



**User Guide**

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## **Wireless LAN Outdoor Bridge Solution**

**3CRWEASY96A**

**Complete Building-to-Building Outdoor Wireless LAN Kit**

<http://www.3com.com/>  
<http://support.3com.com/registration/frontpg.pl/>

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# Contents

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## 1 Introduction

- Basic Network Topologies 7
  - Point-to-Point 7
  - Point-to-Multipoint 8
- Basic Operating Modes 9

---

## 2 Installing the Outdoor Bridge

- Installation Requirements 10
  - Power Requirements 10
  - Administration Requirements 11
- Installation Guidelines 11
  - Proper Grounding 11
  - Alignment 12
  - Polarization 12
  - Restrictions on Antenna Use 12
- Safety Information 13
- Mounting the Bridge to a Mast 14
- Connecting the Bridge to the LAN 15
  - Using the Power Supply 15
  - Using a Power-Over-Ethernet LAN Port 15
- Installing Software Utilities 16
- Establishing Wireless Association 17

---

## 3 Configuring the Building-to-Building Bridge

- Using the 3Com Wireless Device Manager 18
  - Launching a Wireless Device Configuration 18
  - Using the Pre-IP Configuration Wizard 20
  - Using the RSSI Monitor 20
- Saving Configuration Changes 21
- Changing System Properties 21
- Setting IP Network Properties 22

Setting up Protocol and Port Filtering	23
Setting Wireless Network Properties	24
Setting Advanced Performance Properties	26
Setting up an Ad Hoc Network	28
Optimizing an Ad Hoc Installation	29
Setting up an Access Point Infrastructure Network	30
Changing Security Settings	31
No Security (Open System)	32
40-bit Shared Key (Wi-Fi)	32
128-bit Shared Key	33
128-bit Dynamic Security Link	33
Setting up the Wireless Network Login	33
Resetting the Bridge	33
Restoring a Bridge to Factory Defaults	34
Upgrading the System	34
Changing the Administration Password	35
Backing up a Configuration	35
Restoring a Configuration	36
Viewing the Client List	36
Resetting Statistics Listings	37
Clearing the Client List	37
Viewing Connection Status	37
Viewing the System Summary	37
Interoperating with Third-Party Equipment	37

---

## 4 Troubleshooting

Diagnosing Problems	38
Disconnecting the Bridge	40
Uninstalling Software and Documentation	40
Upgrading Bridge Firmware	40

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## A Technical Support

Online Technical Services	41
Support from Your Network Supplier	42
Support from 3Com	42
Returning Products for Repair	43

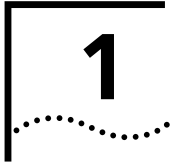
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## Regulatory Compliance Information

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## Index





# INTRODUCTION

The 3Com® Wireless LAN Outdoor Bridge Solution is a comprehensive building-to-building outdoor wireless LAN kit that reduces the need to evaluate, purchase and assemble separate components. One convenient package includes everything you need to offer an easy-to-manage building-to-building wireless LAN. The package features a 3Com Wireless LAN Building-to-Building Bridge with integrated antenna and power-over-Ethernet cable in a durable, weatherproof enclosure.

This all-in-one wireless LAN solution delivers three to four times the bandwidth of T1 links, with significantly lower operational costs. The wireless bridge lets you connect cross-campus buildings, or portable or temporary classrooms, at distances up to 16 kilometers (10 miles), where local regulations allow. The building-to-building bridge interoperates seamlessly with other Wi-Fi certified access points in large multi-vendor environments.

## BASIC NETWORK TOPOLOGIES

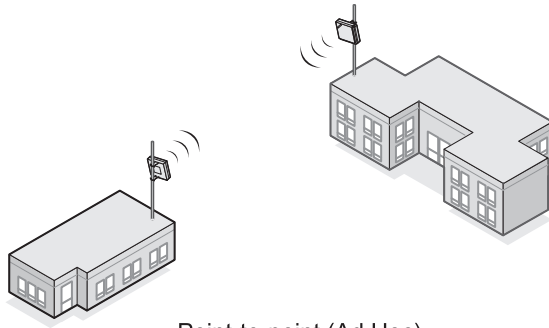
The 3Com bridge can be used in two types of wireless network topologies:

- Point-to-point
- Point-to-multipoint

### POINT-TO-POINT

Point-to-point topology is the simplest way to use the 3Com bridge, and it offers the highest performance level. Two 3Com outdoor bridges form a direct wireless

association between the wired LANs in two remote buildings. See the following diagram of the point-to-point topology.

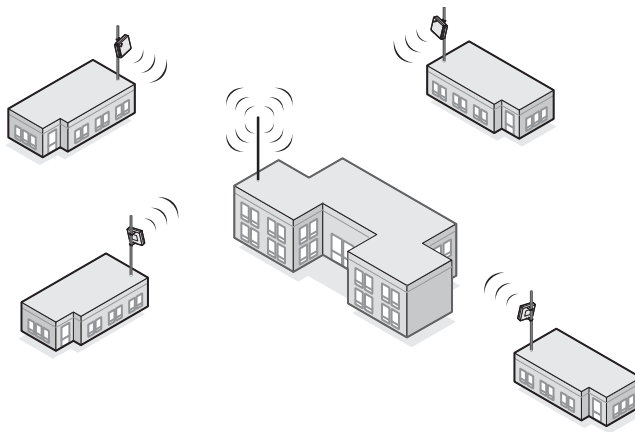


Point-to-point (Ad Hoc)

## POINT-TO-MULTIPOINT

Point-to-multipoint topology allows communication among three or more buildings. