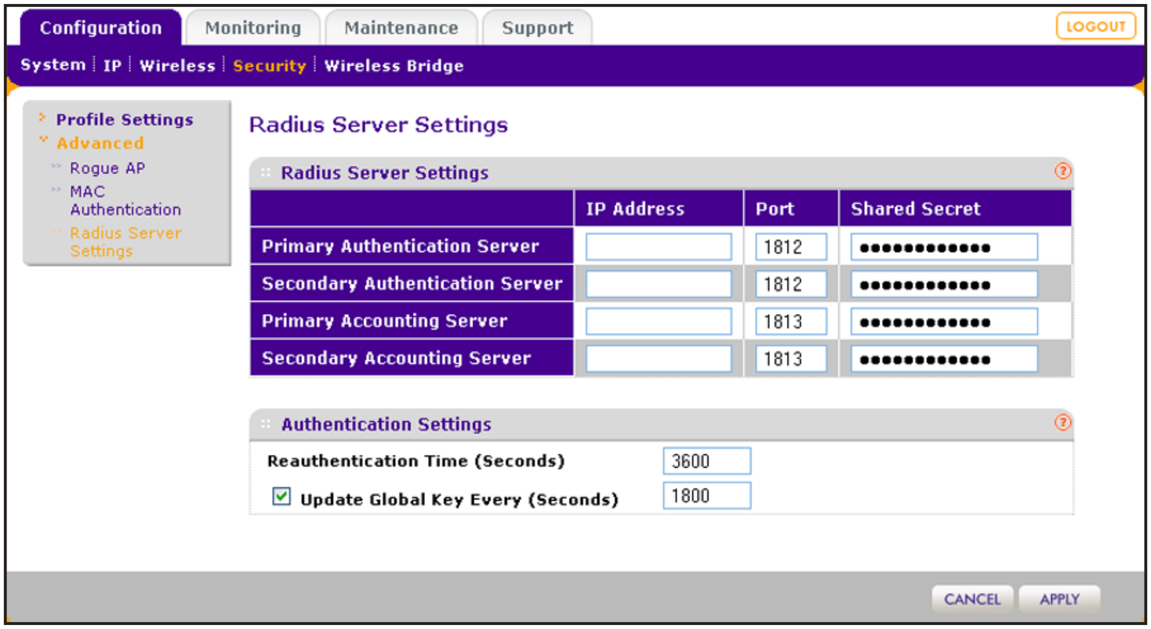
Configure RADIUS Server Settings

For authentication, accounting, or both authentication and accounting using RADIUS, you need to configure primary servers and optional secondary servers. These RADIUS server settings can apply to all devices that are connected to the wireless access point.

➢ **To configure the RADIUS server settings:**

1. Select **Configuration > Security > Advanced > Radius Server Settings**.

   The Radius Server Settings screen displays.



Radius Server Settings

Radius Server Settings

	IP Address	Port	Shared Secret
Primary Authentication Server		1812	●●●●●●●●●●●●
Secondary Authentication Server		1812	●●●●●●●●●●●●
Primary Accounting Server		1813	●●●●●●●●●●●●
Secondary Accounting Server		1813	●●●●●●●●●●●●

Authentication Settings

Reauthentication Time (Seconds) 3600

☑ Update Global Key Every (Seconds) 1800

2. Specify the settings as described in the following table:

Setting	Descriptions	
Radius Server Settings		
Primary Authentication Server	IP Address	Enter the IP address of the primary RADIUS server for authentication.
	Port	Enter the number of the UDP port on the wireless access point that is used to access the primary RADIUS server for authentication. The default port number is 1812.
	Shared Secret	Enter the shared key that is used between the wireless access point and the primary RADIUS server during authentication.

Setting	Descriptions	
Secondary Authentication Server	IP Address	Enter the IP address of the secondary RADIUS server for authentication. The secondary RADIUS server is used when the primary RADIUS server is not available.
	Port	Enter the number of the UDP port on the wireless access point that is used to access the secondary RADIUS server for authentication. The default port number is 1812.
	Shared Secret	Enter the shared key that is used between the wireless access point and the secondary RADIUS server during authentication.
Primary Accounting Server	IP Address	Enter the IP address of the primary RADIUS server for accounting.
	Port	Enter the number of the UDP port on the wireless access point that is used to access the primary RADIUS server for accounting. The default port number is 1813.
	Shared Secret	Enter the shared key that is used between the wireless access point and the primary RADIUS server during the accounting process.
Secondary Accounting Server	IP Address	Enter the IP address of the secondary RADIUS server for accounting. The secondary RADIUS server is used when the primary RADIUS server is not available.
	Port	Enter the number of the UDP port on the wireless access point that is used to access the secondary RADIUS server for accounting. The default port number is 1813.
	Shared Secret	Enter the shared key that is used between the wireless access point and the secondary RADIUS server during the accounting process.
Authentication Settings		
Reauthentication Time (Seconds)	The interval in seconds after which the supplicant is reauthenticated with the RADIUS server. The default interval is 3600 seconds (one hour). Enter **0** to disable reauthentication.	
Update Global Key Every (Seconds)	Select the check box to allow the global key update, and enter the interval in seconds. The check box is selected by default, and the default interval is 1800 seconds (30 minutes). Clear the check box to prevent the global key update.	

3. Click the **Apply** button.

Restrict Wireless Access by MAC Address

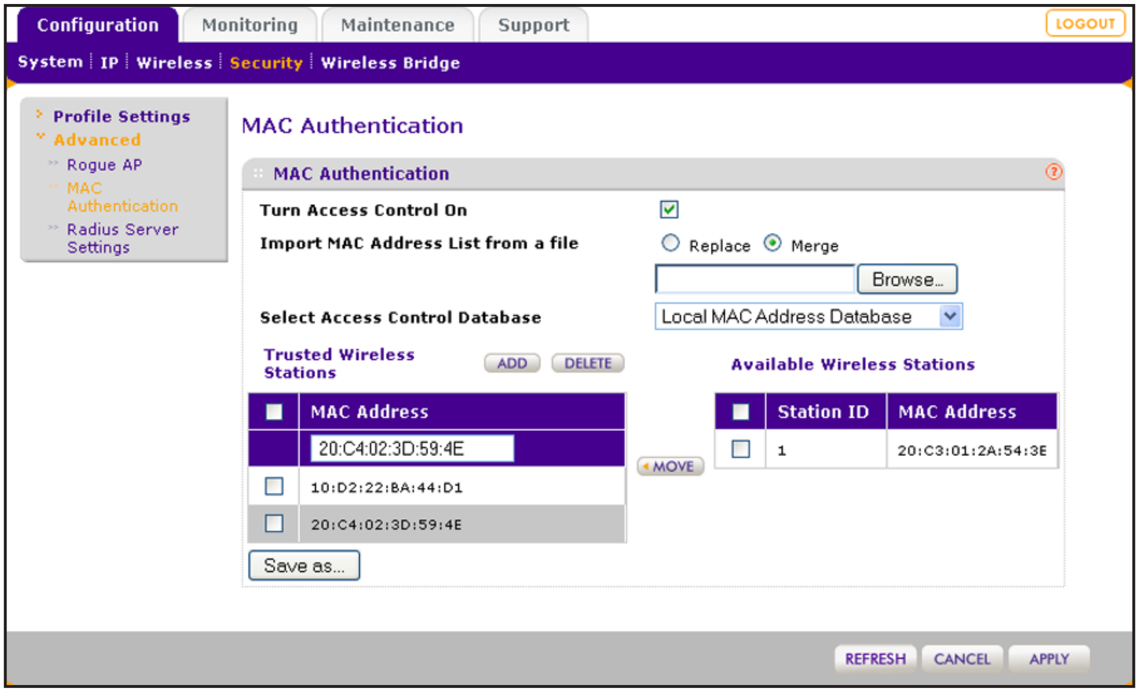
For increased security, you can restrict access to a wireless network by allowing access to only specific computers or wireless clients based on their MAC addresses. You can restrict access to only trusted computers so that unknown computers cannot connect wirelessly to the wireless access point. MAC address filtering adds an obstacle against unwanted access to your network, but the data broadcast over the wireless link is fully exposed.

Note: For wireless adapters, you can usually find the MAC address printed on the wireless adapter label.

➢ **To restrict access based on MAC addresses:**

1. Select **Configuration > Security > Advanced > MAC Authentication**.

   The MAC Authentication screen displays. (The following figure shows some examples.)



MAC Authentication

MAC Authentication

Turn Access Control On ☑

Import MAC Address List from a file ○ Replace ● Merge

Select Access Control Database: Local MAC Address Database

Trusted Wireless Stations

□	MAC Address
	20:C4:02:3D:59:4E
□	10:D2:22:BA:44:D1
□	20:C4:02:3D:59:4E

Available Wireless Stations

□	Station ID	MAC Address
□	1	20:C3:01:2A:54:3E

2. Select the **Turn Access Control On** check box.

   The access control feature is enabled.

3. From the Select Access Control Database drop-down menu, select one of the following database options:

   - **Local MAC Address Database**. The wireless access point uses the local MAC address database for access control. This is the default setting.
   - **Remote MAC Address Database**. The wireless access point uses the MAC address database on an external RADIUS server on the LAN for access control. If you select this database, you first need to configure the RADIUS server settings (see *Configure RADIUS Server Settings* on page 45).

4. Click the **Refresh** button.

   The Available Wireless Stations table is refreshed. The wireless access point places the MAC addresses of the attached wireless clients in this table.

5. Populate the Trusted Wireless Stations table with MAC addresses.

Depending on your network configuration, use one of the following three methods:

- **Select MAC addresses from the Available Wireless Stations table:**

  a. Select check boxes for individual MAC addresses or select the check box in the heading to select all MAC addresses.

  b. Click the **Move** button.

  The MAC addresses are transferred from the Available Wireless Stations table to the Trusted Wireless Stations table.

- **Enter MAC addresses manually:**

  a. Enter a MAC address directly in the Trusted Wireless Stations table.

  b. Click the **Add** button.

- **Import MAC addresses from a file:**

  a. Click the **Browse** button.

  b. Navigate to the file with MAC addresses.

  This file needs to be a simple text file with one MAC address per line.

  c. Select the file, and click the **Open** button.

  d. Use one of the following methods:

    - Select the **Replace** radio button.

      All MAC addresses that are in the Trusted Wireless Stations table are replaced with the MAC addresses that are in the file.

    - Select the **Merge** radio button.

      The MAC addresses from the file are added to the MAC addresses that are in the Trusted Wireless Stations table.

6. Click the **Apply** button.

   Now, only devices in the Trusted Wireless Stations table are allowed to connect to the wireless access point over a wireless connection.

⚠ WARNING:

When configuring the wireless access point from a wireless computer whose MAC address is not on the access control list, you lose your wireless connection when you click the Apply button. You then need to access the wireless access point from a wired computer or from a wireless computer that is on the access control list to make any further changes.

➢ **To delete selected or all MAC address from the Trusted Wireless Stations table:**

1. Select check boxes for individual MAC addresses or select the check box in the heading to select all MAC addresses.
2. Click the **Delete** button.

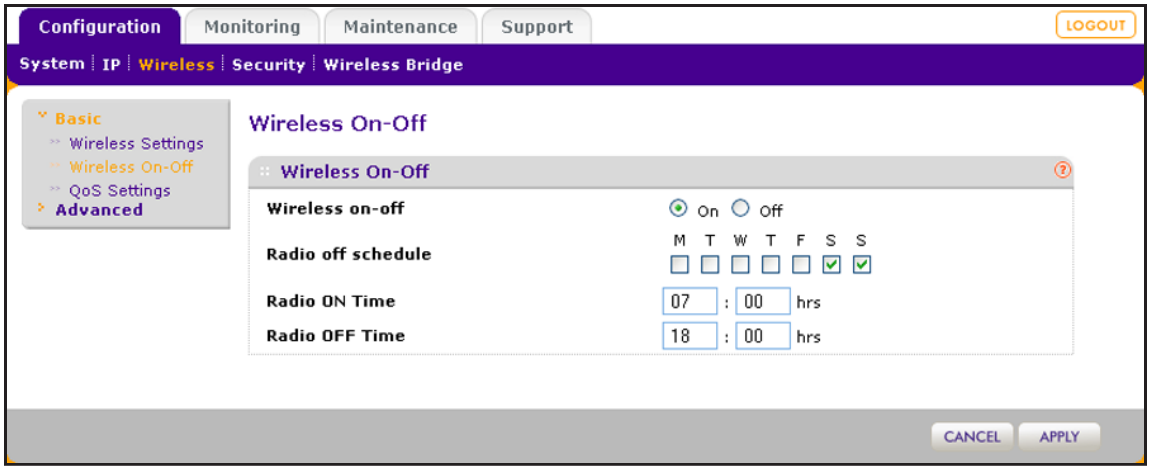
Schedule the Wireless Radios to Be Turned Off

Scheduling the wireless radios to be turned off is a green feature that allows you to turn off the wireless radios during scheduled vacations, office shutdowns, on evenings, or on weekends.

➢ **To schedule the radios to be turned on and off:**

1. Select **Configuration > Wireless > Basic > Wireless On-Off**.

   The Wireless On-Off screen displays:



Wireless On-Off

Wireless On-Off

Wireless on-off ● On ○ Off

Radio off schedule M T W T F S S □ □ □ □ □ ☑ ☑

Radio ON Time 07 : 00 hrs

Radio OFF Time 18 : 00 hrs

2. Specify the settings as described in the following table:

Setting	Description
Wireless on-off	Select the **On** radio button to enable the timer. By default, the Off radio button is selected.
Radio off schedule	Select check boxes to specify the days when you want to schedule the radios to be turned off. By default, Saturday and Sunday are selected.
Radio ON Time	Enter the time that you want the radios to be turned back on. Use 24-hour time format.
Radio OFF Time	Enter the time that you want the radios to be turned off. Use 24-hour time format.

3. Click the **Apply** button.

Configure Basic Wireless Quality of Service

Wi-Fi Multimedia (WMM) is a subset of the 802.11e standard. WMM allows wireless traffic to have a range of priorities, depending on the type of data. Time-dependent information, such as video or audio, has a higher priority than normal traffic. For WMM to function correctly, wireless clients also need to support WMM.

By enabling WMM, you allow Quality of Service (QoS) control for upstream traffic flowing from a wireless client to the wireless access point and for downstream traffic flowing from the wireless access point to a wireless client.

WMM defines the following four queues in decreasing order of priority:

- **Voice**. The highest priority queue with minimum delay, which makes it ideal for applications like VoIP and streaming media.
- **Video**. The second highest priority queue with low delay is given to this queue. Video applications are routed to this queue.
- **Best Effort**. The medium priority queue with medium delay is given to this queue. Most standard IP applications use this queue.
- **Background**. Low priority queue with high throughput. Applications that are not time-sensitive but require high throughput, such as FTP, can use this queue.

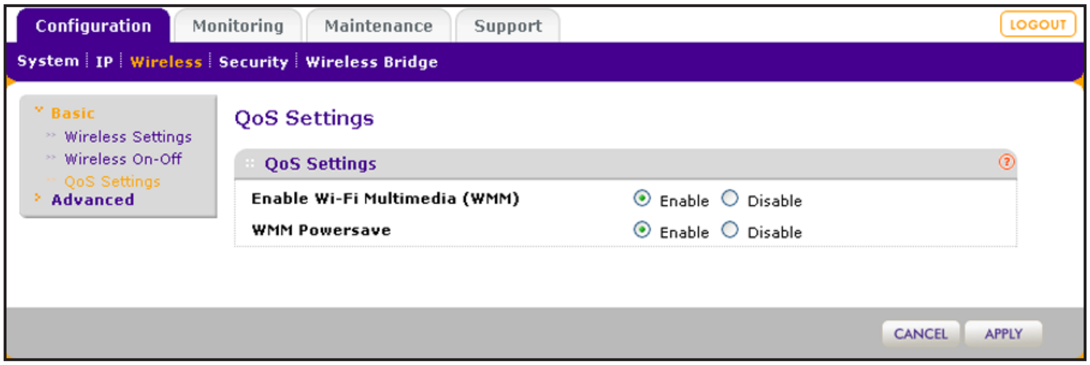
The WMM Powersave feature saves power for battery-powered equipment by increasing the efficiency and flexibility of data transmission.

For information about how to configure advanced wireless QoS, that is, to configure specific Enhanced Distributed Channel Access (EDCA) settings, see *Configure Advanced Quality of Service Settings* on page 73.

➢ To configure basic wireless QoS:

1. Select **Configuration > Wireless > Basic > QoS Settings**.

   The basic QoS Settings screen displays:



Enable Wi-Fi Multimedia (WMM) ● Enable ○ Disable

WMM Powersave ● Enable ○ Disable

2. Enable or disable the WMM features:
   - **Enable Wi-Fi Multimedia (WMM)**. To enable this feature, select the **Enable** radio button.

     By default, this feature is enabled. Select the **Disable** radio button to disable the feature.
   - **WMM Powersave**. To enable this feature, select the **Enable** radio button, which is the default setting.

     By default, this feature is enabled. Select the **Disable** radio button to disable the feature.
3. Click the **Apply** button.

4. Management

4

This chapter describes how to use the management features of the wireless access point. The chapter includes the following sections:

- *Enable Remote Management*
- *Upgrade the Wireless Access Point Software*
- *Manage the Configuration File or Reset to Factory Default*
- *Change the Administrator Password*
- *Enable the Syslog Option*
- *Enable Rogue AP Detection and Monitor Access Points*

Enable Remote Management

This section describes the different options for remote management.

- *SNMP Management*
- *Secure Shell and Telnet Management*

Both Simple Network Management Protocol (SNMP) and the remote console Secure Shell (SSH) are enabled by default, which allows for remote management of the wireless access point from a client running SNMP management software, as well as from an SSH client. The Telnet console is disabled by default.

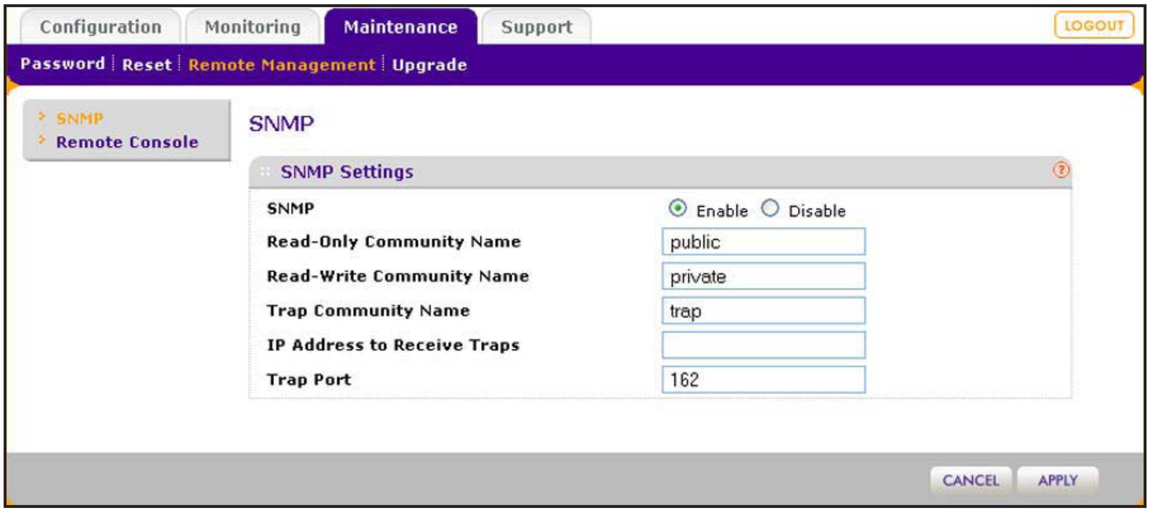
SNMP Management

The SNMP screen lets you configure the IP address of the SNMP manager, the community names, and the trap information.

➢ **To set up an SNMP management interface:**

1. Select **Maintenance > Remote Management > SNMP**.

   The SNMP screen displays:



SNMP

SNMP Settings

SNMP	● Enable ○ Disable
Read-Only Community Name	public
Read-Write Community Name	private
Trap Community Name	trap
IP Address to Receive Traps	
Trap Port	162

2. Specify the settings as described in the following table:

Setting	Description
SNMP	Select the **Enable** radio button to allow the SNMP network management software, such as HP OpenView, to manage the wireless access point through SNMPv1/v2 protocol. By default, the Disable radio button is selected.
Read-Only Community Name	Enter the community string to allow the SNMP manager to read the wireless access point’s Management Information Base (MIB) objects. The default is public.

Setting	Description
Read-Write Community Name	Enter the community string to allow the SNMP manager to read and write the wireless access point’s MIB objects. The default is private.
Trap Community Name	Enter the community string to allow the SNMP manager to send traps. The default is trap.
IP Address to Receive Traps	Enter the IP address of the SNMP manager to receive traps sent from the wireless access point.
Trap Port	Enter the number of the SNMP manager port to receive traps sent from the wireless access point. The default is 162.

3. Click the **Apply** button.

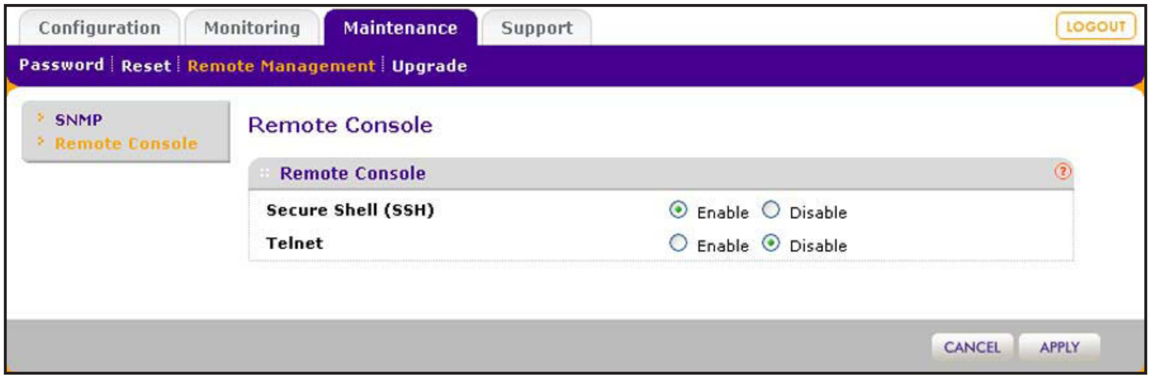
Secure Shell and Telnet Management

By default, Secure Shell (SSH) is enabled and Telnet is disabled.

➢ **To configure remote console features:**

1. Select **Maintenance > Remote Management > Remote Console**.

   The Remote Console screen displays:



Remote Console

Remote Console

Secure Shell (SSH) ● Enable ○ Disable

Telnet ○ Enable ● Disable

2. Enable or disable the remote console features:
   - **Secure Shell (SSH)**. By default, you can make an SSH connection to the wireless access point. Select the **Disable** button to prevent SSH connections from being made.
   - **Telnet**. By default, you cannot make a Telnet connection to the wireless access point. Select the **Enable** radio button to allow Telnet connections to be made.
3. Click the **Apply** button.

➢ **To manage the wireless access point over an SSH or Telnet connection:**

1. Start an SSH or Telnet session to the wireless access point using an application such as PuTTY, if such an encryption application is allowed by law in your country.
2. Enter the login name and password (**admin** and **password** are the defaults).

After successful login, the **>** prompt displays, preceded by the name of the wireless access point.

3. Enter the CLI commands that you want to use.

   You can enter **?** to display the available CLI commands. The CLI commands are also listed in *Appendix B, Command-Line Reference*.

Upgrade the Wireless Access Point Software

The software of the wireless access point is stored in flash memory and can be upgraded as NETGEAR releases new software. You can download upgrade files from the NETGEAR website. If the upgrade file is compressed (.zip file or .rar file), you first need to extract the image file (.bin file) before sending it to the wireless access point. You can send the upgrade file using your browser. The following sections describe the two methods that are available to perform a software upgrade:

- *Web Browser Upgrade Procedure*
- *TFTP Server Upgrade Procedure*

Note: The web browser that you use to upload new firmware into the wireless access point needs to support HTTP uploads. Use a browser such as Microsoft Internet Explorer 8.0 or later, or Mozilla Firefox 18.0 or later.

Note: You cannot perform the software upgrade from a computer that is connected to the wireless access point over a wireless link. You need to use a computer that is connected to the wireless access point over an Ethernet cable.

⚠ **WARNING:**

When uploading software to the wireless access point, do *not* interrupt the web browser by closing the window, clicking a link, or loading a new page. If the browser is interrupted, the upload might fail, corrupt the software, and render the wireless access point inoperable.

IMPORTANT:

In some cases, such as a major upgrade, you might need to erase the configuration and manually reconfigure your wireless access point after upgrading it. To find out if you need to reconfigure the wireless access point, see the release notes included with the software.

Web Browser Upgrade Procedure

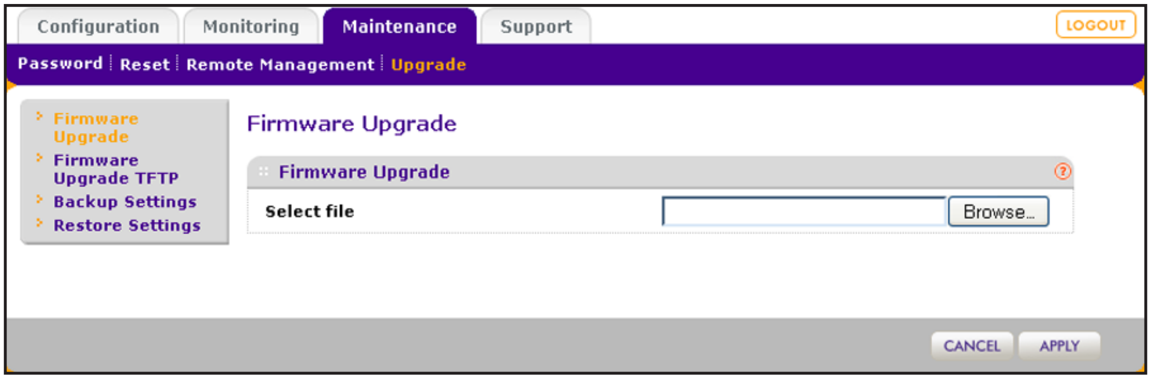
Upgrading firmware through a web browser is the most common upgrade method.

➢ **To use a web browser to upgrade the wireless access point firmware:**

1. Download the new software file from the NETGEAR website and save it to your hard disk.
2. If necessary, unzip the new software file.

   If the file is zipped, it is a .zip or .rar file.
3. If available, read the release notes before upgrading the software.
4. Select **Maintenance > Upgrade > Firmware Upgrade**.

   The Firmware Upgrade screen displays:



5. Click the **Browse** button and locate the image upgrade file (.bin file).
6. Click the **Apply** button.

   The upgrade process is initiated.

   During the upgrade process, the wireless access point automatically restarts, and the Test LED blinks amber. The upgrade process typically takes several minutes. When the Test LED turns off, wait a few more seconds before doing anything with the wireless access point.
7. Verify that the new software file has been installed by selecting **Monitoring > System**.

   The System screen displays (see *View System Information* on page 92). The firmware version is shown in the Access Point Information section of the screen.

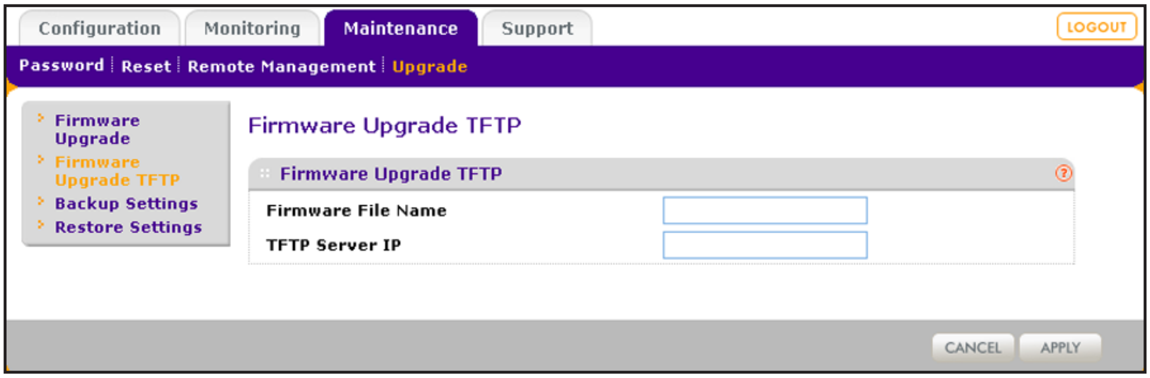
TFTP Server Upgrade Procedure

To use this method, you need to have a TFTP server set up.

➢ **To use a TFTP server to upgrade the wireless access point firmware:**

1. Download the new software file from the NETGEAR website and save it to your hard disk.
2. Place the software file in your TFTP server location. (You do not need to unzip the file.)
3. If available, read the release notes before upgrading the software.
4. Select **Maintenance > Upgrade > Firmware Upgrade TFTP**.

   The Firmware Upgrade TFTP screen displays:



5. Specify the following information:
   - **Firmware File Name**. The name of the unzipped software file.
   - **TFTP Server IP**. The IP address of your TFTP server.
6. Click the **Apply** button.

   The upgrade process is initiated.

   During the upgrade process, the wireless access point automatically restarts, and the Test LED blinks amber. The upgrade process typically takes several minutes. When the Test LED turns off, wait a few more seconds before doing anything with the wireless access point.
7. Verify that the new software file has been installed by selecting **Monitoring > System**.

   The System screen displays (see *View System Information* on page 92). The firmware version is shown in the Access Point Information section of the screen.

Manage the Configuration File or Reset to Factory Default

The wireless access point settings are stored in the configuration file. You can save this file (back it up) to a computer, restore it from a computer, or reset it to factory default settings.

- *Save the Configuration*
- *Restore the Configuration*
- *Restore the Wireless Access Point to the Factory Default Settings*
- *Reboot the Wireless Access Point without Restoring the Default Configuration*

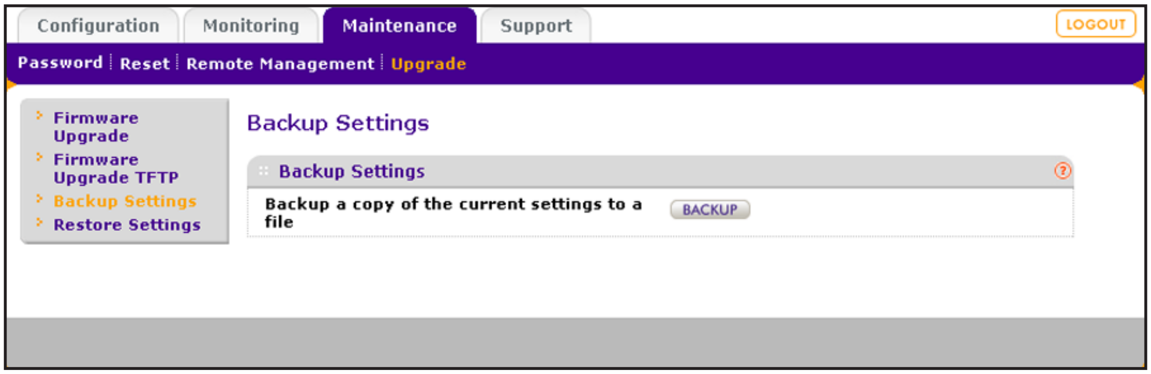
Save the Configuration

After you change the configuration, NETGEAR recommends that you back up the configuration.

➢ **To save your settings:**

1. Select **Maintenance > Upgrade > Backup Settings**.

   The Backup Settings screen displays.



2. Click the **Backup** button.

   Your browser extracts the configuration file (the file name is config) from the wireless access point and prompts you for a location on your computer to store the file.

3. Follow the instructions of your browser to save the file.

Restore the Configuration

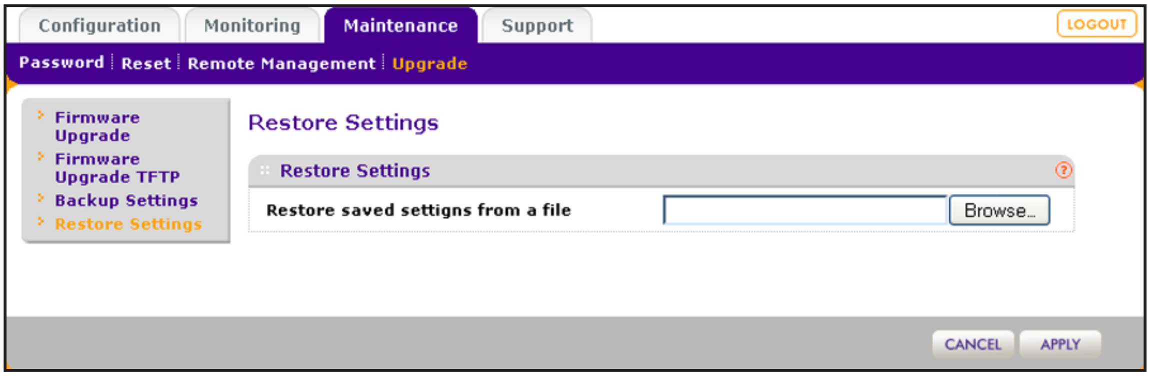
IMPORTANT:

During the restoration process, do not try to go online, turn off the wireless access point, shut down the computer, or do anything else to the wireless access point until it finishes restarting!

➤ **To restore your settings from a saved configuration file:**

1. Select **Maintenance > Upgrade > Restore Settings**.

   The Restore Settings screen displays:



Restore saved settings from a file

2. Click the **Browse** button.
3. Locate the backup configuration file (the file name is config).
4. Click the **Apply** button.

   The restoration process is initiated. During the restoration process, the wireless access point automatically restarts. The restoration process typically takes about one minute. When the Test LED turns off, wait a few more seconds before doing anything with the wireless access point.

Restore the Wireless Access Point to the Factory Default Settings

You can restore the wireless access point to the factory default settings by two methods that are described in the following sections:

- *Use the Web Management Interface to Restore Factory Default Settings*
- *Use the Reset to Factory Defaults Button to Restore Factory Default Settings*

Note: After you have restored the factory default settings on the wireless access point:
* All custom configurations are lost.
* The login password is **password**.
* The default LAN IP address is **192.168.0.100**.
* The DHCP client is disabled.
* The Access Point Name field is reset to the name printed on the label of the unit.

For more information about the factory default settings, see *Factory Default Settings* on page 108.

Use the Web Management Interface to Restore Factory Default Settings

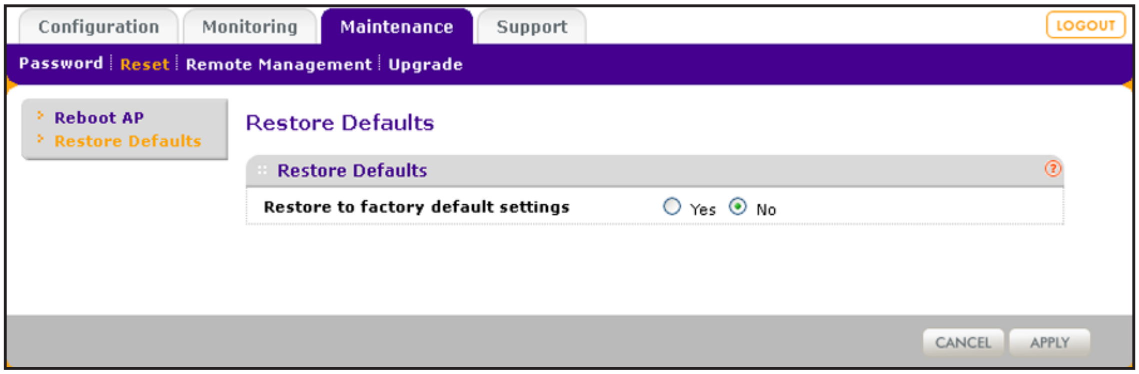
IMPORTANT:

During the restoration process, do not try to go online, turn off the wireless access point, shut down the computer, or do anything else to the wireless access point until it finishes restarting!

➢ **To restore the factory default settings using the web management interface:**

1. Select **Maintenance > Reset > Restore Defaults**.

   The Restore Defaults screen displays:



Restore to factory default settings ○ Yes ● No

2. Select the **Yes** radio button.

   By default, the No radio button is selected.

3. Click the **Apply** button.

   The wireless access point resets to the factory default settings.

During the restoration process, the wireless access point automatically restarts. The restoration process typically takes about one minute. When the Test LED turns off, wait a few more seconds before doing anything with the wireless access point.

Use the Reset to Factory Defaults Button to Restore Factory Default Settings

To restore the factory default settings when you do not know the login user name, login password, or IP address, you need to use the Reset to Factory Defaults button on the bottom panel of the wireless access point (see *Figure 3* on page 13).

➢ **To restore the factory default settings using the Reset to Factory Defaults button:**

1. Using a sharp object, press and hold the **Reset to Factory Defaults** button for about 10 seconds to reset the wireless access point to factory default settings.

> **Note:** Pressing the Reset to Factory Defaults button for a few seconds simply causes the wireless access point to reboot.

2. Release the **Reset to Factory Defaults** button.

   During the restoration process, the wireless access point automatically restarts. The restoration process typically takes about one minute. When the Test LED turns off, wait a few more seconds before doing anything with the wireless access point.

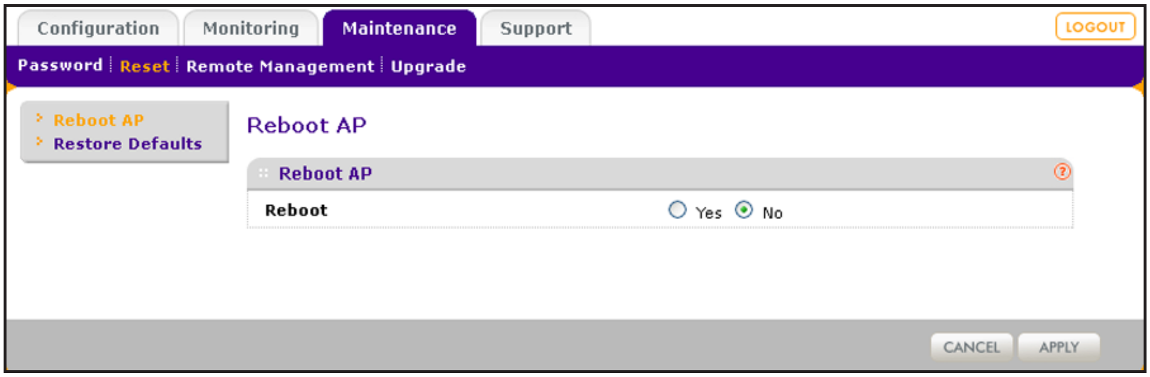
Reboot the Wireless Access Point without Restoring the Default Configuration

If you do not have physical access to the wireless access point to switch it off and on again, you can use the software to reboot the wireless access point.

➢ **To reboot the wireless access point:**

1. Select **Maintenance > Reset > Reboot AP**.

   The Reboot AP screen displays:



Reboot AP

Reboot AP

Reboot ○ Yes ● No

2. Select the **Yes** radio button.

   By default, the No radio button is selected.

3. Click the **Apply** button.

   The wireless access point reboots and the Test LED lights amber. The reboot process typically takes about one minute. When the Test LED turns off, wait a few more seconds before doing anything with the wireless access point.

Change the Administrator Password

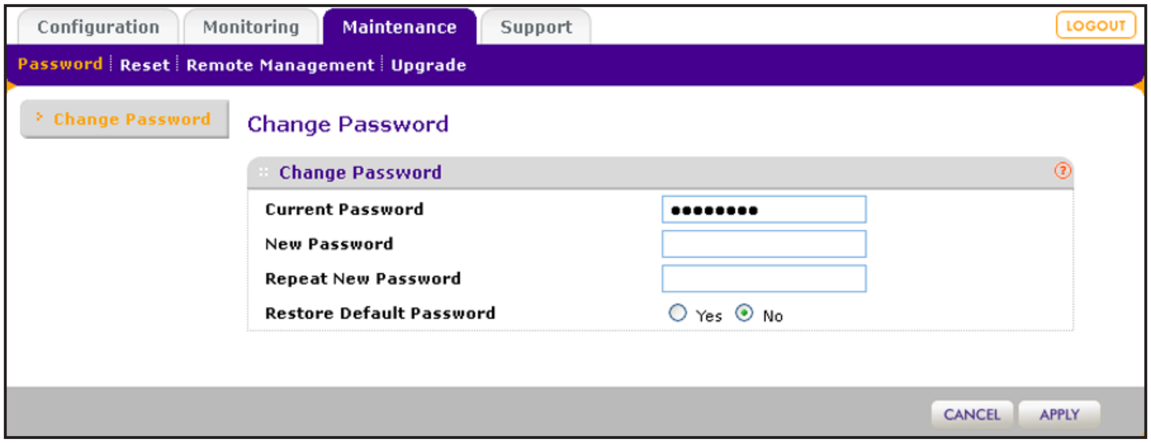
The default password is **password**. NETGEAR recommends that you change this password to a more secure password. You cannot change the administrator login name (admin).

The ideal password contains no dictionary words from any language and is a mixture of uppercase and lowercase letters, numbers, and symbols. Your password can be up to 30 characters.

➢ **To change the administrator password:**

1. Select **Maintenance > Password > Change Password**.

   The Change Password screen displays:



Change Password

Change Password

Current Password	●●●●●●●●
New Password	
Repeat New Password	
Restore Default Password	○ Yes ● No

2. Take one of the following actions:
   - Enter a new password twice, once in the New Password field and again in the Repeat New Password field.
   - Next to Restore Default Password, select the **Yes** radio button to restore the default password. By default, the No radio button is selected.

3. Click the **Apply** button.

   If you have restored the default password, the login password is **password**. If you have configured a new password, write it down in a secure place.

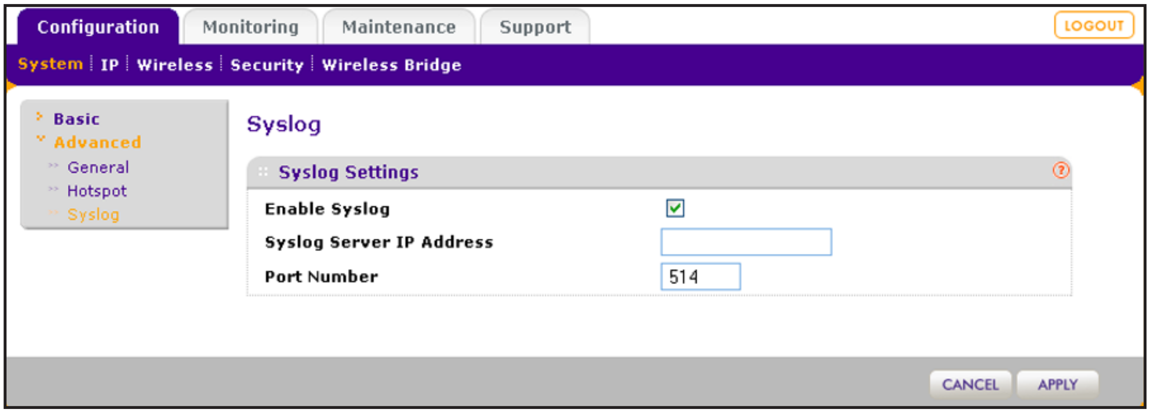
Enable the Syslog Option

If you have a syslog server on your LAN, the Syslog screen allows you to enable the syslog option. If syslog is enabled, the wireless access point sends its syslog files to the syslog server.

➢ **To enable a syslog option:**

1. Select **Configuration > System > Advanced > Syslog**.

   The Syslog screen displays:



Syslog

Syslog Settings

Enable Syslog ☑

Syslog Server IP Address

Port Number 514

2. Specify the settings as described in the following table:

Setting	Description
Enable Syslog	Select the check box to enable the syslog option. By default, the syslog option is disabled.
Syslog Server IP Address	Enter the IP address of the syslog server to which the wireless access point sends the syslog files.
Port Number	Enter the port number that is configured on the syslog server. The default port number is 514.

3. Click the **Apply** button.

Enable Rogue AP Detection and Monitor Access Points

This section describes how to use the Rogue AP detection feature to provide more security in your wireless network.

- *Enable and Configure Rogue AP Detection*
- *View and Save Access Point Lists*

Enable and Configure Rogue AP Detection

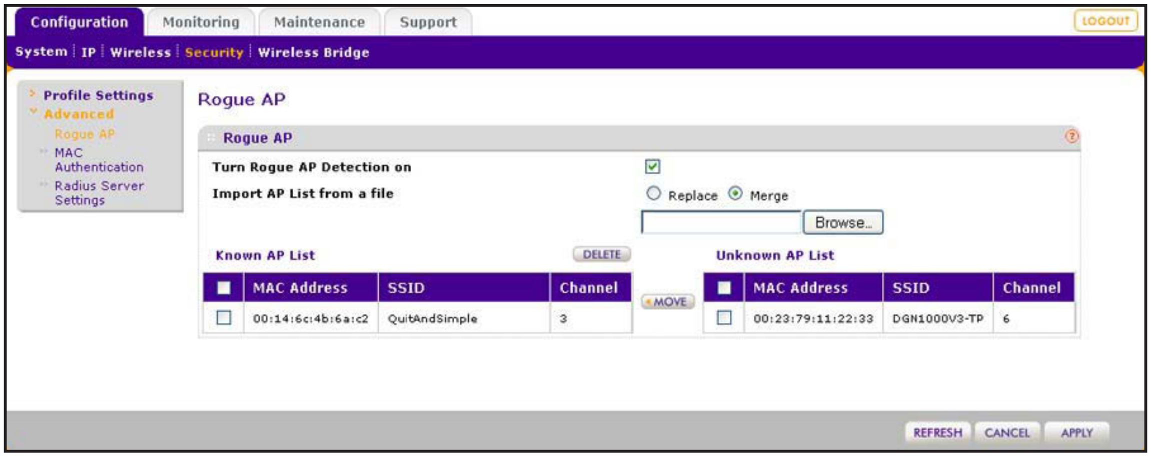
The wireless access point can detect rogue access points and prevent them from connecting to the wireless access point. The wireless access point maintains a list of access points it detects in the area. Initially, all detected access points are displayed in the Unknown AP List. You restrict communication to approved access points by adding them to the Known AP List and enabling the rogue AP detection feature.

If you enable rogue AP detection, the wireless access point continuously scans the wireless network and collects information about all access points on its channel.

➢ **To enable and configure rogue AP detection:**

1. Select **Configuration > Security > Advanced > Rogue AP**.

   The Rogue AP screen displays. The following figure shows examples in the Known AP List and Unknown AP List.



Rogue AP

Rogue AP

Turn Rogue AP Detection on ☑

Import AP List from a file ○ Replace ● Merge

Known AP List

□	MAC Address	SSID	Channel
□	00:14:6c:4b:6a:c2	QuitAndSimple	3

Unknown AP List

□	MAC Address	SSID	Channel
□	00:23:79:11:22:33	DGN1000V3-TP	6

2. Select the **Turn Rogue AP Detection On** check box.
3. (Optional) Click the **Refresh** button.

   The wireless access point detects unknown access points and populates the Unknown AP List.

4. In the Unknown AP List, select individual check boxes for access points or select the check box in the column heading to select all access points.
5. Click the **Move** button.

   Access points are transferred from the Unknown AP List to the Known AP List.

6. Click the **Apply** button.

➢ **To remove APs from the Known AP List and return them to the Unknown AP List:**

1. In the Known AP List, select individual check boxes for access points or select the check box in the column heading to select all access points.
2. Click the **Delete** button.
3. Click the **Refresh** button.

The wireless access point detects the removed access points and repopulates the Unknown AP List.

➢ **To import a file with a precompiled list of access points into the Known AP List:**

1. Take one of the following actions:
   - Select the **Replace** radio button.

     The imported list of access points replaces the existing Known AP List.
   - Select the **Merge** radio button.

     The imported list of access points is added to the existing Known AP List.
2. Click the **Browse** button.
3. Locate the file that contains the list of access points.

   This file needs to be a simple text file with one MAC address per line.
4. Select the file, and click the **Open** button.
5. Click the **Apply** button.

   The list of access points is uploaded to the Known AP List.

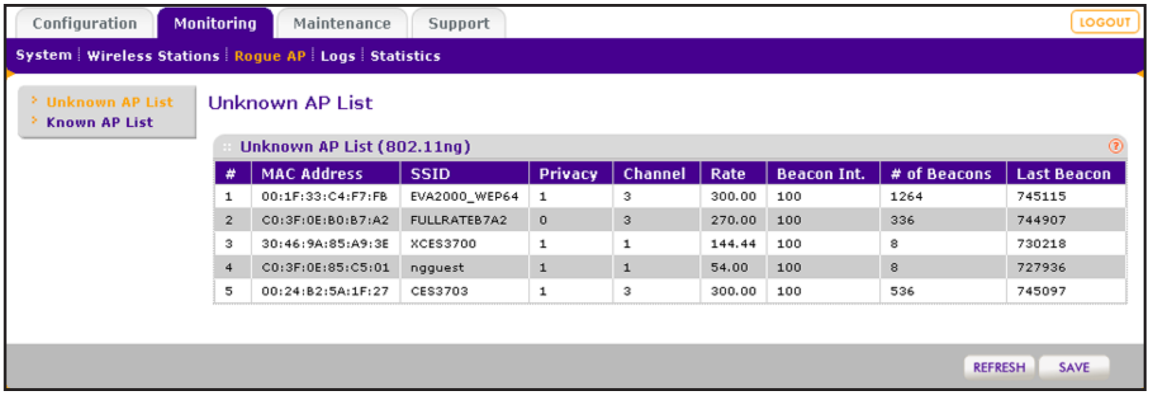
View and Save Access Point Lists

The wireless access point detects nearby APs and wireless clients and maintains them in a list. You can use this list to prevent them from connecting to the wireless access point.

➢ **To view the Unknown AP List and save it to a file:**

1. Select **Monitoring > Rogue AP > Unknown AP List**.

   The Unknown AP List screen displays:



Unknown AP List (802.11ng)

#	MAC Address	SSID	Privacy	Channel	Rate	Beacon Int.	# of Beacons	Last Beacon
1	00:1F:33:C4:F7:FB	EVA2000_WEP64	1	3	300.00	100	1264	745115
2	C0:3F:0E:B0:B7:A2	FULLRATEB7A2	0	3	270.00	100	336	744907
3	30:46:9A:85:A9:3E	XCES3700	1	1	144.44	100	8	730218
4	C0:3F:0E:85:C5:01	ngguest	1	1	54.00	100	8	727936
5	00:24:B2:5A:1F:27	CES3703	1	3	300.00	100	536	745097

2. (Optional) Click the **Refresh** button.

   The wireless access point detects the access points and populates the Unknown AP List for the configured wireless modes.

The following table explains the fields of the Unknown AP List screen:

Setting	Description
MAC Address	The MAC address of the unknown AP.
SSID	The SSID that the unknown AP is using.
Privacy	Indicates whether security is enabled (1 means enabled; 0 means disabled).
Channel	The channel that the unknown AP is using.
Rate	The transmit data rate in Mbps of the unknown the AP.
Beacon Int.	The interval for each beacon transmission in ms.
# of Beacons	The number of beacons transmitted by the unknown AP that the wireless access point has detected.
Last Seen	The time stamp that indicates the time when the most recent beacon was detected.

3. Click the **Save** button.

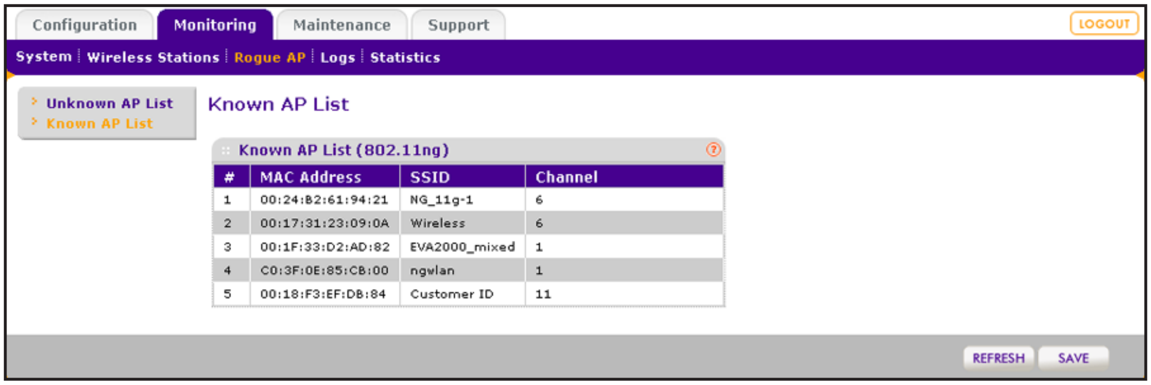
   Export the list of unknown APs to a file. A window opens so you can browse to the location where you want to save the file. The default file name is macList.txt.

4. (Optional) After you have reviewed the list, import the saved list into the Known AP List on the Rogue AP screen (see *Enable and Configure Rogue AP Detection* on page 63).

➢ **To view the Known AP Lists and save it to a file:**

1. Select **Monitoring > Rogue AP > Known AP List**.

   The Known AP List screen displays:



Known AP List (802.11ng)

#	MAC Address	SSID	Channel
1	00:24:B2:61:94:21	NG_11g-1	6
2	00:17:31:23:09:0A	Wireless	6
3	00:1F:33:D2:AD:82	EVA2000_mixed	1
4	C0:3F:0E:85:CB:00	ngwlan	1
5	00:18:F3:EF:DB:84	Customer ID	11

2. (Optional) Click the **Refresh** button.

   The wireless access point detects the access points and populates the Known AP List for the configured wireless modes.

The following table explains the fields of the Known AP List screen:

Setting	Description
MAC Address	The MAC address of the known AP.
SSID	The SSID that the known AP is using.
Channel	The channel that the known AP is using.

3. Click the **Save** button.

   Export the list of known APs to a file. A window opens so you can browse to the location where you want to save the file. The default file name is macList.txt.

5. Advanced Configuration

5

This chapter describes how to configure the advanced features of the wireless access point. The chapter includes the following sections:

- *Configure Spanning Tree Protocol and 802.1Q VLANs*
- *Configure Hotspot Settings*
- *Configure Advanced Wireless Settings*
- *Configure Advanced Quality of Service Settings*
- *Configure Wireless Bridging*

Configure Spanning Tree Protocol and 802.1Q VLANs

Spanning Tree Protocol (STP) provides network traffic optimization in locations where multiple wireless access points are active by preventing path redundancy. If you have more than one active wireless access point at your location, NETGEAR recommends that you enable STP.

The 802.1Q VLAN protocol on the wireless access point logically separates traffic on the same physical network:

- **Untagged VLAN**. When the wireless access point sends frames that are associated with the untagged VLAN from its Ethernet interface, those frames are untagged. When the wireless access point receives untagged frames over its Ethernet interface, those frames are assigned to the untagged VLAN.

Note: Use an untagged VLAN only if the hubs and switches on your LAN support the 802.1Q VLAN protocol. Likewise, change the untagged VLAN value only if the hubs and switches on your LAN support the 802.1Q VLAN protocol.

- **Tagged VLAN**. When you clear the Untagged VLAN check box, the wireless access point tags all frames that are sent from its Ethernet interface. Only incoming frames that are tagged with known VLAN IDs are accepted.
- **Management VLAN**. The management VLAN can be active only when the wireless access point functions as a point-to-point or point-to-multipoint bridge (see *Configure Wireless Bridging* on page 75). The management VLAN is used for managing traffic (Telnet, SNMP, and HTTP) to and from the wireless access point.

  Frames belonging to the management VLAN are not given any 802.1Q header when they are sent over the trunk. If a port is in a single VLAN, it can be untagged. However, if the port is a member of multiple VLANs, it needs to be tagged.

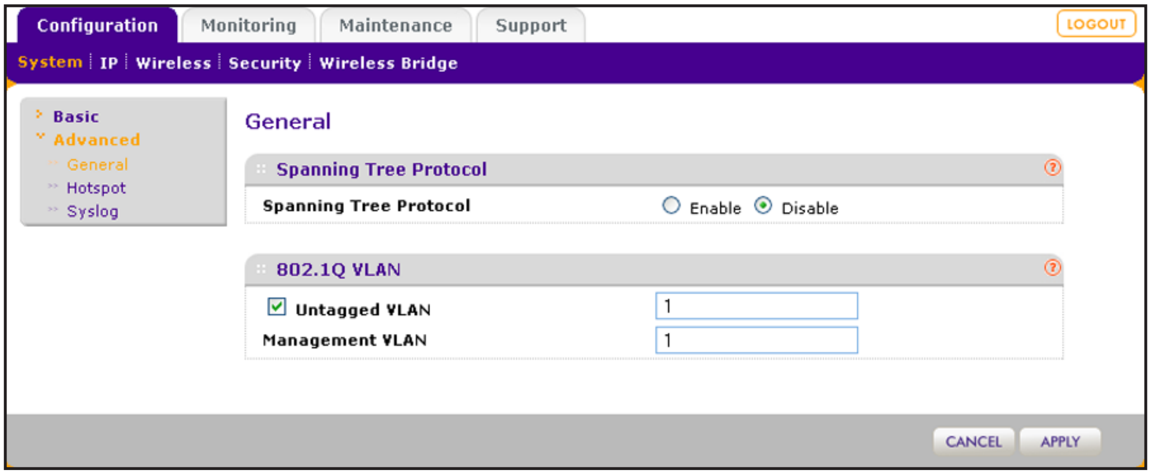
WARNING:

Selecting the Untagged VLAN check box or changing the untagged VLAN value causes loss of IP connectivity if the hubs and switches on your LAN have not yet been configured with the corresponding VLAN.

➢ To configure STP and VLANs:

1. Select **Configuration > System > Advanced > General**.

   The advanced General system settings screen displays:



General

Spanning Tree Protocol

Spanning Tree Protocol ○ Enable ● Disable

802.1Q VLAN

☑ Untagged VLAN 1

Management VLAN 1

2. Specify the settings as described in the following table:

Setting	Description
Spanning Tree Protocol	
Spanning Tree Protocol	Select the **Enable** radio button to enable STP to prevent path redundancy. By default, the Disable radio button is selected.
802.1Q VLAN	
Untagged VLAN	Select the **Untagged VLAN** check box to configure one VLAN as an untagged VLAN. By default, the Untagged VLAN check box is selected. Specify a VLAN ID. The default VLAN ID is 1.
Management VLAN	Specify an ID for the VLAN from which the wireless access point can be managed. The default VLAN ID is 1. **Note:** If you configure the management VLAN ID as 0 (zero), the wireless access point can be managed over any VLAN, and frames that belong to the management VLAN are not tagged with an 802.1Q header when sent over the trunk.

3. Click the **Apply** button.

Configure Hotspot Settings

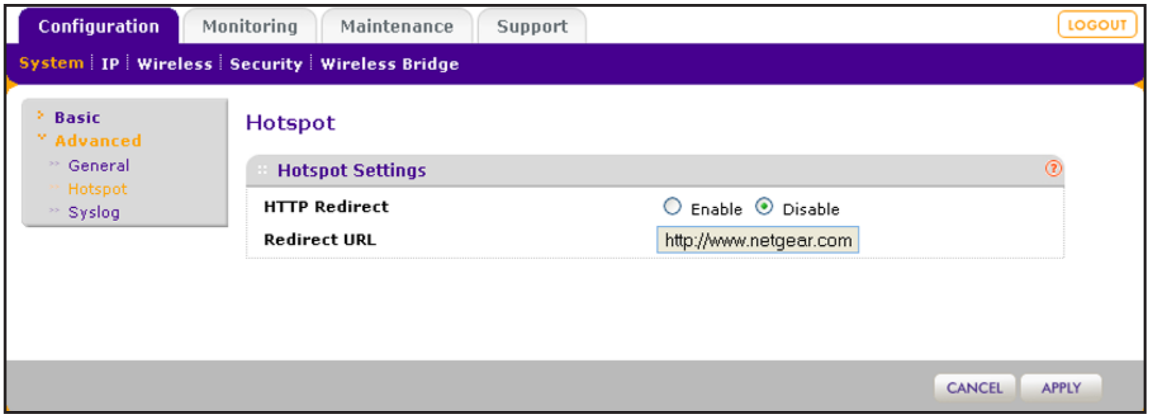
If the wireless access point functions as a public access point and you want it to capture and redirect all HTTP requests (over TCP, port 80), set up a hotspot server to redirect the requests to the specified URL and manage the clients. For example, you can redirect HTTP requests to a web server for authentication, timing control, or advertising. A hotel might want all wireless connections to go to its server to start a billing transaction.

Note: The redirection occurs only the first time that a wireless client opens a web browser.

➢ **To set up a hotspot server:**

1. Select **Configuration > System > Advanced > Hotspot**.

   The Hotspot screen displays:



Hotspot

Hotspot Settings

HTTP Redirect ○ Enable ● Disable

Redirect URL http://www.netgear.com

2. To enable HTTP redirection, select the **Enable** radio button.

   By default, HTTP redirection is disabled.

3. In the Redirect URL field, enter the URL of the web server to which you wish to redirect HTTP requests.
4. Click the **Apply** button.

   All HTTP requests are now redirected to the specified URL.

Configure Advanced Wireless Settings

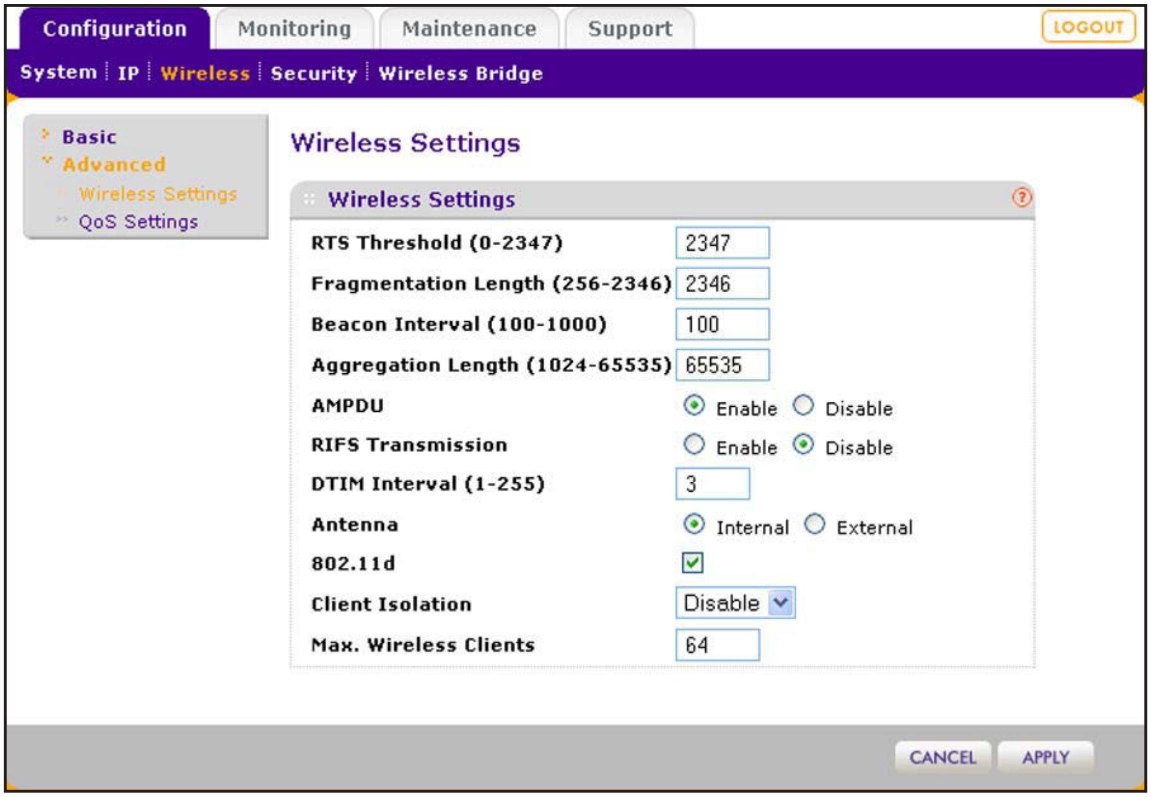
Use the advanced Wireless Settings screen to configure and enable various WLAN settings for the 802.11b/bg/ng modes.

The default WLAN settings normally work well. However, you can use the advanced settings to fine-tune the overall performance of the wireless access point for your specific environment. If a radio is turned off, you cannot configure the advanced wireless settings. Make sure that the radio is turned on.

➢ **To configure the advanced wireless settings:**

1. Select **Configuration > Wireless > Advanced > Wireless Settings**.

   The advanced Wireless Settings screen displays. The following figure shows the 11ng settings, as indicated by the radio wave icon (📶) that is displayed next to ng:



Wireless Settings

Wireless Settings

RTS Threshold (0-2347)	2347
Fragmentation Length (256-2346)	2346
Beacon Interval (100-1000)	100
Aggregation Length (1024-65535)	65535
AMPDU	● Enable ○ Disable
RIFS Transmission	○ Enable ● Disable
DTIM Interval (1-255)	3
Antenna	● Internal ○ External
802.11d	☑
Client Isolation	Disable
Max. Wireless Clients	64

2. Specify the settings as described in the following table:

Setting	Description
RTS Threshold (0–2347)	Enter the Request to Send (RTS) threshold. The default setting is 2347. If the packet size is equal to or less than the RTS threshold, the wireless access point uses the Carrier Sense Multiple Access with Collision Detection (CSMA/CD) mechanism, and the data frame is transmitted immediately after the silence period. If the packet size is larger than the RTS threshold, the wireless access point uses the CSMA with Collision Avoidance (CSMA/CA) mechanism. In this situation, the transmitting station sends an RTS packet to the receiving station and waits for the receiving station to return a Clear to Send (CTS) packet before sending the actual packet data.
Fragmentation Length (256–2346)	Enter the maximum packet size that is used for the fragmentation of data packets. Packets that are larger than the specified fragmentation length are broken up into smaller packets before being transmitted. The fragmentation length needs to be an even number. The default setting is 2346.
Beacon Interval	Enter the interval between 100 ms and 1000 ms for each beacon transmission, which allows the wireless access point to synchronize the wireless network. The default setting is 100.

Setting	Description
Aggregation Length (1024–65535) **Note:** This setting does not apply to the 802.11b/bg modes.	Enter the maximum length of aggregated MAC protocol data unit (A-MPDU) packets. Larger aggregation lengths could lead to better network performance. Aggregation is a mechanism used to achieve higher throughput. The default setting is 65535.
AMPDU **Note:** This setting does not apply to the 802.11b/bg modes.	Select the **Enable** radio button to allow the aggregation of several MAC frames into a single large frame to achieve higher throughput. Enabling the aggregated MAC protocol data unit (A-MPDU) could lead to better network performance. By default, the Enable radio button is selected.
RIFS Transmission **Note:** This setting does not apply to the 802.11b/bg modes.	Select the **Enable** radio button to allow transmission of successive frames at different transmit powers. Enabling reduced interframe space (RIFS) could lead to better network performance. By default, the Disable radio button is selected.
DTIM Interval (1–15)	Enter the delivery traffic indication message (DTIM) interval, also referred to as the data beacon rate, which indicates the beacon DTIM period in multiples of beacon intervals. This value needs to be between 1 and 15. The default setting is 3.
Antenna	Select one of the following radio buttons to specify the antenna: • **Internal**. Enables the internal antenna. This is the default setting. • **External**. Enables the optional external antennas.
Preamble Type **Note:** This setting applies only to the 802.11b and 802.11bg modes.	Select one of the following radio buttons to specify the preamble type for the 802.11b mode or 802.11bg mode: • **Long**. A long transmit preamble might provide a more reliable connection or a slightly longer range. A short transmit preamble gives better performance. • **Auto**. The Auto setting enables the wireless access point to handle both long and short preambles. The default setting is Auto.
802.11d	Select this check box to enable support for additional regulatory domains that are not in the current standard; support includes the addition of a country information element to beacons, probe requests, and probe responses. This check box is selected by default.
Client Isolation	From the drop-down menu, select one of the following options: • **Enable**. Communication between wireless clients that are associated to different virtual access points (VAPs) is blocked. • **Disable**. Communication between wireless clients that are associated to different VAPs is allowed. This is the default setting.
Max. Wireless Clients	Enter the maximum number of wireless clients that can simultaneously connect to the wireless access point at one time. The default setting is 64 clients.

3. Click the **Apply** button.

Configure Advanced Quality of Service Settings

For most networks, the default Quality of Service (QoS) queue settings work well. For information about how to configure basic QoS, see *Configure Basic Wireless Quality of Service* on page 49.

You can specify the settings on multiple queues for increased throughput and better performance of differentiated wireless traffic such as voice over IP (VoIP), other types of audio, video, and streaming media, as well as traditional IP data.

The advanced QoS options on the wireless access point are as follows:

- **AP EDCA parameters**. Specify the access point (AP) Enhanced Distributed Channel Access (EDCA) settings for different types of data transmitted from the wireless access point to wireless clients.
- **Station EDCA parameters**. Specify the station EDCA parameters for different types of data transmitted from the wireless clients to the wireless access point. If WMM is disabled, you cannot configure the Station EDCA parameters. (For information about how to enable WMM, see *Configure Basic Wireless Quality of Service* on page 49.)

When you configure the EDCA settings, the wireless access point can leverage existing information in the IP packet header that is related to the Type of Service (ToS). The wireless access point examines the ToS field in the headers of all packets that it processes. Based on the value in a packet’s ToS field, the wireless access point prioritizes the packet for transmission by assigning it to one of the queues. A different type of data is associated with each queue. You can configure how the wireless access point treats each queue.

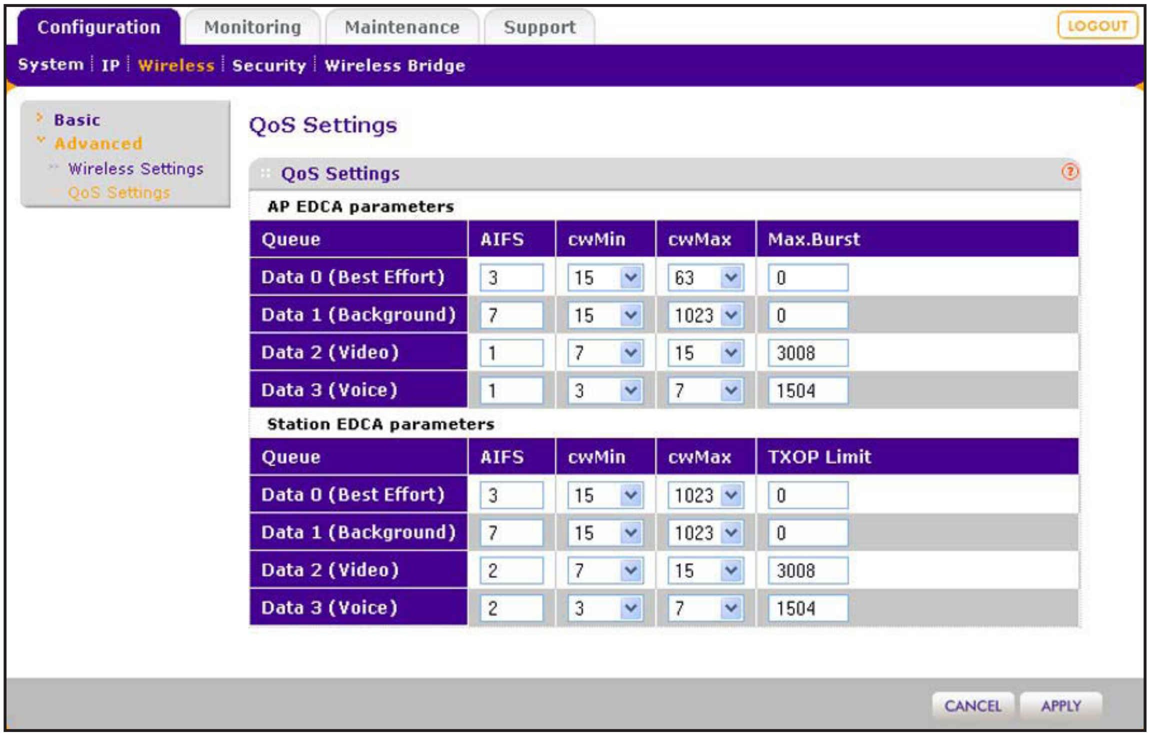
The queues defined for different types of data transmitted from AP-to-station and station-to-AP are:

- **Data 0 (Best Effort)**. Medium priority queue, medium throughput and delay. Most traditional IP data is sent to this queue.
- **Data 1 (Background)**. Lowest priority queue, high throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
- **Data 2 (Video)**. Highest priority queue, minimum delay. Time-sensitive video data is automatically sent to this queue.
- **Data 3 (Voice)**. Highest priority queue, minimum delay. Time-sensitive data such as VoIP and streaming media are automatically sent to this queue.

➢ **To configure advanced QoS:**

1. Select **Configuration > Wireless > Advanced > QoS Settings**.

   The advanced QoS Settings screen displays:



QoS Settings

QoS Settings

AP EDCA parameters

Queue	AIFS	cwMin	cwMax	Max.Burst
Data 0 (Best Effort)	3	15	63	0
Data 1 (Background)	7	15	1023	0
Data 2 (Video)	1	7	15	3008
Data 3 (Voice)	1	3	7	1504

Station EDCA parameters

Queue	AIFS	cwMin	cwMax	TXOP Limit
Data 0 (Best Effort)	3	15	1023	0
Data 1 (Background)	7	15	1023	0
Data 2 (Video)	2	7	15	3008
Data 3 (Voice)	2	3	7	1504

2. Specify the settings as described in the following table:

Setting	Description
AP EDCA parameters	
AIFS	Enter the Arbitration Inter-Frame Spacing (AIFS) interval that specifies the wait time (in milliseconds) between data frames. A higher AIFS value means a higher priority for a queue. Valid values for AIFS are 0 through 8. The default values are Data 0: 3; Data 1: 7; Data 2: 1; Data 3: 1.
cwMin	Enter the minimum contention window (cwMin) value that specifies the upper limit (in milliseconds) of a range from which the initial random back-off wait time is determined. Decreasing this value increases the priority of the queue. The value for cwMin needs to be lower than the value for cwMax. Valid values are 0, 1, 3, 7, 15, 31, 63, 127, 255, 511, and 1023. The default values are Data 0: 15; Data 1: 15; Data 2: 7; Data 3: 3.
cwMax	Enter the maximum contention window (cwMax) value that specifies the upper limit (in milliseconds) for the doubling of the random back-off value. Decreasing this value increases the priority of the queue. The value for cwMax needs to be higher than the value for cwMin. Valid values are 0, 1, 3, 7, 15, 31, 63, 127, 255, 511, and 1023. The default values are Data 0: 63; Data 1: 1023; Data 2: 15; Data 3: 7.
Max. Burst	Enter the maximum burst value that specifies the maximum burst length (in microseconds) allowed for packet bursts on the wireless network. A packet burst is a collection of multiple frames transmitted without header information. Decreasing this value increases the priority of the queue. Valid values for maximum burst length are all multiples of 32 between 0 and 8192, inclusive of 0 and 8192. The default values are Data 0: 0; Data 1: 0; Data 2: 3008; Data 3: 1504.

Setting	Description
Station EDCA parameters	
AIFS	Enter the Arbitration Inter-Frame Spacing (AIFS) interval that specifies the wait time (in milliseconds) between data frames. A higher AIFS value means a higher priority for a queue. Valid values for AIFS are 0 through 8. The default values are Data 0: 3; Data 1: 7; Data 2: 2; Data 3: 2.
cwMin	Enter the minimum contention window (cwMin) value that specifies the upper limit (in milliseconds) of a range from which the initial random back-off wait time is determined. Decreasing this value increases the priority of the queue. The value for cwMin needs to be lower than the value for cwMax. Valid values are 0, 1, 3, 7, 15, 31, 63, 127, 255, 511, and 1023. The default values are Data 0: 15; Data 1: 15; Data 2: 7; Data 3: 3.
cwMax	Enter the maximum contention window (cwMax) value that specifies the upper limit (in milliseconds) for the doubling of the random back-off value. Decreasing this value increases the priority of the queue. The value for cwMax needs to be higher than the value for cwMin. Valid values are 0, 1, 3, 7, 15, 31, 63, 127, 255, 511, and 1023. The default values are Data 0: 1023; Data 1: 1023; Data 2: 15; Data 3: 7.
TXOP Limit	Enter the transmission opportunity (TXOP) value that specifies the time interval (in microseconds) in which a client station can initiate transmissions on the wireless medium (WM). Decreasing this value increases the priority of the queue. Valid values for TXOP Limit are all multiples of 32 between 0 and 8192, inclusive of 0 and 8192. The default values are Data 0: 0; Data 1: 0; Data 2: 3008; Data 3: 1504.

3. Click the **Apply** button.

Configure Wireless Bridging

The wireless access point supports a wireless distributing system (WDS) that lets you build large bridged wireless networks. You can select from the following wireless access point modes:

- **Wireless point-to-point bridge**. In this mode, the wireless access point can communicate with another access point that also functions in bridge mode. You can use this mode with or without client association. Whether or not you enable client association, use WEP, WPA-PSK, or WPA2-PSK to secure the communication. For information about how to configure this mode, see *Configure a Point-to-Point Wireless Network* on page 76.
- **Wireless point-to-multipoint bridge**. In this mode, the wireless access point is the master for a group of up to four access points that function in bridge-mode. You can use point-to-multipoint bridge mode with or without client association.

  The other access points in the group need to be set to point-to-point bridge mode, using the MAC address of the master wireless access point. Rather than communicating directly with each other, all other bridge-mode access points send their traffic to the master wireless access point. Whether or not you enable client association, use WEP, WPA-PSK, or WPA2-PSK to secure the communication. For information about how to configure this mode, see *Configure a Point-to-Multipoint Wireless Network* on page 81.

- **Repeating the wireless signal**. In this mode, this wireless access point repeats the wireless signal, does not support communication with wireless clients, and sends all traffic to a remote access point. In this mode, wireless clients cannot associate with the wireless access point. Use WEP, WPA-PSK, or WPA2-PSK to secure the communication with the remote access point. For information about how to configure this mode, see *Configure the Wireless Access Point to Repeat the Wireless Signal Using Point-to-Multipoint Bridge Mode* on page 85.

For you to set up a wireless network in a WDS, the following conditions need to be met for all access points:

- All access points need to use the same SSID, wireless channel, and encryption mode.
- All access points need to be on the same LAN IP subnet. That is, all the access point LAN IP addresses are in the same network.
- All LAN devices (wired and wireless computers) need to be configured to operate in the same LAN network address range as the access points.
- The channel selection on the access points cannot be Auto (see *Configure the Basic Wireless Settings* on page 25).

Configure a Point-to-Point Wireless Network

In point-to-point bridge mode, the wireless access point communicates with another bridge-mode wireless station. Use wireless security to protect this communication. The following figure shows an example in which two wireless access points (APs) function in point-to-point bridge mode with client association:

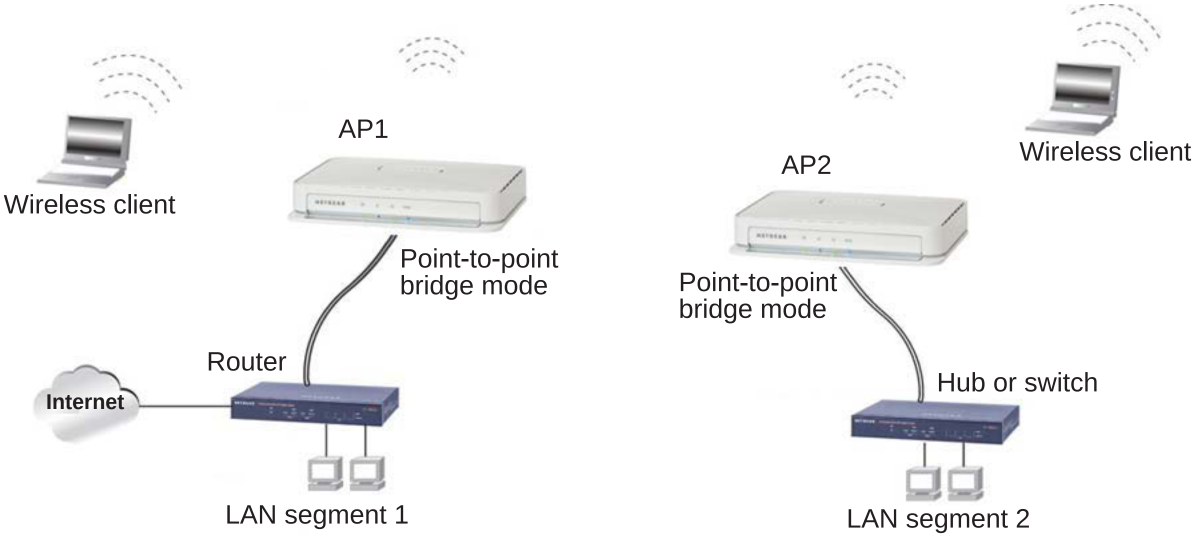


Figure 16. Point-to-point wireless network

➢ **To configure a point-to-point wireless network with or without client association:**

1. Configure the wireless access point (AP1 on LAN Segment 1 in the previous figure) as a point-to-point bridge:

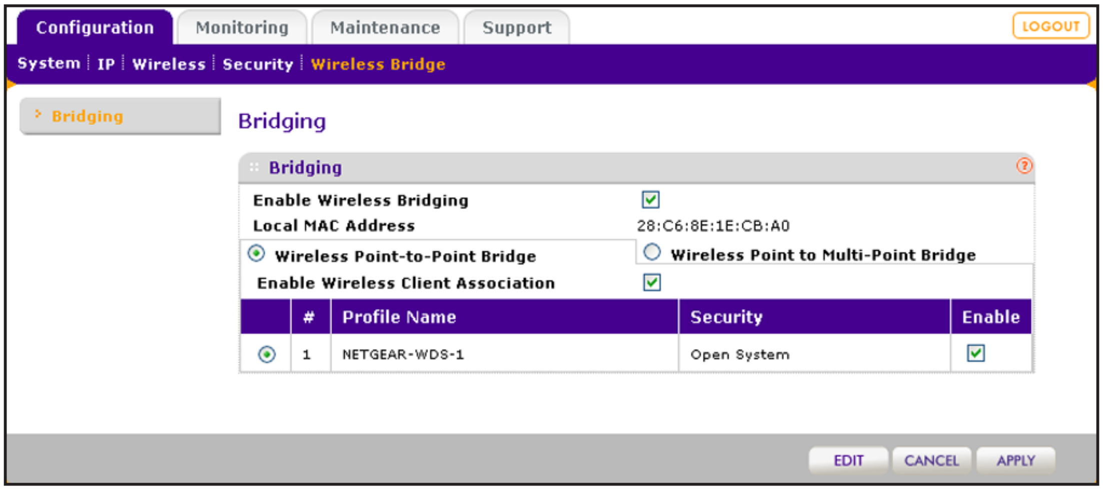
   a. Select **Configuration > Wireless Bridge**.

   The Bridging screen displays (see the following figure).

   b. Select the **Enable Wireless Bridging** check box.

   The Local MAC Address field is a nonconfigurable field that shows the MAC address of the wireless access point.

   c. Select the **Wireless Point-to-Point Bridge** radio button.



Bridging

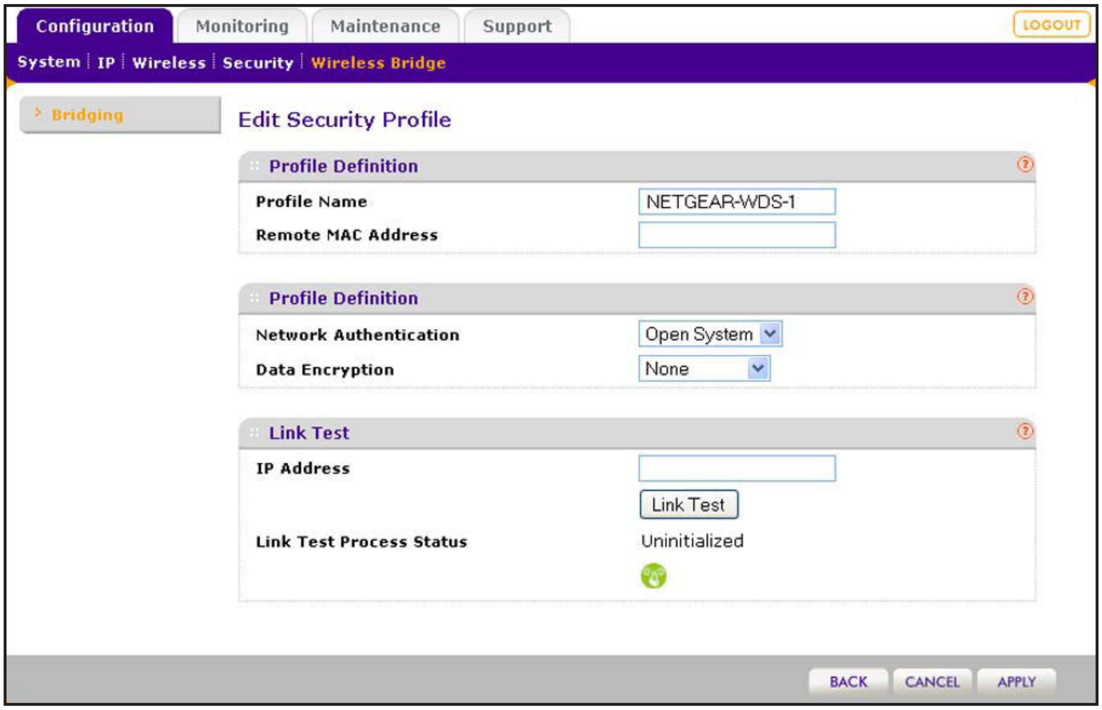
Bridging

Enable Wireless Bridging ☑
Local MAC Address 28:C6:8E:1E:CB:A0
● Wireless Point-to-Point Bridge ○ Wireless Point to Multi-Point Bridge
Enable Wireless Client Association ☑

	#	Profile Name	Security	Enable
●	1	NETGEAR-WDS-1	Open System	☑

   d. Click the **Edit** button to configure the security profile settings.

   The Edit Security Profile screen displays:



Edit Security Profile

Profile Definition

Profile Name: NETGEAR-WDS-1

Remote MAC Address:

Profile Definition

Network Authentication: Open System

Data Encryption: None

Link Test

IP Address:

Link Test Process Status: Uninitialized

e. Specify the settings as described in the following table:

Setting	Description
Profile Definition	
Profile Name	Enter a profile name that is easy to remember. The default name is NETGEAR-WDS-1.
Remote MAC Address	Enter the MAC address of the remote wireless access point (the MAC address of AP2 on LAN Segment 1 in *Figure 16* on page 76).

<table>
<tr><th>Setting</th><th colspan="2">Description</th></tr>
<tr><td colspan="3">**Authentication Settings**</td></tr>
<tr><td rowspan="4">Network Authentication and Data Encryption</td><td colspan="2">From the Network Authentication drop-down menu, select **Open System**, **WPA-PSK**, or **WPA2-PSK**.
Your selection determines the options that the Data Encryption drop-down menu provides, and whether the WPA Passphrase (Network Key) field displays.</td></tr>
<tr><td>Open System</td><td>Although you can use the bridge communication without any authentication and encryption, NETGEAR recommends that you use WEP if you do select an open system. From the Data Encryption drop-down menu, select one of the following:
• **None**. No authentication and encryption.
• **64-bit WEP**. Standard WEP encryption, using 40/64-bit encryption.
• **128-bit WEP**. Standard WEP encryption, using 104/128-bit encryption.
• **152-bit WEP**. Proprietary WEP encryption mode, using 128+24 bit encryption. This mode functions only with other access points that support this mode.
To configure WEP:
1. In the passphrase field, enter a passphrase.
2. Click the **Generate Key** button.
The key is generated and placed in the WEP Key field.</td></tr>
<tr><td>WPA-PSK</td><td>TKIP (Temporal Key Integrity Protocol) is the standard encryption method used with WPA-PSK and the only selection possible from the Data Encryption drop-down menu.
In the WPA Passphrase (Network Key) field, enter a passphrase. The passphrase length needs to be between 8 and 63 characters (inclusive).</td></tr>
<tr><td>WPA2-PSK</td><td>AES (Advanced Encryption Standard) is the standard encryption method used with WPA2-PSK and the only selection possible from the Data Encryption drop-down menu.
In the WPA Passphrase (Network Key) field, enter a passphrase. The passphrase length needs to be between 8 and 63 characters (inclusive).
Note: If you want to use the 11n rates and speed, NETGEAR recommends WPA2-PSK authentication with AES encryption.</td></tr>
<tr><td colspan="3">**Link Test**
The link test lets you validate the bridge configuration by testing whether an IP address behind the remote access point is reachable.</td></tr>
</table>

Setting	Description
IP Address	Enter an IP address that can be reached through the remote access point for which you are setting up a bridge configuration. Click the **Link Test** button.
Link Test Process Status	After one minute or less, the link test returns one of the following results: • **Success**. The link can be established using the bridge configuration, and the IP address behind the remote access point is reachable. You can click the **Apply** button to save the bridge configuration. • **Failure**. The link cannot be established using the bridge configuration. Either the remote access point is not configured correctly or the IP address behind the remote access point is not reachable.

f. Click the **Apply** button.

   The bridge configuration is saved. The Bridging screen displays again.

g. (Optional) Clear the **Enable Wireless Client Association** check box to disable wireless client association while the wireless access point functions as a point-to-point bridge.

   By default, the Enable Wireless Client Association check box is selected and wireless client association is enabled.

h. If the correct profile name and security option are displayed in the table, select the check box in the Enable column.

i. Click the **Apply** button.

   The point-to-point bridge settings are saved.

2. Configure a second wireless access point (AP2) on LAN Segment 2 (see *Figure 16* on page 76) in point-to-point bridge mode.

   AP1 needs to have AP2’s MAC address in its Remote MAC Address field, and AP2 needs to have AP1’s MAC address in its Remote MAC Address field.

3. Verify the following settings for both wireless access points:
   - Both APs are configured to operate in the same LAN network address range as the LAN devices.
   - If you use DHCP, both APs can obtain an IP address automatically (as a DHCP client). For more information, see *Configure the IP Settings* on page 22.
   - Both APs use the same channel, authentication mode, and security settings.

4. Verify connectivity across the LANs.

   A computer on any LAN segment should be able to connect to the Internet or share files and printers with any other computers or servers connected to any of the two LAN segments.

Configure a Point-to-Multipoint Wireless Network

In a point-to-*multi*point bridge, the wireless access point is the master for a group of bridge-mode wireless access points. All traffic is sent to the master rather than to the other wireless access points. Use wireless security to protect this communication.

For each wireless access point that you want the master to be able to connect to, configure a security profile with a unique name and the MAC address of the wireless access point. You can configure up to four such security profiles (NETGEAR-WDS-1, NETGEAR-WDS-2, and so on).

The following figure shows an example in which AP1 functions in point-to-*multi*point bridge mode and AP2 and AP3 function in point-to-point bridge mode:

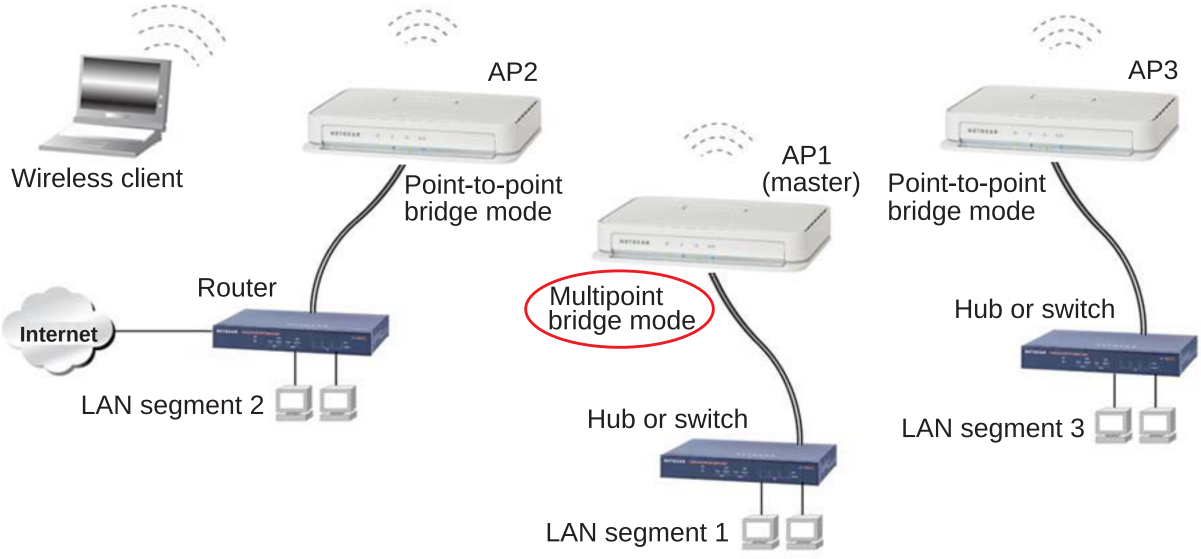


Figure 17. Point-to-multipoint wireless network

➢ **To configure a point-to-multipoint wireless network with or without client association:**

1. Configure the security profiles on the wireless access point (AP1 on LAN Segment 1 in the previous figure):

   a. Select **Configuration > Wireless Bridge**.

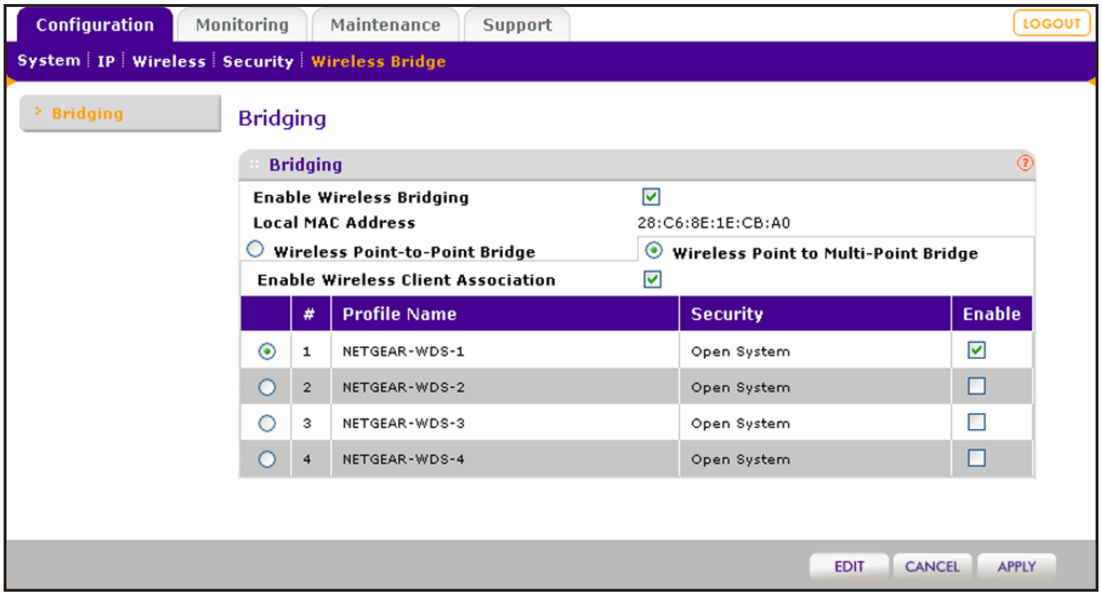
   The Bridging screen displays (see the following figure).

   b. Select the **Enable Wireless Bridging** check box.

   The Local MAC Address field is a nonconfigurable field that shows the MAC address of the wireless access point.

   c. Select the **Wireless Point to Multi-Point Bridge** radio button.

   The screen adjusts. The profile table shows four security profiles.



Bridging

Bridging

Enable Wireless Bridging ☑

Local MAC Address 28:C6:8E:1E:CB:A0

○ Wireless Point-to-Point Bridge ● Wireless Point to Multi-Point Bridge

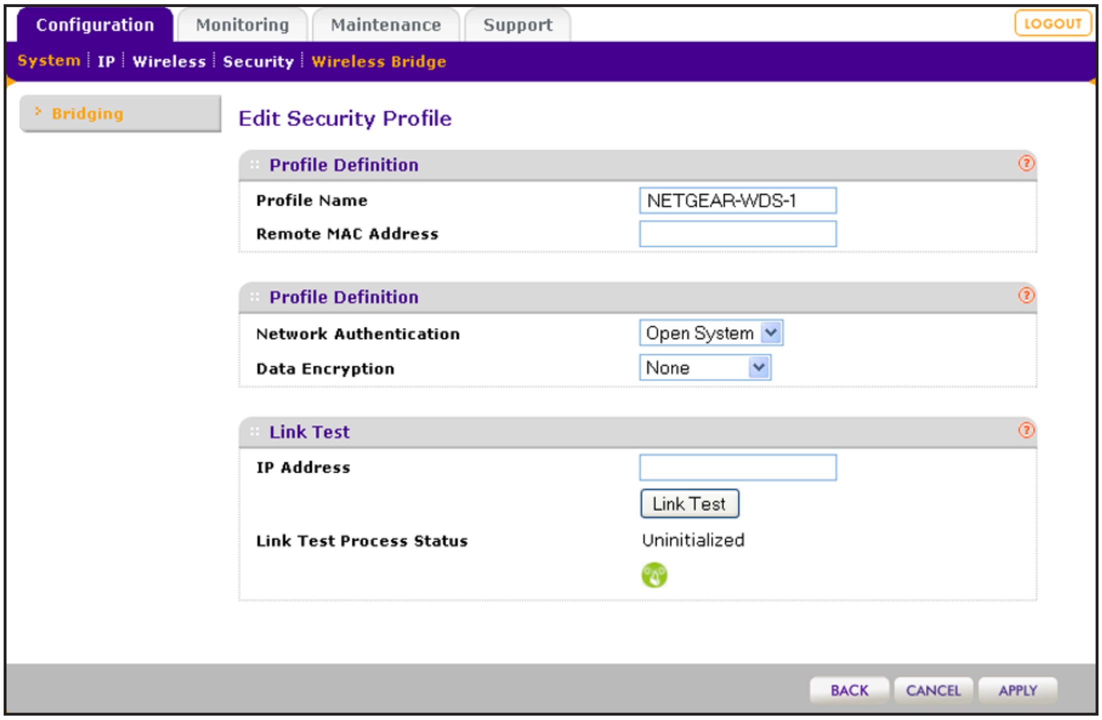
Enable Wireless Client Association ☑

	#	Profile Name	Security	Enable
●	1	NETGEAR-WDS-1	Open System	☑
○	2	NETGEAR-WDS-2	Open System	□
○	3	NETGEAR-WDS-3	Open System	□
○	4	NETGEAR-WDS-4	Open System	□

d. Select a security profile to edit by selecting the corresponding radio button to the left of the profile.

e. Click the **Edit** button to configure the selected security profile settings.

The Edit Security Profile screen displays for the selected security profile.



Edit Security Profile

Profile Definition

Profile Name: NETGEAR-WDS-1

Remote MAC Address:

Profile Definition

Network Authentication: Open System

Data Encryption: None

Link Test

IP Address:

Link Test Process Status: Uninitialized

f. Specify the settings as described in the following table:

Setting	Description	
Profile Definition		
Profile Name	Enter a profile name that is easy to remember. The default names for the four security profiles are NETGEAR-WDS-1, NETGEAR-WDS-2, NETGEAR-WDS-3, and NETGEAR-WDS-4.	
Remote MAC Address	Enter the MAC address of the remote wireless access point (the MAC address of AP2 or AP 3 on LAN Segment 1 in *Figure 17* on page 81).	
Authentication Settings		
Network Authentication and Data Encryption	From the Network Authentication drop-down menu, select **Open System**, **WPA-PSK**, or **WPA2-PSK**. Your selection determines the options that the Data Encryption drop-down menu provides, and whether the WPA Passphrase (Network Key) field displays.	
	Open System	Although you can use the bridge communication without any authentication and encryption, NETGEAR recommends that you use WEP if you do select an open system. From the Data Encryption drop-down menu, select one of the following: • **None**. No authentication and encryption. • **64-bit WEP**. Standard WEP encryption, using 40/64-bit encryption. • **128-bit WEP**. Standard WEP encryption, using 104/128-bit encryption. • **152-bit WEP**. Proprietary WEP encryption mode, using 128+24 bit encryption. This mode functions only with other access points that support this mode. **To configure WEP:** 1. In the passphrase field, enter a passphrase. 2. Click the **Generate Key** button. The key is generated and placed in the WEP Key field.
	WPA-PSK	TKIP (Temporal Key Integrity Protocol) is the standard encryption method used with WPA-PSK and the only selection possible from the Data Encryption drop-down menu. In the WPA Passphrase (Network Key) field, enter a passphrase. The passphrase length needs to be between 8 and 63 characters (inclusive).

Setting	Description	
Network Authentication and Data Encryption (continued)	WPA2-PSK	AES (Advanced Encryption Standard) is the standard encryption method used with WPA2-PSK and the only selection possible from the Data Encryption drop-down menu. In the WPA Passphrase (Network Key) field, enter a passphrase. The passphrase length needs to be between 8 and 63 characters (inclusive). **Note:** If you want to use the 11n rates and speed, NETGEAR recommends WPA2-PSK authentication with AES encryption.
Link Test The link test lets you validate the bridge configuration by testing whether an IP address behind the remote access point is reachable.		
IP Address	Enter an IP address that can be reached through the remote access point for which you are setting up a bridge configuration. Click the **Link Test** button.	
Link Test Process Status	After one minute or less, the link test returns one of the following results: • **Success**. The link can be established using the bridge configuration, and the IP address behind the remote access point is reachable. You can click the **Apply** button to save the bridge configuration. • **Failure**. The link cannot be established using the bridge configuration. Either the remote access point is not configured correctly or the IP address behind the remote access point is not reachable.	

g. Click the **Apply** button.

   The bridge configuration is saved. The Bridging screen displays again.

h. Repeat *Step d* through *Step g* for any other security profile that you want to edit.

   For example, first configure security profile NETGEAR-WDS-1 with the MAC address of AP2, and then configure security profile NETGEAR-WDS-2 with the MAC address of AP3 (see *Figure 17* on page 81).

2. Activate the wireless access point (AP1 on LAN Segment 1 in *Figure 17* on page 81) as a point-to-multipoint bridge (that is, as the master in the wireless network):

a. On the Bridging screen, select the **Enable Wireless Bridging** check box.

b. Select the **Wireless Point to Multi-Point Bridge** radio button.

   By default, the Enable Wireless Client Association is selected. Keep the check box selected to enable wireless client association.

Note: If you clear the Enable Wireless Client Association check box, the wireless access point does not function in point-to-multipoint bridge but in repeater mode.

c. If the correct profile names and security options are displayed in the table, select the check boxes in the Enable column for all security profiles that you want to enable.

d. On the Bridging screen, click the **Apply** button.

   The point-to-multipoint bridge settings are activated.

3. Configure AP2 on LAN Segment 2 (see *Figure 17* on page 81) in point-to-point bridge mode with the remote MAC address of AP1.
4. Configure AP3 on LAN Segment 3 (see *Figure 17* on page 81) in point-to-point bridge mode with the remote MAC address of AP1.
5. Verify the following:
   - Only AP1 on LAN Segment 1 is configured in point-to-multipoint bridge mode, and all others wireless access points are configured in point-to-point bridge mode.
   - AP2 and AP3 (the point-to-point APs) have AP1’s MAC address in their Remote MAC Address field.
   - All APs are configured to operate in the same LAN network address range as the LAN devices.
   - If you use DHCP, all APs can obtain an IP address automatically (as DHCP clients). For more information, see *Configure the IP Settings* on page 22.
   - All APs use the same channel, authentication mode, and security settings.
6. Verify connectivity across the LANs.

   A computer on any LAN segment should be able to connect to the Internet or share files and printers with any other computers or servers connected to any of the three LAN segments.

Note: You can extend this multipoint bridging configuration by adding more wireless access points that are configured in point-to-point mode for each additional LAN segment.

Configure the Wireless Access Point to Repeat the Wireless Signal Using Point-to-Multipoint Bridge Mode

You can configure the wireless access point to repeat the wireless signal, without communication with other wireless clients. All traffic is sent to the remote or downstream wireless access point. You can configure up to four security profiles to enable the wireless access point to repeat the wireless signal for four remote wireless access points. Each security profile requires a unique name and needs to include the MAC address of the remote wireless access point. You can configure up to four such security profiles (NETGEAR-WDS-1, NETGEAR-WDS-2, and so on).

The following figure shows an example in which AP1, AP2, and AP3 repeat the wireless signal in point-to-*multi*point bridge mode. AP2 requires a security profile for AP1 and another one for AP3:

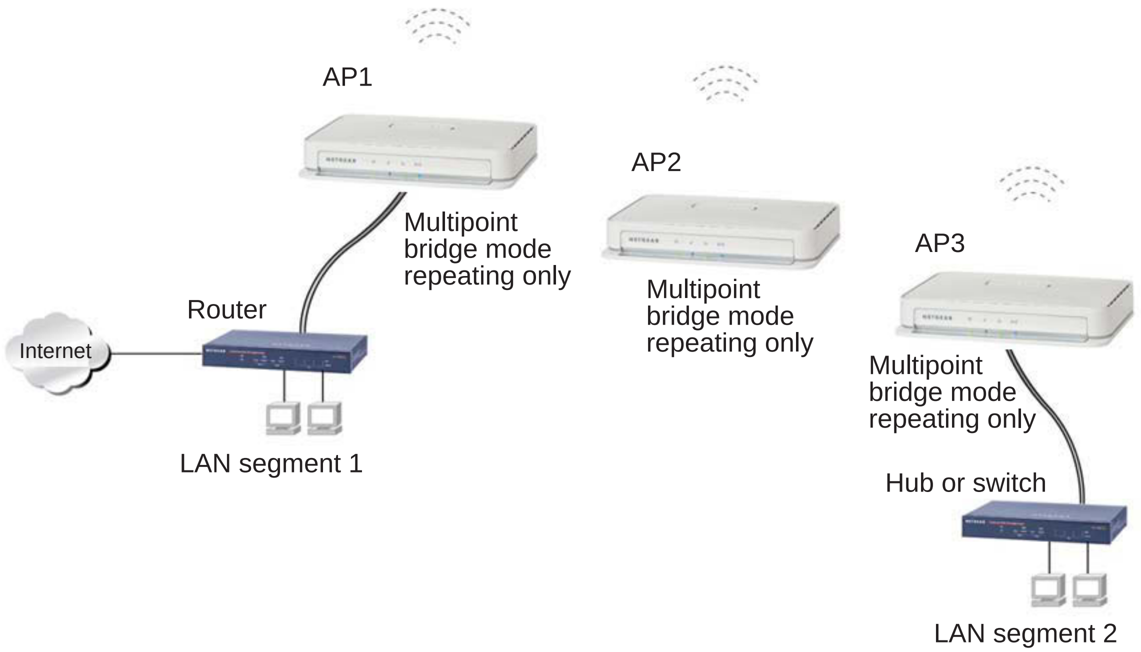

AP1
Multipoint bridge mode repeating only
AP2
Multipoint bridge mode repeating only
AP3
Multipoint bridge mode repeating only
Router
Internet
LAN segment 1
Hub or switch
LAN segment 2

Figure 18. Repeating the wireless signal in point-to-multipoint bridge mode

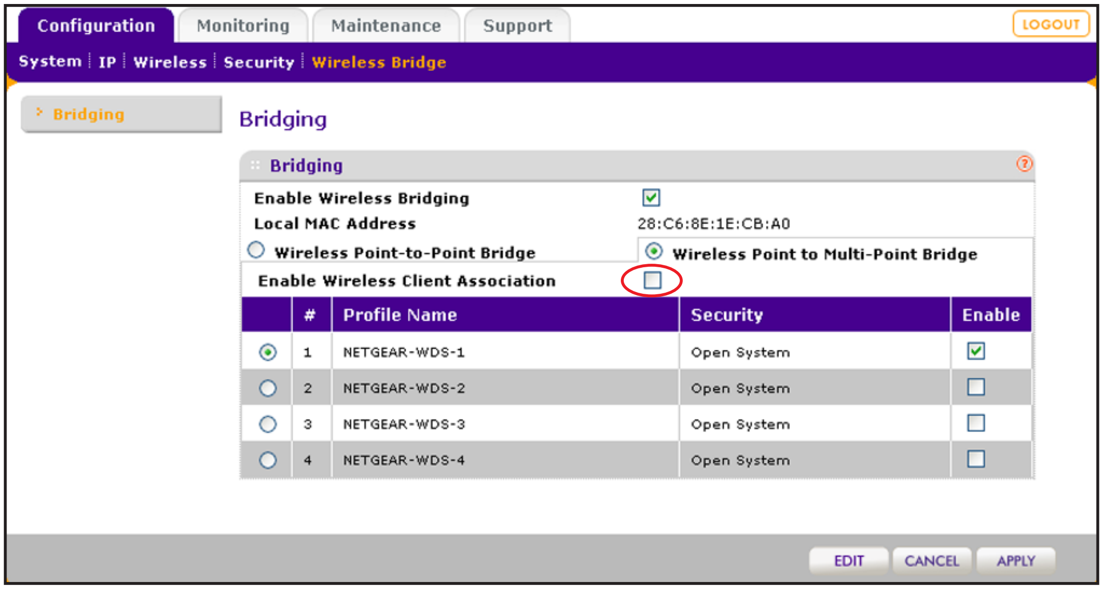
➢ **To configure the wireless access point to repeat the wireless signal:**

1. Configure the security profiles on the wireless access point (AP2 on LAN Segment 2 in the previous figure):
   - a. Select **Configuration > Wireless Bridge**.

     The Bridging screen displays (see the following figure).
   - b. Select the **Enable Wireless Bridging** check box.

     The Local MAC Address field is a nonconfigurable field that shows the MAC address of the wireless access point.
   - c. Select the **Wireless Point to Multi-Point Bridge** radio button.

     The screen adjusts. The profile table shows four security profiles.



Bridging

Bridging

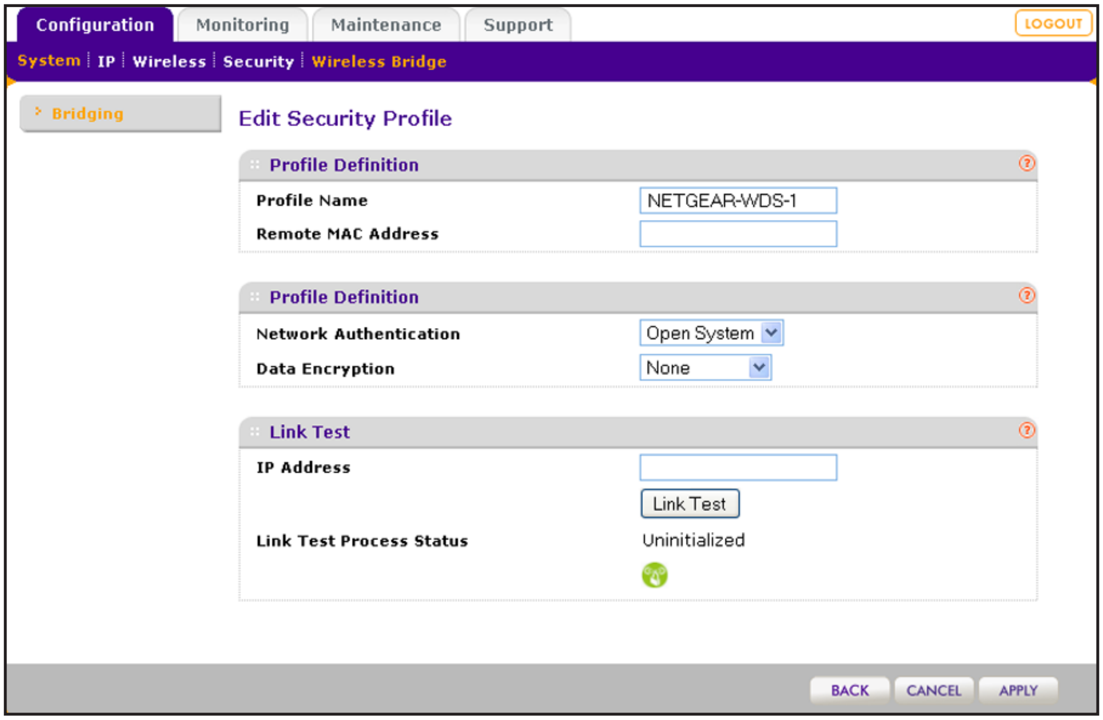
Enable Wireless Bridging	☑
Local MAC Address	28:C6:8E:1E:CB:A0
○ Wireless Point-to-Point Bridge	● Wireless Point to Multi-Point Bridge
Enable Wireless Client Association	□

	#	Profile Name	Security	Enable
●	1	NETGEAR-WDS-1	Open System	☑
○	2	NETGEAR-WDS-2	Open System	□
○	3	NETGEAR-WDS-3	Open System	□
○	4	NETGEAR-WDS-4	Open System	□

d. Select a security profile to edit by selecting the corresponding radio button to the left of the profile.

e. Click the **Edit** button to configure the selected security profile settings.

The Edit Security Profile screen displays for the selected security profile.



Edit Security Profile

Profile Definition

Profile Name	NETGEAR-WDS-1
Remote MAC Address	

Profile Definition

Network Authentication	Open System
Data Encryption	None

Link Test

IP Address	
Link Test Process Status	Uninitialized

f. Specify the settings as described in the following table:

<table>
<tr><th>Setting</th><th colspan="2">Description</th></tr>
<tr><td colspan="3"><b>Profile Definition</b></td></tr>
<tr><td>Profile Name</td><td colspan="2">Enter a profile name that is easy to remember. The default names for the four security profiles are NETGEAR-WDS-1, NETGEAR-WDS-2, NETGEAR-WDS-3, and NETGEAR-WDS-4.</td></tr>
<tr><td>Remote MAC Address</td><td colspan="2">Enter the MAC address of the remote wireless access point (the MAC address of AP1 or AP3 in <i>Figure 18</i> on page 86).</td></tr>
<tr><td colspan="3"><b>Authentication Settings</b></td></tr>
<tr><td rowspan="3">Network Authentication and Data Encryption</td><td colspan="2">From the Network Authentication drop-down menu, select <b>Open System</b>, <b>WPA-PSK</b>, or <b>WPA2-PSK</b>.
Your selection determines the options that the Data Encryption drop-down menu provides, and whether the WPA Passphrase (Network Key) field displays.</td></tr>
<tr><td>Open System</td><td>Although you can use the bridge communication without any authentication and encryption, NETGEAR recommends that you use WEP if you do select an open system. From the Data Encryption drop-down menu, select one of the following:
• <b>None</b>. No authentication and encryption.
• <b>64-bit WEP</b>. Standard WEP encryption, using 40/64-bit encryption.
• <b>128-bit WEP</b>. Standard WEP encryption, using 104/128-bit encryption.
• <b>152-bit WEP</b>. Proprietary WEP encryption mode, using 128+24 bit encryption. This mode functions only with other access points that support this mode.
<b>To configure WEP:</b>
1. In the passphrase field, enter a passphrase.
2. Click the <b>Generate Key</b> button.
The key is generated and placed in the WEP Key field.</td></tr>
<tr><td>WPA-PSK</td><td>TKIP (Temporal Key Integrity Protocol) is the standard encryption method used with WPA-PSK and the only selection possible from the Data Encryption drop-down menu.
In the WPA Passphrase (Network Key) field, enter a passphrase. The passphrase length needs to be between 8 and 63 characters (inclusive).</td></tr>
</table>

Setting	Description	
Network Authentication and Data Encryption (continued)	WPA2-PSK	AES (Advanced Encryption Standard) is the standard encryption method used with WPA2-PSK and the only selection possible from the Data Encryption drop-down menu. In the WPA Passphrase (Network Key) field, enter a passphrase. The passphrase length needs to be between 8 and 63 characters (inclusive). **Note:** If you want to use the 11n rates and speed, NETGEAR recommends WPA2-PSK authentication with AES encryption.
Link Test The link test lets you validate the bridge configuration by testing whether an IP address behind the remote access point is reachable.		
IP Address	Enter an IP address that can be reached through the remote access point for which you are setting up a bridge configuration. Click the **Link Test** button.	
Link Test Process Status	After one minute or less, the link test returns one of the following results: • **Success**. The link can be established using the bridge configuration, and the IP address behind the remote access point is reachable. You can click the **Apply** button to save the bridge configuration. • **Failure**. The link cannot be established using the bridge configuration. Either the remote access point is not configured correctly or the IP address behind the remote access point is not reachable.	

g. Click the **Apply** button.

The bridge configuration is saved. The Bridging screen displays again.

h. Repeat *Step d* through *Step g* for any other security profile that you want to edit.

For example, first configure security profile NETGEAR-WDS-1 with the MAC address of AP1, and then configure security profile NETGEAR-WDS-2 with the MAC address of AP3 (see *Figure 18* on page 86).

2. Activate repeater mode on the wireless access point (AP2 in *Figure 18* on page 86):

a. On the Bridging screen, select the **Enable Wireless Bridging** check box.

b. Select the **Wireless Point-to-Multi-Point Bridge** radio button.

c. Clear the **Enable Wireless Client Association** check box.

Wireless client association is disabled. No wireless clients can associate with the wireless access point.

Note: If you do not clear the Enable Wireless Client Association check box, the wireless access point functions in regular point-to-*multi*point bridge mode.

d. If the correct profile names and security options are displayed in the table, select the check boxes in the Enable column for all security profiles that you want to enable.

e. On the Bridging screen, click the **Apply** button.

The repeater settings are activated.

3. Configure AP1 on LAN Segment 1 (see *Figure 18* on page 86) in repeater mode with the remote MAC address of AP2.
4. Configure AP3 on LAN Segment 3 (see *Figure 18* on page 86) in repeater mode with the remote MAC address of AP2.
5. Verify the following:
   - AP1 has AP2's MAC address in its Remote MAC Address field.
   - AP3 has AP2's MAC address in its Remote MAC Address field.
   - All APs are configured to operate in the same LAN network address range as the LAN devices.
   - If you use DHCP, all APs can obtain an IP address automatically (as DHCP clients). For more information, see *Configure the IP Settings* on page 22.
   - All APs use the same channel, authentication mode, and security settings.
6. Verify connectivity across the LANs.

   A computer on any LAN segment should be able to connect to the Internet or share files and printers with any other computers or servers connected to any of the two LAN segments.

Note: Between each LAN segment, you can extend repetition of the wireless signal by adding up to two more wireless access points that are configured in point-to-*multi*point bridge mode without client association.

6. Monitoring

6

This chapter describes how to monitor the wireless access point and its network traffic. The chapter includes the following sections:

- *View System Information*
- *Monitor Wireless Clients*
- *View the Activity Log*
- *Traffic Statistics*

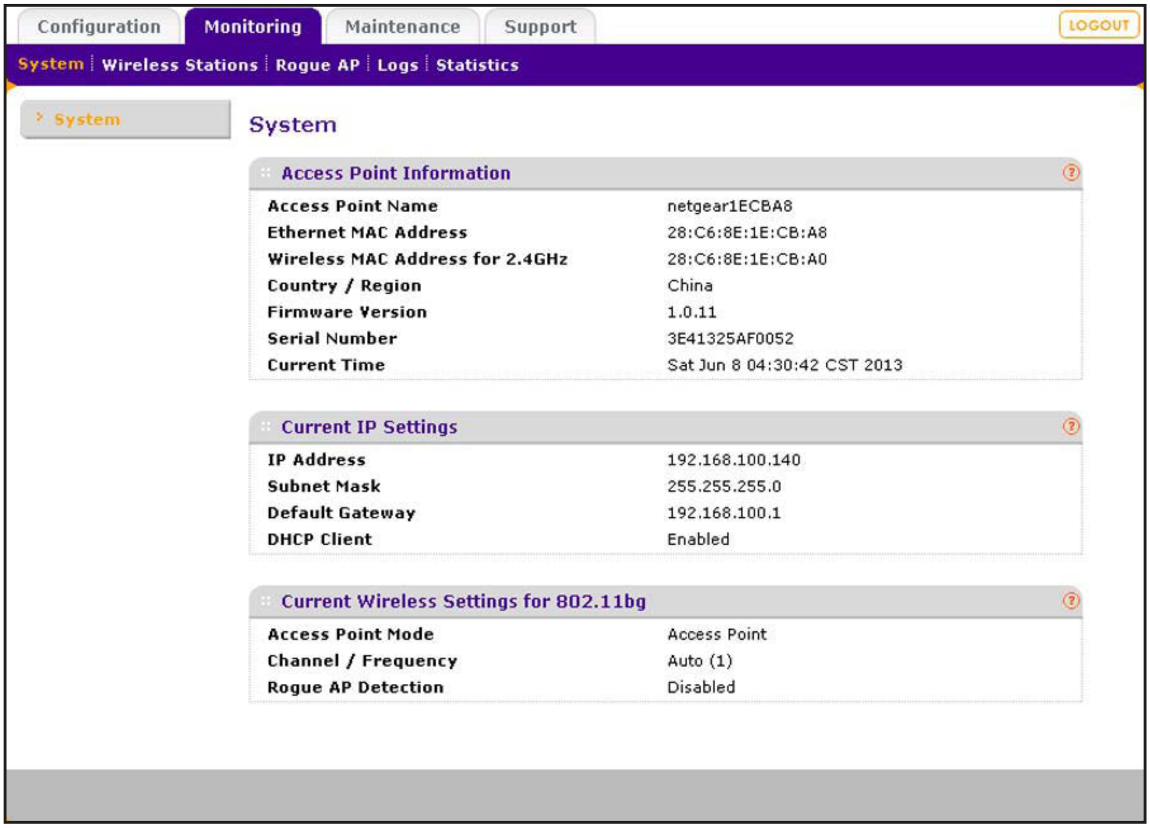
Note: For information about monitoring rogue and known access points, see *View and Save Access Point Lists* on page 64.

View System Information

The System screen provides a summary of the current wireless access point configuration settings, including current IP settings and current wireless settings. This information is read only, so any changes need to be made on other screens.

➢ **To view the System screen:**

Select **Monitoring > System**.



System

Access Point Information

Access Point Name	netgear1ECBA8
Ethernet MAC Address	28:C6:8E:1E:CB:A8
Wireless MAC Address for 2.4GHz	28:C6:8E:1E:CB:A0
Country / Region	China
Firmware Version	1.0.11
Serial Number	3E41325AF0052
Current Time	Sat Jun 8 04:30:42 CST 2013

Current IP Settings

IP Address	192.168.100.140
Subnet Mask	255.255.255.0
Default Gateway	192.168.100.1
DHCP Client	Enabled

Current Wireless Settings for 802.11bg

Access Point Mode	Access Point
Channel / Frequency	Auto (1)
Rogue AP Detection	Disabled

The following table explains the fields of the System screen:

Setting	Description
Access Point Information	
Access Point Name	The NetBIOS name. For information about how to change the default name, see *Configure Basic General System Settings and Time Settings* on page 20.
Ethernet MAC Address	The MAC address of the wireless access point’s Ethernet port.
Wireless MAC Address for 2.4GHz	The MAC address of the wireless access point’s 2.4 GHz radio.

Setting	Description
Country / Region	The country or region for which the wireless access point is licensed for use. For information about how to change the country or region, see *Configure Basic General System Settings and Time Settings* on page 20. **Note:** It might not be legal to operate this wireless access point in a country or region other than one of those identified in this field.
Firmware Version	The version of the firmware that is installed.
Serial Number	The serial number of the wireless access point.
Current Time	The current time. For information about how to change the time settings, see *Configure Basic General System Settings and Time Settings* on page 20.
Current IP Settings For information about how to change any of these IP settings, see *Configure the IP Settings* on page 22.	
IP Address	The IP address of the wireless access point.
Subnet Mask	The subnet mask for the address of the wireless access point.
Default Gateway	The default IP gateway for the wireless access point communication.
DHCP Client	Enabled indicates that the current IP address was obtained from a DHCP server on your LAN network. Disabled indicates a static IP configuration.
Current Wireless Settings for 802.11b, **802.11g**, or **802.11ng** **Note:** The section heading depends on the configured wireless mode.	
Access Point Mode	The operating mode of the wireless access point. One of the following modes is indicated: • Access Point • Point-to-Point Bridge • Point-to-Point Bridge with Access Point • Multi-Point Bridge with/without client association For information about how to change the mode, see *Configure Wireless Bridging* on page 75.
Channel / Frequency	The channel that the wireless port is using. For information about how to change the channel and frequency, see *Configure 802.11b/bg/ng Wireless Settings* on page 25.
Rogue AP Detection	Enabled indicates that rogue AP detection is enabled. Disabled indicates that it is not.

Monitor Wireless Clients

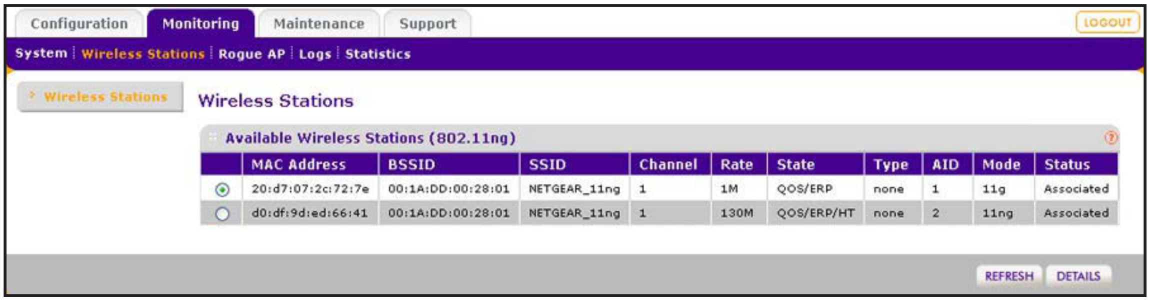
The Wireless Stations screen contains the Available Wireless Stations table. This table shows all IP devices that are associated with the wireless access point in the wireless network that is defined by the wireless network name (SSID). The table headings indicate the wireless modes (802.11b, 802.11bg, or 802.11ng).

Note: A wireless network can include multiple wireless access points, all using the same network name (SSID). This uniformity extends the reach of the wireless network and allows users to roam from one wireless access point to another, providing seamless network connectivity. Under these circumstances, be aware that the Available Wireless Stations table includes only the stations associated with this wireless access point.

➢ **To view the attached wireless clients, and to view details for a wireless client:**

1. Select **Monitoring > Wireless Stations**.

   The Wireless Stations screen displays:



Wireless Stations

Available Wireless Stations (802.11ng)

	MAC Address	BSSID	SSID	Channel	Rate	State	Type	AID	Mode	Status
●	20:d7:07:2c:72:7e	00:1A:DD:00:28:01	NETGEAR_11ng	1	1M	QOS/ERP	none	1	11g	Associated
○	d0:df:9d:ed:66:41	00:1A:DD:00:28:01	NETGEAR_11ng	1	130M	QOS/ERP/HT	none	2	11ng	Associated

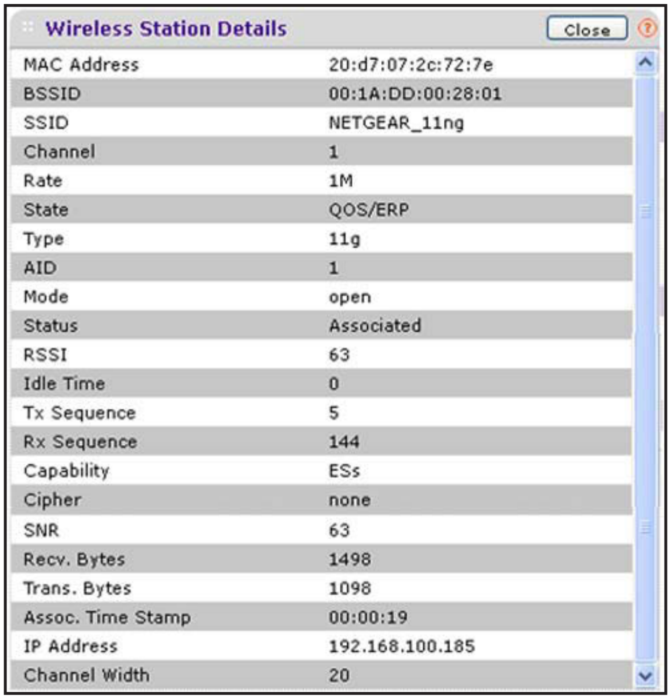
2. (Optional) Click the **Refresh** button to update the list.

   If the wireless access point is rebooted, the wireless client data is lost until the wireless access point rediscovers the devices. When you click the Refresh button, the wireless access point attempt to detect associated devices.

   The Available Wireless Stations table shows the MAC address, BSSID, SSID, channel, rate, state, type, AID, mode, and status for each device. For information about these and more fields, see the table that follows the next figure.

3. To view details for a wireless client, select the corresponding radio button, and click the **Details** button.

   The Wireless Stations Details screen displays:



MAC Address	20:d7:07:2c:72:7e
BSSID	00:1A:DD:00:28:01
SSID	NETGEAR_11ng
Channel	1
Rate	1M
State	QOS/ERP
Type	11g
AID	1
Mode	open
Status	Associated
RSSI	63
Idle Time	0
Tx Sequence	5
Rx Sequence	144
Capability	ESs
Cipher	none
SNR	63
Recv. Bytes	1498
Trans. Bytes	1098
Assoc. Time Stamp	00:00:19
IP Address	192.168.100.185
Channel Width	20

The following table explains the fields of the Wireless Stations Details screen:

Setting	Description
MAC Address	The MAC address of the wireless client.
BSSID	The BSSID that the wireless client is using.
SSID	The SSID that the wireless client is using.
Channel	The channel that the wireless client is using.
Rate	The transmit data rate in Mbps of the wireless client.
State	The features that are enabled on the wireless client.
Type	The authentication and encryption type that the wireless client is using.
AID	The associated identifier (AID) of the wireless client.
Mode	The wireless mode in which the wireless client is operating.
Status	The wireless status of the wireless client (Associated).
RSSI	The received signal strength indicator (RSSI) of the wireless client.
Idle Time	The time since the last frame was received from the wireless client.
Tx Sequence	The sequence number of the last frame that was transmitted to the wireless client.
Rx Sequence	The sequence number of the last frame that was received from the wireless client.
Capability	The summary of the capability of the wireless client that was detected during association.

Setting	Description
Cipher	The cipher that the wireless client is using and that defines the type of encryption.
SNR	The signal-to-noise ratio (SNR) that indicates how much the signal of the wireless client has been corrupted by noise.
Recv. Bytes	The number of bytes received on the wireless client since it last started.
Trans. bytes	The number of bytes transmitted by the wireless client since it last started.
Assoc. Time Stamp	The time when these details of the wireless client were retrieved.
IP Address	The IP address of the wireless client.
Channel Width	The channel width at which the wireless client operates.

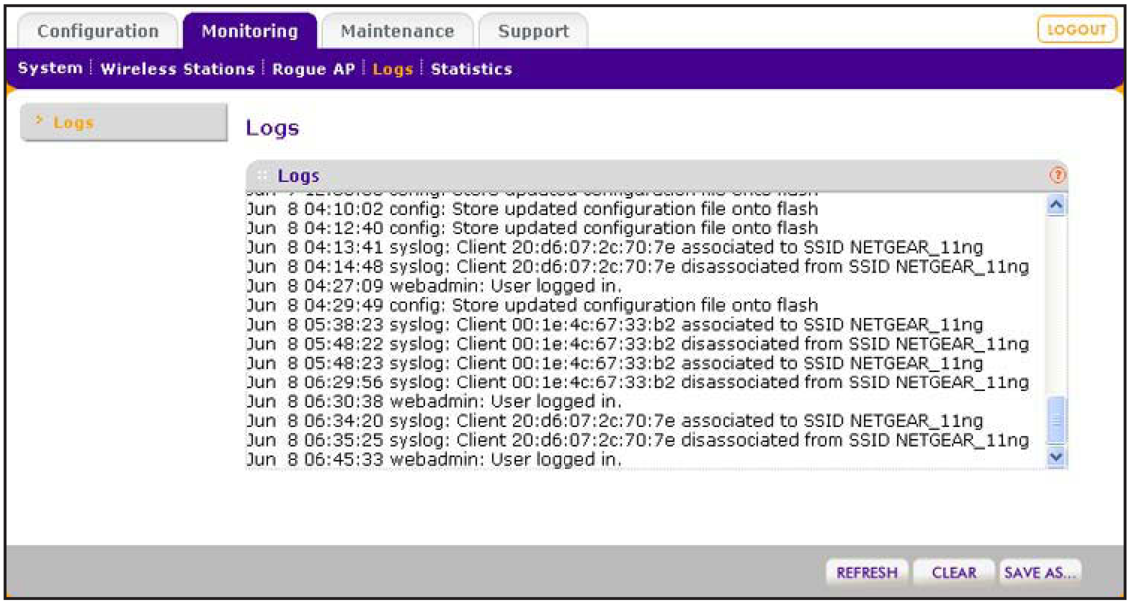
View the Activity Log

You can view the wireless access point’s activity logs onscreen and save the logs.

➢ **To display the activity log and save it:**

1. Select **Monitoring > Logs**.

   The Logs screen displays:



```
Jun  8 04:10:02 config: Store updated configuration file onto flash
Jun  8 04:12:40 config: Store updated configuration file onto flash
Jun  8 04:13:41 syslog: Client 20:d6:07:2c:70:7e associated to SSID NETGEAR_11ng
Jun  8 04:14:48 syslog: Client 20:d6:07:2c:70:7e disassociated from SSID NETGEAR_11ng
Jun  8 04:27:09 webadmin: User logged in.
Jun  8 04:29:49 config: Store updated configuration file onto flash
Jun  8 05:38:23 syslog: Client 00:1e:4c:67:33:b2 associated to SSID NETGEAR_11ng
Jun  8 05:48:22 syslog: Client 00:1e:4c:67:33:b2 disassociated from SSID NETGEAR_11ng
Jun  8 05:48:23 syslog: Client 00:1e:4c:67:33:b2 associated to SSID NETGEAR_11ng
Jun  8 06:29:56 syslog: Client 00:1e:4c:67:33:b2 disassociated from SSID NETGEAR_11ng
Jun  8 06:30:38 webadmin: User logged in.
Jun  8 06:34:20 syslog: Client 20:d6:07:2c:70:7e associated to SSID NETGEAR_11ng
Jun  8 06:35:25 syslog: Client 20:d6:07:2c:70:7e disassociated from SSID NETGEAR_11ng
Jun  8 06:45:33 webadmin: User logged in.
```

2. (Optional) Click the **Refresh** button.

   The information onscreen is updated.

3. (Optional) Click the **Save As** button.
4. Navigate to the desired location, and save the log contents.

   Note: *The nature of this step depends on the browser that you are using.*

5. (Optional) Click the **Clear** button.

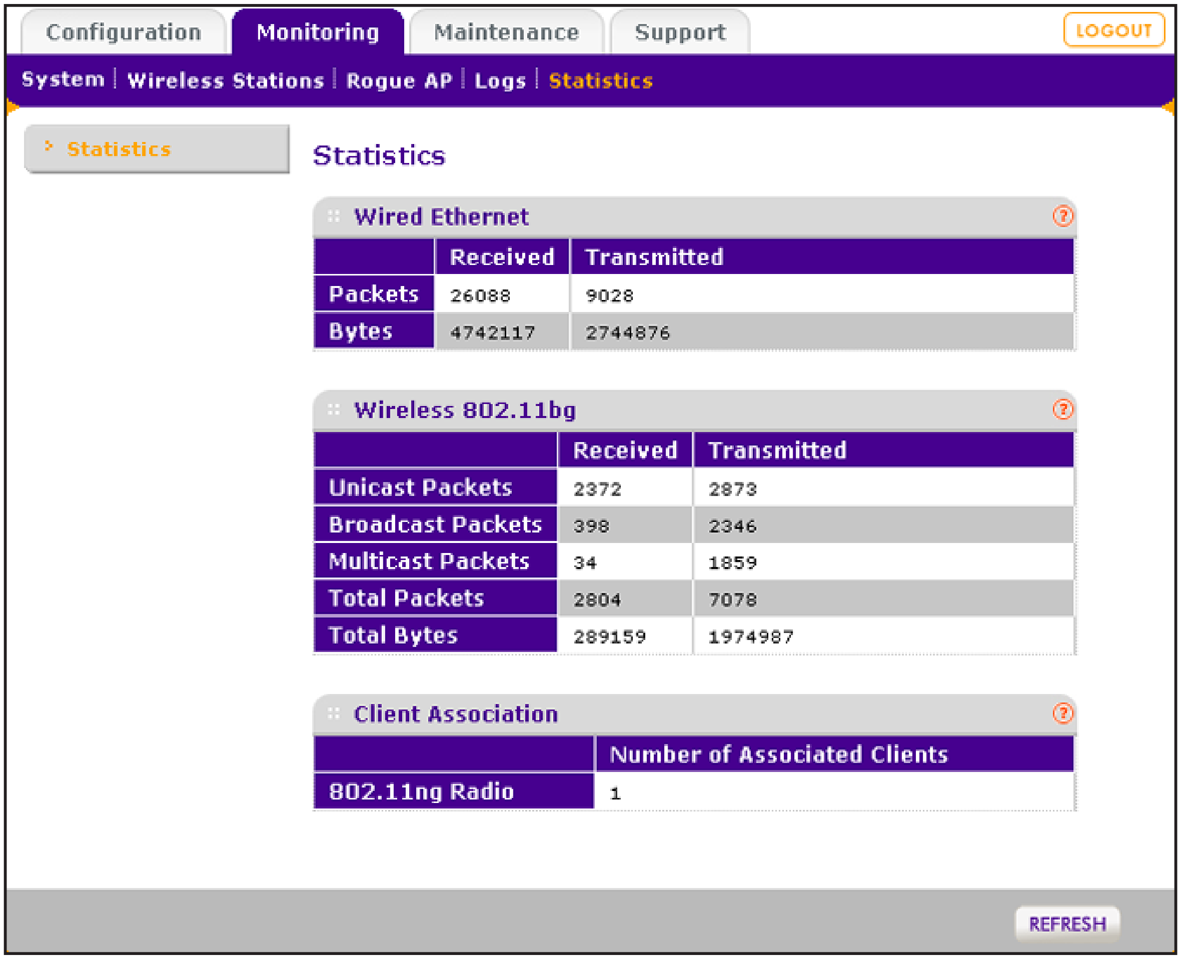
   The log contents are cleared.

Traffic Statistics

The Statistics screen displays information for both wired (LAN) and wireless (WLAN) network traffic.

➢ **To display the Statistics screen:**

Select **Monitoring > Statistics**.



Statistics

Wired Ethernet

	Received	Transmitted
Packets	26088	9028
Bytes	4742117	2744876

Wireless 802.11bg

	Received	Transmitted
Unicast Packets	2372	2873
Broadcast Packets	398	2346
Multicast Packets	34	1859
Total Packets	2804	7078
Total Bytes	289159	1974987

Client Association

	Number of Associated Clients
802.11ng Radio	1

To update the statistics information, click the **Refresh** button.

The following table explains the fields of the Statistics screen:

Setting	Description
Wired Ethernet	
Packets	The number of packets received and transmitted over the Ethernet connection since the wireless access point was restarted.
Bytes	The number of bytes received and transmitted over the Ethernet connection since the wireless access point was restarted.
Wireless 802.11b, **Wireless 802.11bg**, or **Wireless 801.11ng** **Note:** The section heading depends on the configured wireless mode.	
Unicast Packets	The number of unicast packets received and transmitted over the wireless connection since the wireless access point was restarted.
Broadcast Packets	The number of broadcast packets received and transmitted over the wireless connection since the wireless access point was restarted.
Multicast Packets	The number of multicast packets received and transmitted over the wireless connection since the wireless access point was restarted.
Total Packets	The total number of packets received and transmitted over the wireless connection since the wireless access point was restarted.
Total Bytes	The total number of bytes received and transmitted over the wireless connection since the wireless access point was restarted.
Client Association	
802.11b Radio, 802.11bg Radio, or 802.11ng Radio	The number of associated clients that are connected to the radio in the configured wireless modes.

Troubleshooting

7

This chapter provides information about troubleshooting the wireless access point. After each problem description, instructions are given to help you diagnose and solve the problem. For the common problems listed, go to the section indicated.

- Is the wireless access point on?

  See *Basic Functioning* on page 100.

- Did I connect the wireless access point correctly?

  See *Basic Functioning* on page 100.

- I cannot access the Internet or the LAN.

  See *You Cannot Access the Internet or the LAN from a Wireless-Capable Computer* on page 101.

- I cannot access the wireless access point from a browser.

  See *You Cannot Configure the Wireless Access Point from a Browser* on page 102.

- A time-out occurs.

  See *When You Enter a URL or IP Address a Time-Out Error Occurs* on page 103.

- I have problems with the LAN connection.

  See *Troubleshoot a TCP/IP Network Using the Ping Utility* on page 103.

- The date or time is not correct.

  See *Problems with Date and Time* on page 105.

You can find the following troubleshooting information in *Chapter 4, Management*:

- I cannot remember the wireless access point’s configuration password.

  See *Change the Administrator Password* on page 61.

- I want to clear the configuration and start over again.

  See *Restore the Wireless Access Point to the Factory Default Settings* on page 58.

Basic Functioning

This section describes how you can use the LEDs to troubleshoot the wireless access point.

- *Verify the Correct Sequence of Events at Startup*
- *No LEDs Are Lit on the Wireless Access Point*
- *LAN LED Is Not Lit*
- *WLAN LED Is Not Lit*

Note: For descriptions of the LEDs, see *Front Panel* on page 11.

Verify the Correct Sequence of Events at Startup

➢ **After you turn on power to the wireless access point, check that the following sequence of events occurs:**

- The Power LED is green. If the Power LED is off, check the connections, and check if the power outlet is controlled by a wall switch that is turned off.
- The Test LED is amber. After about one minute, the Test LED turns off.
- The LAN LED indicates the LAN speed for the LAN port: green for 1000 Mbps or amber for 100 Mbps or 10 Mbps.
- The WLAN LED is blue when the wireless LAN (WLAN) is ready.

If any of these conditions does not occur, see the appropriate following section.

No LEDs Are Lit on the Wireless Access Point

It takes a few seconds for the Power LED to light. Wait 15 seconds and check the Power LED status on the wireless access point.

➢ **If the wireless access point has no power and you use a PoE switch to provide power to the wireless access point:**

- Make sure that the Ethernet cable between the wireless access point and the PoE switch is connected correctly at both ends.
- Make sure that the power cord of the PoE switch is plugged into a working power outlet or power strip.
- Make sure that the PoE switch is functioning normally.

- **If the wireless access point has no power and you use a power cord to provide power to the wireless access point:**
  - Make sure that the power cord is connected to the wireless access point.
  - Make sure that the power adapter is connected to a functioning power outlet. If it is in a power strip, make sure that the power strip is turned on. If it is plugged directly into the wall, verify that it is not a switched outlet.
  - Make sure that you are using the correct NETGEAR power adapter that is supplied with your wireless access point.

LAN LED Is Not Lit

There is a hardware connection problem.

- **Check these items:**
  - Make sure that the cable connectors are securely plugged in at the wireless access point and the network device—hub, (PoE) switches, or router.
  - Make sure that the connected device is turned on.
  - Make sure that the correct cable is used. Use a standard straight-through Category 5 Ethernet cable such as the one that came with the wireless access point. If the network device has Auto Uplink (MDI/MDIX) ports, you can use either a crossover cable or a normal straight-through cable.

WLAN LED Is Not Lit

The wireless access point's antenna is not working. If the WLAN LED remains off, either disconnect the cables to the PoE switches and then reconnect them again, or disconnect the adapter from its power source and then plug it in again.

Contact NETGEAR technical support if the WLAN LED remains off.

You Cannot Access the Internet or the LAN from a Wireless-Capable Computer

There is a configuration problem.

- **Check these items:**
  - You might not have restarted the computer with the wireless adapter to allow TCP/IP changes to take effect. Restart the computer.
  - The computer with the wireless adapter might not have the correct TCP/IP settings to communicate with the network. Restart the computer and check that TCP/IP is set up correctly for that network. In Windows, the usual setting for Network Properties is to obtain an IP address automatically.

- The wireless access point’s default values might not work with your network. Check the wireless access point’s default configuration against the configuration of other devices in your network.
- Make sure that the SSID, network authentication, and data encryption settings of the computer with the wireless adapter are the same as those of the wireless access point.
- Ping the IP address of the wireless access point to verify that a wireless connection exists between the computer with the wireless adapter and the wireless access point. If the ping fails, check the network configuration for the wireless access point (see *Configure the IP Settings* on page 22).
- Ping the default gateway to verify that a path exists from the computer with the wireless adapter to the default gateway. If the ping fails, check the network configuration or call the Internet service provider (ISP).

You Cannot Configure the Wireless Access Point from a Browser

➢ **Check these items:**

- The wireless access point is correctly installed, it is powered on, and LAN connections are okay. Check that the Active LED and LAN LED are lit to verify that the Ethernet connection is okay.
- If your computer uses a fixed (static) IP address, ensure that it is using an IP address in the range of the wireless access point. The wireless access point’s default IP address is 192.168.0.100, its subnet mask is 255.255.255.0, and the DHCP client is disabled. Make sure that your network configuration settings are correct.
- If you are using the NetBIOS name of the wireless access point to connect, ensure that your computer and the wireless access point are on the same network segment or that your network includes a WINS server.
- If your computer is set to obtain an IP address automatically (DHCP client), restart it.
- Make sure that your browser has Java, JavaScript, or ActiveX enabled. If you are using Internet Explorer, click the **Refresh** button to be sure that the Java applet is loaded.
- Try quitting the browser, clearing the cache, deleting the cookies, and launching the browser again.
- Make sure that you are using the correct login information. The factory default login name is **admin**, and the password is **password**. Make sure that Caps Lock is off when entering this information.

➢ **If the wireless access point does not save changes you have made in the web management interface, check the following:**

- When entering configuration settings, be sure to click the **Apply** button before moving to another screen or tab, or your changes are lost.
- Click the **Refresh** or **Reload** button in the web browser. The changes might have occurred, but the web browser might be caching the old configuration.

When You Enter a URL or IP Address a Time-Out Error Occurs

A number of things could be causing this.

➢ **Try the following troubleshooting steps:**

- Check whether other computers on the LAN work correctly. If they do, ensure that your computer’s TCP/IP settings are correct. If you use a fixed (static) IP address, check the subnet mask, default gateway, DNS, and IP addresses of the wireless access point (see *Configure the IP Settings* on page 22).
- If the computer is configured correctly but still not working, ensure that the wireless access point is connected and turned on. Access it and check its settings. If you cannot connect to the wireless access point, check the LAN and power connections.
- If the wireless access point is configured correctly, check your Internet connection (for example, your cable modem) to make sure that it is working correctly.

Troubleshoot a TCP/IP Network Using the Ping Utility

Most TCP/IP terminal devices and routers contain a ping utility that sends an echo request packet to the designated device. The device then responds with an echo reply. You can easily troubleshoot a TCP/IP network by using the ping utility in your computer.

- *Test the LAN Path to Your Wireless Access Point*
- *Test the Path from Your Computer to a Remote Device*

Test the LAN Path to Your Wireless Access Point

You can ping the wireless access point from your computer to verify that the LAN path to your wireless access point is set up correctly.

➢ **To ping the wireless access point from a computer running Windows 95 or later:**

1. From the Windows toolbar, click the **Start** button, and select **Run**.
2. In the field provided, type **`ping`** followed by the IP address of the wireless access point, as in this example:

   ```
   ping 192.168.0.100
   ```
3. Click the **OK** button.

   You should see a message like this one:

   ```
   Pinging <IP address> with 32 bytes of data
   ```

   If the path is working, you see this message:

   ```
   Reply from < IP address >: bytes=32 time=NN ms TTL=xxx
   ```

If the path is not working, you see this message:

```
Request timed out
```

If the path is not functioning correctly, you might have one of the following problems:

- Wrong physical connections:
    - Make sure that the Active LED and LAN LED are lit. If one or both of these LEDs are off, follow the instructions in *LAN LED Is Not Lit* on page 101.
    - Check that the corresponding link LEDs are lit on the hub, switch, or router ports that are connected to your computer and the wireless access point.
- Wrong network configuration:
    - Verify that the Ethernet card driver software and TCP/IP software are both installed and configured on your computer.
    - Verify that the IP address for your wireless access point and your workstation are correct and that the addresses are on the same subnet.

Test the Path from Your Computer to a Remote Device

After verifying that the LAN path works correctly, test the path from your computer to a remote device.

1. From the Windows toolbar, click the **Start** button, and select **Run**.
2. In the Windows Run window, type:

   ping -n 10 <*IP address*>

   where <*IP address*> is the IP address of a remote device such as the DNS server of your ISP.

If the path is functioning correctly, replies as in the previous section display. If you do not receive replies:

- Check that your computer has the IP address of your router listed as the default wireless access point. If the IP configuration of your computer is assigned by DHCP, this information is not visible in your computer’s Network Control Panel. Verify that the IP address of the router is listed as the default wireless access point.
- Check to see that the network address of your computer (the portion of the IP address specified by the netmask) is different from the network address of the remote device.
- Check that your cable or DSL modem is connected and functioning.
- If your ISP assigned a host name to your computer, enter that host name as the account name in the basis General system settings screen (see *Configure Basic General System Settings and Time Settings* on page 20).

Problems with Date and Time

The Time screen that is accessible through the Configuration > System > Basic > Time menu choices displays the current date and time of day. The wireless access point uses the Network Time Protocol (NTP) to obtain the current time from a network time server on the Internet that you specify in the Time screen (see *Configure Basic General System Settings and Time Settings* on page 20). Each entry on the Logs screen is stamped with the date and time of day. Problems with the date and time function can include the following:

- Date and time shown is Thu Jan 1 08:00:41 CST 1970 or a similar incorrect date and time. Cause: The wireless access point has not yet successfully reached the network time server. Check that your Internet access settings are configured correctly. If you have just completed configuring the wireless access point, wait at least five minutes and check the date and time again.
- The day is correct or one day ahead or behind, and the hours are ahead or behind. Cause: You have selected an incorrect time zone for your area. Specify the correct time zone on the Time screen (see *Configure Basic General System Settings and Time Settings* on page 20).

Supplemental Information

A

This appendix provides factory default settings and technical specifications for the wireless access point. The appendix includes the following sections:

- *Technical Specifications*
- *Factory Default Settings*

Technical Specifications

The following table lists the technical specifications of the wireless access point:

Table 5. Technical specifications

Feature	Description
802.11b/bg/ng wireless specifications	
802.11b data rates	1, 2, 5.5, and 11 Mbps, and auto-rate capable (referred to as Best)
802.11bg data rates	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps, and auto-rate capable (referred to as Best)
802.11ng MCS index and data rates	Data rates for a 20 MHz channel width and an automatic guard interval: 0 / 7.2 Mbps, 1 / 14.4 Mbps, 2 / 21.7 Mbps, 3 / 28.9 Mbps, 4 / 43.3 Mbps, 5 / 57.8 Mbps, 6 / 65 Mbps, 7 / 72.2 Mbps, 8 / 14.44 Mbps, 9 / 28.88 Mbps, 10 / 43.33 Mbps, 11 / 57.77 Mbps, 12 / 86.66 Mbps, 13 / 115.56 Mbps, 14 / 130 Mbps, 15 / 144.44 Mbps and auto-rate capable (referred to as Best)
	Data rates for a 20 MHz channel width and a long guard interval (800 ms): 0 / 6.5 Mbps, 1 / 13 Mbps, 2 / 19.5 Mbps, 3 / 26 Mbps, 4 / 39 Mbps, 5 / 52 Mbps, 6 / 58.5 Mbps, 7 / 65 Mbps, 8 / 13 Mbps, 9 / 26 Mbps, 10 / 39 Mbps, 11 / 52 Mbps, 12 / 78 Mbps, 13 / 104 Mbps, 14 / 117 Mbps, 15 / 130 Mbps and auto-rate capable (referred to as Best)
	Data rates for a 40 MHz channel width and an automatic guard interval: 0 / 15 Mbps, 1 / 30 Mbps, 2 / 45 Mbps, 3 / 60 Mbps, 4 / 90 Mbps, 5 / 120 Mbps, 6 / 135 Mbps, 7 / 150 Mbps, 8 / 30 Mbps, 9 / 60 Mbps, 10 / 90 Mbps, 11 / 120 Mbps, 12 / 180 Mbps, 13 / 240 Mbps, 14 / 270 Mbps, 15 / 300 Mbps and auto-rate capable (referred to as Best)
	Data rates for a 40 MHz channel width and a long guard interval (800 ms): 0 / 13.5 Mbps, 1 / 27 Mbps, 2 / 40.5 Mbps, 3 / 54 Mbps, 4 / 81 Mbps, 5 / 108 Mbps, 6 / 121.5 Mbps, 7 / 135 Mbps, 8 / 27 Mbps, 9 / 54 Mbps, 10 / 81 Mbps, 11 / 108 Mbps, 12 / 162 Mbps, 13 / 216 Mbps, 14 / 243 Mbps, 15 / 270 Mbps and auto-rate capable (referred to as Best)
802.11b/bg/ng operating frequencies	2.412–2.472 GHz
802.11 b/bg/ng encryption	• 64-bit, 128-bit, and 52-bit WEP • AES • TKIP
Management and other specifications	
Network management	• Remote configuration and management through the web management interface, through SNMP, or through Telnet or SSH with the command-line interface (CLI). • SNMP management supports SNMP MIB I, MIB II, 802.11 MIB, and proprietary configuration MIB.
Maximum clients	Limited by the amount of wireless network traffic generated by each node; a maximum of 64 clients is supported.

Table 5. Technical specifications (continued)

Feature	Description
Status LEDs	• Power LED • Test LED • LAN LED • WLAN LED
Electrical and physical specifications	
Power adapter	12VDC, 1A; plug is localized to country of sale
Power consumption	4.0W
Physical specifications	• Dimensions (h x w x d): 35 x 133 x 173 mm (1.4 x 5.3 x 6.8 in.) • Weight: 240 g (0.5 lb)
Environmental specifications	• Operating temperature: 0 to 45°C (32 to 113°F) Operating humidity: 10–90%, noncondensing • Storage temperature: –20 to 70°C (–4 to 158°F) Storage humidity: 5–95%, noncondensing
MTBF	• At 25°C > 375,000 hours • At 50°C > 125,000 hours
Electromagnetic compliance	SRRC

Factory Default Settings

You can use the Reset to Factory Defaults button located on the bottom panel of the wireless access point to reset all settings to their factory default. This is called a hard reset.

To perform a hard reset, use a sharp object to press and hold the **Reset to Factory Defaults** button for approximately 10 seconds. This returns the wireless access point to the factory configuration settings that are shown in the following table.

Note: Pressing the Reset to Factory Defaults button for a few seconds simply causes the wireless access point to reboot.

Table 6. Default configuration settings

Feature	Description
Login for management and configuration	
LAN management address	192.168.0.100
Subnet mask for management address	255.255.255.0
Required static address for management computer	192.168.0.210 and 255.255.255.0
User name (case-sensitive) for login	admin
Login password (case-sensitive) for login	password
LAN and management features	
DHCP client	Disabled
Untagged VLAN	Enabled, VLAN ID 1
Management VLAN	VLAN ID 1
SNMP	Disabled
Syslog	Disabled
Spanning Tree Protocol (STP)	Disabled
Secure Shell (SSH)	Enabled
Hotspot	Disabled
Secure Telnet	Disabled
Time zone	USA-Pacific
NTP client	Enabled
Custom NTP server	Disabled
Port speed	10/100/1000
Ethernet MAC address	See label
DHCP server	
DHCP server	Disabled
DHCP server VLAN ID	1
DHCP server IP range start address	192.168.0.2
DHCP server IP range start address	192.168.0.50
DHCP server subnet mask	255.255.255.0

Table 6. Default configuration settings (continued)

Feature		Description
	DHCP server gateway IP address	192.168.0.1
	DHCP server IP address lease for clients	1 (one day)
Radio and wireless settings		
	Operating mode	Access point, infrastructure mode
	Wireless access point name	netgearxxxxxx, where xxxxxx are the last 6 digits of the wireless access point MAC address
	Country and region	Varies by region
	Wireless communication	2.4 GHz radio enabled
	Wireless mode	11ng
	Wireless network name (SSID)	NETGEAR_11ng
	Broadcast wireless network name (SSID)	Enabled
	Radio frequency channels	11ng: Auto
	MCS index/data rate (transmission speed)	Best **Note:** Maximum wireless signal rate derived from IEEE Standard 802.11 specifications. Actual throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.
	Channel width	11ng: 20 MHz
	Guard interval	Auto
	Output power	Full
	Wireless on/off (radio scheduling)	Disabled
	RTS threshold	2347
	Fragmentation length	2346
	Beacon interval	100
	Aggregation length	65535
	A-MPDU	Enabled
	RIFS transmission	Disabled
	DTIM interval	3
	Preamble type	Auto

Table 6. Default configuration settings (continued)

Feature		Description
	Antenna	Internal
	802.11d	Enabled
	Client isolation	Disabled
	Maximum wireless clients	64
	Wi-Fi Multimedia (WMM)	Enabled
	WMM powersave	Enabled
	AP EDCA parameters (QoS settings)	See the table in *Configure Advanced Quality of Service Settings* on page 73.
	Station EDCA parameters (QoS settings)	
	Wireless bridging	Disabled
Default wireless profile and profile security		
	Profile name	NETGEAR
	Profile state	Enabled
	Wireless network names (SSIDs)	NETGEAR_11ng
	Broadcast wireless network names (SSIDs)	Enabled
	Network authentication	Open system (no authentication)
	Data encryption	None
	Wireless client security separation	Disabled
	VLAN ID	1
Wireless security features		
	Rogue AP detection	Disabled
	MAC authentication	Disabled
	RADIUS servers	None
	RADIUS authentication port number	1812
	RADIUS shared secret	sharedsecret
	RADIUS accounting port number	1813
	RADIUS reauthentication time	3600 seconds
	RADIUS update of the global key	1800 seconds

B. Command-Line Reference

B

The wireless access point can be configured through either the command-line interface (CLI), a web browser, or a MIB browser.

The CLI allows viewing and modification of the configuration from a terminal or computer through a Telnet or SSH connection.

```
Keyword                                             Description
---------------------------------------------------------------------------------------------
|-backup-configuration                            --Backup configuration
|
|-config>                                         --Configuration setting
| |-country                                       --Country/region
| |
| |-dhcp>                                         --DHCP server setting
| | |-dns1                                        --DNS1 server
| | |-dns2                                        --DNS2 server
| | |- gateway                                    --Default gateway
| | |-lease                                       --Lease time
| | |-start                                       --Start IP address
| | |-status                                      --Status
| | |-stop                                        --Stop IP address
| | |-subnet                                      --Subnet mask
| | |-vlan                                        --VLAN id
| | |-wins1                                       --WINS1 server
| | |-wins2                                       --WINS2 server
| |
| |-hotspot>                                      --Hotspot setting
| | |-redirect                                    --Hotspot redirection URL
| | |-status                                      --Hotspot status
| |
| |-ip>                                           --Set host IP
| | |-address                                     --Host IP address
| | |-dhcp-client                                 --Enable dhcp client
| | |-dns                                         --IP address of Primary DNS server
| | |-dns2                                        --IP address of Secondary DNS server
| | |-gateway                                     --IP address of default gateway
| | |-subnet                                      --IP address of Subnet mask
| |
| |-name                                         --Access point name
| |
| |-no>                                          --Reset
| | |-dhcp>                                      --DHCP server settings
| | | |-dns1                                     --DNS1 server
| | | |-dns2                                     --DNS2 server
| | | |-wins1                                    --WINS1 server
| | | |-wins2                                    --WINS1 server
| | |-radius>                                    --RADIUS server setting
| | | |-primary>                                 --Primary RADIUS server
| | | | |-auth port                              --Authentication port
| | | | |-auth secret                            --Authentication shared secret
| | | | |-auth server                            --Authentication server IP
| | | | |-acct port                              --Accounting port
| | | | |-acct secret                            --Accounting shared secret
| | | | |-acct server                            --Accounting server IP
| | | |-secondary>                               --Secondary RADIUS server
| | | | |-auth port                              --Authentication port
| | | | |-auth secret                            --Authentication shared secret
| | | | |-auth server                            --Authentication server IP
| | | | |-acct port                              --Accounting port
| | | | |-acct secret                            --Accounting shared secret
| | | | |-acct server                            --Accounting server IP
| |-radio>                                       --Wireless LAN interface setting
| | |-2.4                                        --2.4 GHz wireless LAN status
| | |-2.4>                                       --2.4 GHz wireless LAN interface setting
| | | |-80211d                                   --802.11D
| | | |-aggregation-length                       --Aggregated packet size
| | | |-ampdu                                    --Aggregated MAC Protocol Data Unit
| | | |-beacon-interval                          --Wireless beacon period in TU(1024 us)
| | | |-channel                                  --Wireless channel (depends on country
| | | |                                              and wireless mode)
| | | |-channel auto                             --Set wireless channel to auto mode
| | | |-channel-width                            --Wireless channel width
| | | |-client-isolation                         --Client isolation status
| | | |-data-rate>                               --Wireless transmission date rate
| | | | |-best                                   --Best date rate
| | | | |-mcs                                    --Date rate (MCS Index)
| | | | |-rate                                   --Date rate (in Mbps)
| | | |-dtim                                     --Wireless DTIM period in beacon interval
| | | |-fragmentation-length                     --Wireless fragmentation threshold
| | | |-guard-interval                           --Guard interval (from interference from
| | | |                                              other transmissions)
| | | |-macacl add                               --Add wireless access control (ACL)
| | | |-macacl del                               --Delete wireless access control (ACL)
| | | |-macacl del all                           --Delete wireless access control (ACL)
| | | |                                              database
| | | |-max-client                               --Maximum client
| | | |-power                                    --Output power
| | | |-preamble-type                            --Wireless preamble (only effect on
| | | |                                              802.11b rates)
| | | |-rifs-transmission                        --Enable successive frame transmission
| | | |                                              at different transmit
| | | |-rogue-ap-detection                       --Enable rogue access point detection
| | | |-rogue-ap-detection knownap add           --Add rogue access point detection
| | | |-rogue-ap-detection knownap del MAC       --Delete rogue access point detection
| | | |-rogue-ap-detection knownap del all       --Delete rogue access point detection
| | | |                                              Database
| | | |-rts-threshold                            --Wireless RTS/CTS threshold
| | | |-wds                                      --Wireless Bridge status
| | | |-wds>                                     --Wireless Bridge setting
| | | | |-1                                      --1st WDS security profile status
| | | | |-1>                                     --1st security profile
| | | | | |-authentication                       --Authentication type
| | | | | |-authentication open encryption       --Data encryption
| | | | | |-name                                 --Profile name
| | | | | |-remote-mac                           --Remote MAC
| | | | | |-wep-key                              --Wireless WEP key
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | | |
| | | | |-2                                      --2nd WDS security profile status
| | | | |-2>                                     --2nd security profile
| | | | | |-authentication                       --Authentication type
| | | | | |-authentication open encryption       --Data encryption
| | | | | |-name                                 --Profile name
| | | | | |-remote-mac                           --Remote MAC
| | | | | |-wep-key                              --Wireless WEP key
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | | |
| | | | |-3                                      --3rd WDS security profile status
| | | | |-3>                                     --3rd security profile
| | | | | |-authentication                       --Authentication type
| | | | | |-authentication open encryption       --Data encryption
| | | | | |-name                                 --Profile name
| | | | | |-remote-mac                           --Remote MAC
| | | | | |-wep-key                              --Wireless WEP key
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | | |
| | | | |-4                                      --4th WDS security profile status
| | | | |-4>                                     --4th security profile
| | | | | |-authentication                       --Authentication type
| | | | | |-authentication open encryption       --Data encryption
| | | | | |-name                                 --Profile name
| | | | | |-remote-mac                           --Remote MAC
| | | | | |-wep-key                              --Wireless WEP key
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | |
| | | | |-allow_sta                              --Enable wireless client association
| | | | |-mode                                   --WDS mode
| | | |
| | | |-wireless-mode                            --Radio policy
| | | |
| | | |-wlan>                                    --Create security profile
| | | | |-1                                      --1st security enable
| | | | |-1>                                     --1st security profile
| | | | | |-access-control                       --Access control enable
| | | | | |-access-control-policy                --Access control policy enable
| | | | | |-authentication                       --Wireless authentication type
| | | | | |-authentication 8021x                 --Select wireless 802.1X authentication
| | | | | |                                          type
| | | | | |-authentication open encryption       --Select wireless open encryption
| | | | | |                                          authentication type
| | | | | |-authentication shared-key encryption --Wireless shared-key encryption
| | | | | |-broadcast                            --Broadcast enable
| | | | | |-dynamic-vlan                         --Dynamic VLAN id
| | | | | |-key-index>                           --WEP key index
| | | | | | |-1>                                 --Key 1
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-2>                                 --Key 2
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-3>                                 --Key 3
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-4>                                 --Key 4
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | |-name                                 --Profile name
| | | | | |-security-separation                  --Disable associated wireless client
| | | | | |                                          communication
| | | | | |-ssid                                 --Network name (1-32 chars)
| | | | | |-vlan                                 --VLAN id
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | | |
| | | |
| | | | |-2                                      --2nd security profile enable
| | | | |-2>                                     --2nd security profile
| | | | | |-access-control                       --Access control enable
| | | | | |-access-control-policy                --Access control policy enable
| | | | | |-authentication                       --Wireless authentication type
| | | | | |-authentication 8021x                 --Select wireless 802.1X authentication
| | | | | |                                           type
| | | | | |-authentication open encryption       --Select wireless open encryption
| | | | | |                                           authentication type
| | | | | |-authentication shared-key encryption --Wireless shared-key encryption
| | | | | |-broadcast                           --Broadcast enable
| | | | | |-dynamic-vlan                        --Dynamic VLAN id
| | | | | |-key-index>                          --WEP key index
| | | | | | |-1>                               --Key 1
| | | | | | | |-wep-key                        --Wireless WEP key
| | | | | | |
| | | | | | |-2>                               --Key 2
| | | | | | | |-wep-key                        --Wireless WEP key
| | | | | | |
| | | | | | |-3>                               --Key 3
| | | | | | | |-wep-key                        --Wireless WEP key
| | | | | | |
| | | | | | |-4>                               --Key 4
| | | | | | | |-wep-key                        --Wireless WEP key
| | | | | | |
| | | | | |-name                                --Profile name
| | | | | |-security-separation                 --Disable associated wireless client
| | | | | |                                         communication
| | | | | |-ssid                                --Network name (1-32 chars)
| | | | | |-vlan                                --VLAN id
| | | | | |-wpa-passphrase                      --Wireless WPA passphrase
| | | | |
| | | |
| | | | |-3                                     --3rd security profile enable
| | | | |-3>                                    --3rd security profile
| | | | | |-access-control                      --Access control enable
| | | | | |-access-control-policy               --Access control policy enable
| | | | | |-authentication                      --Wireless authentication type
| | | | | |-authentication 8021x                --Select wireless 802.1X authentication
| | | | | |                                         type
| | | | | |-authentication open encryption      --Select wireless open encryption
| | | | | |                                         authentication type
| | | | | |-authentication shared-key encryption --Wireless shared-key encryption
| | | | | |-broadcast                           --Broadcast enable
| | | | | |-dynamic-vlan                        --Dynamic VLAN id
| | | | | |-key-index>                          --WEP key index
| | | | | | |-1>                               --Key 1
| | | | | | | |-wep-key                        --Wireless WEP key
| | | | | | |
| | | | | | |-2>                               --Key 2
| | | | | | | |-wep-key                        --Wireless WEP key
| | | | | | |
| | | | | | |-3>                               --Key 3
| | | | | | | |-wep-key                        --Wireless WEP key
| | | | | | |
| | | | | | |-4>                               --Key 4
| | | | | | | |-wep-key                        --Wireless WEP key
| | | | | | |
| | | | | |-name                                 --Profile name
| | | | | |-security-separation                  --Disable associated wireless client
| | | | | |                                          communication
| | | | | |-ssid                                 --Network name (1-32 chars)
| | | | | |-vlan                                 --VLAN id
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | | |
| | | |
| | | | |-4                                      --4th security profile enable
| | | | |-4>                                     --4th security profile
| | | | | |-access-control                       --Access control enable
| | | | | |-access-control-policy                --Access control policy enable
| | | | | |-authentication                       --Wireless authentication type
| | | | | |-authentication 8021x                 --Select wireless 802.1X authentication
| | | | | |                                          type
| | | | | |-authentication open encryption       --Select wireless open encryption
| | | | | |                                          authentication type
| | | | | |-authentication shared-key encryption --Wireless shared-key encryption
| | | | | |-broadcast                            --Broadcast enable
| | | | | |-dynamic-vlan                         --Dynamic VLAN id
| | | | | |-key-index>                           --WEP key index
| | | | | | |-1>                                 --Key 1
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-2>                                 --Key 2
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-3>                                 --Key 3
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-4>                                 --Key 4
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | |-name                                 --Profile name
| | | | | |-security-separation                  --Disable associated wireless client
| | | | | |                                          communication
| | | | | |-ssid                                 --Network name (1-32 chars)
| | | | | |-vlan                                 --VLAN id
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | | |
| | | |
| | | | |-5                                      --5th security profile enable
| | | | |-5>                                     --5th security profile
| | | | | |-access-control                       --Access control enable
| | | | | |-access-control-policy                --Access control policy enable
| | | | | |-authentication                       --Wireless authentication type
| | | | | |-authentication 8021x                 --Select wireless 802.1X authentication
| | | | | |                                          type
| | | | | |-authentication open encryption       --Select wireless open encryption
| | | | | |                                          authentication type
| | | | | |-authentication shared-key encryption --Wireless shared-key encryption
| | | | | |-broadcast                            --Broadcast enable
| | | | | |-dynamic-vlan                         --Dynamic VLAN id
| | | | | |-key-index>                           --WEP key index
| | | | | | |-1>                                 --Key 1
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-2>                                 --Key 2
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-3>                                 --Key 3
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-4>                                 --Key 4
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | |-name                                 --Profile name
| | | | | |-security-separation                  --Disable associated wireless client
| | | | | |                                          communication
| | | | | |-ssid                                 --Network name (1-32 chars)
| | | | | |-vlan                                 --VLAN id
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | | |
| | | |
| | | | |-6                                      --6th security profile enable
| | | | |-6>                                     --6th security profile
| | | | | |-access-control                       --Access control enable
| | | | | |-access-control-policy                --Access control policy enable
| | | | | |-authentication                       --Wireless authentication type
| | | | | |-authentication 8021x                 --Select wireless 802.1X authentication
| | | | | |                                          type
| | | | | |-authentication open encryption       --Select wireless open encryption
| | | | | |                                          authentication type
| | | | | |-authentication shared-key encryption --Wireless shared-key encryption
| | | | | |-broadcast                            --Broadcast enable
| | | | | |-dynamic-vlan                         --Dynamic VLAN id
| | | | | |-key-index>                           --WEP key index
| | | | | | |-1>                                 --Key 1
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-2>                                 --Key 2
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-3>                                 --Key 3
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-4>                                 --Key 4
| | | | | | | |-wep-key                         --Wireless WEP key
| | | | | | |
| | | | | |-name                                --Profile name
| | | | | |-security-separation                 --Disable associated wireless client
| | | | | |                                         communication
| | | | | |-ssid                                --Network name (1-32 chars)
| | | | | |-vlan                                --VLAN id
| | | | | |-wpa-passphrase                      --Wireless WPA passphrase
| | | | |
| | | |
| | | | |-7                                     --7th security profile enable
| | | | |-7>                                    --7th security profile
| | | | | |-access-control                      --Access control enable
| | | | | |-access-control-policy               --Access control policy enable
| | | | | |-authentication                      --Wireless authentication type
| | | | | |-authentication 8021x                --Select wireless 802.1X authentication
| | | | | |                                         type
| | | | | |-authentication open encryption      --Select wireless open encryption
| | | | | |                                         authentication type
| | | | | |-authentication shared-key encryption --Wireless shared-key encryption
| | | | | |-broadcast                           --Broadcast enable
| | | | | |-dynamic-vlan                        --Dynamic VLAN id
| | | | | |-key-index>                          --WEP key index
| | | | | | |-1>                                 --Key 1
| | | | | | | |-wep-key                         --Wireless WEP key
| | | | | | |
| | | | | | |-2>                                 --Key 2
| | | | | | | |-wep-key                         --Wireless WEP key
| | | | | | |
| | | | | | |-3>                                 --Key 3
| | | | | | | |-wep-key                         --Wireless WEP key
| | | | | | |
| | | | | | |-4>                                 --Key 4
| | | | | | | |-wep-key                         --Wireless WEP key
| | | | | | |
| | | | | |-name                                --Profile name
| | | | | |-security-separation                 --Disable associated wireless client
| | | | | |                                         communication
| | | | | |-ssid                                --Network name (1-32 chars)
| | | | | |-vlan                                --VLAN id
| | | | | |-wpa-passphrase                      --Wireless WPA passphrase
| | | | |
| | | |
| | | | |-8                                     --8th security profile enable
| | | | |-8>                                    --8th security profile
| | | | | |-access-control                      --Access control enable
| | | | | |-access-control-policy               --Access control policy enable
| | | | | |-authentication                      --Wireless authentication type
| | | | | |-authentication 8021x                 --Select wireless 802.1X authentication
| | | | | |                                         type
| | | | | |-authentication open encryption        --Select wireless open encryption
| | | | | |                                         authentication type
| | | | | |-authentication shared-key encryption --Wireless shared-key encryption
| | | | | |-broadcast                            --Broadcast enable
| | | | | |-dynamic-vlan                         --Dynamic VLAN id
| | | | | |-key-index>                           --WEP key index
| | | | | | |-1>                                 --Key 1
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-2>                                 --Key 2
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-3>                                 --Key 3
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | | |-4>                                 --Key 4
| | | | | | | |-wep-key                          --Wireless WEP key
| | | | | | |
| | | | | |-name                                 --Profile name
| | | | | |-security-separation                  --Disable associated wireless client
| | | | | |                                         communication
| | | | | |-ssid                                 --Network name (1-32 chars)
| | | | | |-vlan                                 --VLAN id
| | | | | |-wpa-passphrase                       --Wireless WPA passphrase
| | | | |
| | | |
| | | |
| | | |-wmm>                                     --WMM settings
| | | | |-enable                                 --WMM enable
| | | | |-parameter>                             --Qos parameter
| | | | | |-ap>                                  --AP
| | | | | | |-queue>                             --Queue
| | | | | | | |-0                                --Access point best effort voice data
| | | | | | | |-1                                --Access point low-priority data
| | | | | | | |-2                                --Access point video data
| | | | | | | |-3                                --Access point voice data
| | | | | | |
| | | | | |-sta>                                 --Station
| | | | | | |-queue>                             --Queue
| | | | | | | |-0                                --Station best effort voice data
| | | | | | | |-1                                --Station low-priority data
| | | | | | | |-2                                --Station video data
| | | | | | | |-3                                --Station voice data
| | | | | | |
| | | | | |
| | | | |-powersave                              --WMM power save enable
| | | |
| | |
| |
| |-radius>                                        --RADIUS server settings
| | |-primary>                                    --Primary RADIUS server
| | | |-auth port>                                --Authentication port
| | | |-auth secret>                              --Authentication Shared secret
| | | |-auth server>                              --Authentication server
| | | |-acct port>                                --Accounting port
| | | |-acct secret>                              --Accounting Shared secret
| | | |-acct server>                              --Accounting server
| | |
| |
| | |-secondary>                                  --Secondary RADIUS server
| | | |-auth port>                                --Authentication port
| | | |-auth secret>                              --Authentication Shared secret
| | | |-auth server>                              --Authentication server
| | | |-acct port>                                --Accounting port
| | | |-acct secret>                              --Accounting Shared secret
| | | |-acct server>                              --Accounting server
| | |
| |
| |-remote>                                        --Remote access settings
| | |-ssh                                         --Enable remote access via SSH
| | |-telnet                                      --Enable remote access via Telnet
| |
| |-snmp-setting>                                  --SNMP settings
| | |-read community                              --SNMP Read Community
| | |-read-write community                        --SNMP Read Write Community
| | |-snmp-status                                 --SNMP status
| | |-trap community                              --SNMP Trap Community
| | |-trap server                                 --SNMP Trap Server IP address
| | |-trap-port                                   --SNMP Trap port
| |
| |-spanning-tree status                           --Enable spanning tree protocol
| |
| |-syslog>                                        --Syslog setting
| | |-port                                        --Syslog server port number
| | |-server                                      --Syslog server IP address
| | |-status                                      --Enable syslog client
| |
| |-time-settings>                                 --Time Setting
| | |-ntp>                                        --NTP sever settings
| | | |-client                                    --Client enable
| | | |-custom-server                             --Custom server enable
| | | |-server                                    --Server host name
| | |
| | |-timezone                                    --Time zone
| |
| |-vlan>                                          --VLAN settings
| | |-management-vlan                             --Management VLAN id
| | |-untagged-vlan id                            --Untagged VLAN id
| | |-untagged-vlan-status                        --Untagged VLAN status
| |
|
|-exit                                           --Logout from CLI
|-firmware-upgrade                               --Upload new system firmware file from
|                                                    FTP server
|-firmware-upgrade-tftp                          --Upload new system firmware file from
|                                                    TFTP server
|-reset-ap                                       --Reset the ap
|-restore-configuration                          --Restore system configuration
|-restore-default-password                       --Restore default system password
|-restore-factory-default                        --Restore default system configurations
|-save-and-activate                              –-Save and activate configuration
|-show>                                          --Show system settings
| |-country                                      --Show Country
| |-dhcp                                         --Show DHCP settings
| |-ethernet>                                    --Ethernet interface
| | |-statistics                                 --Show ethernet statistics
| |-hotspot                                      --Show hotspot settings
| |-ip>                                          --IP settings
| | |-config                                     --Show IP configurations
| | |-status                                     --Show IP status
| |-log                                          --Show system logs
| |-name                                         --Show ap name
| |
| |-radio>
| | |-2.4                                        --Show 2.4GHz wlan interface settings
| | |-2.4>                                       --2.4GHz wlan interface settings
| | | |-associated-client                        --Associated client(s)
| | | |-macacl                                   --Wireless access control (ACL) mac
| | | |                                              address list
| | | |-rogue-ap-detection>                      --Rogue ap detection
| | | | |-known>                                 --Known
| | | | | |-scanned                              --Scanned list
| | | | | |-config                               --Config list
| | | | |
| | | | |-unknown                                --Unknown list
| | | |
| | | |-station-list                             --Station list
| | | |-statistics                               --Interface statistics
| | | |-wds>                                     --Wireless bridge settings
| | | | |-1                                      --1st security profile
| | | | |-2                                      --2nd security profile
| | | | |-3                                      --3rd security profile
| | | | |-4                                      --4th security profile
| | | |
| | | |-wlan>                                    --VAP settings
| | | | |-1                                      --1st security profile
| | | | |-2                                      --2nd security profile
| | | | |-3                                      --3rd security profile
| | | | |-4                                      --4th security profile
| | | | |-5                                      --5th security profile
| | | | |-6                                      --6th security profile
| | | | |-7                                      --7th security profile
| | | | |-8                                      --8th security profile
| | | |
| | | |-wmm                                      --WMM settings
| | |
| |
| |-radius>                                      --RADIUS server settings
| | |-primary                                    --Primary RADIUS server
| | |-secondary                                  --Secondary RADIUS server
| |
| |-remote                                       --Remote settings
| |-snmp-settings                                --SNMP settings
| |-software-version                             --Software version
| |-spanning-tree                                --Spanning tree settings
| |-syslog-settings                              --Syslog settings
| |-system info                                  --System information
| |-time-settings                                --Time settings
| |-vlan-settings                                --VLAN settings
| |
```

Notification of Compliance

C

NETGEAR wireless routers, gateways, APs

Regulatory Compliance Information

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

This product's firmware limits operation to only the channels allowed in a particular Region or Country. Therefore, all options described in this user's guide may not be available in your version of the product.

Europe – EU Declaration of Conformity

Products bearing the CE marking comply with the following EU directives:

- EMC Directive 2004/108/EC
- Low Voltage Directive 2006/95/EC

If this product has telecommunications functionality, it also complies with the requirements of the following EU Directive:

- R&TTE Directive 1999/5/EC

Compliance with these directives implies conformity to harmonized European standards that are noted in the EU Declaration of Conformity.

For indoor use only. Valid in all EU member states, EFTA states, and Switzerland.

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.

FCC Requirements for Operation in the United States

FCC Information to User

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals.

FCC Guidelines for Human Exposure

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

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

FCC Declaration of Conformity

We, NETGEAR, Inc., 350 East Plumeria Drive, San Jose, CA 95134, declare under our sole responsibility that the ProSAFE Single Band 802.11n Wireless Access Point WN203 complies with Part 15 Subpart B of FCC CFR47 Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Radio Frequency Interference Warnings & Instructions

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 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 methods:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an electrical outlet on a circuit different from that which the radio 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.
- For product available in the USA and Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.
- Pour les produits disponibles aux États-Unis / Canada du marché, seul le canal 1 à 11 peuvent être exploités. Sélection d'autres canaux n'est pas possible.
- This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.
- Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

Industry Canada

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution:

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

IMPORTANT NOTE: Radiation Exposure Statement:

This equipment complies with IC 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.

NOTE IMPORTANTE: Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Interference Reduction Table

The table below shows the recommended minimum distance between NETGEAR equipment and household appliances to reduce interference (in feet and meters).

Household Appliance	Recommended Minimum Distance (in feet and meters)
Microwave ovens	30 feet / 9 meters
Baby Monitor - Analog	20 feet / 6 meters
Baby Monitor - Digital	40 feet / 12 meters
Cordless phone - Analog	20 feet / 6 meters
Cordless phone - Digital	30 feet / 9 meters
Bluetooth devices	20 feet / 6 meters
ZigBee	20 feet / 6 meters

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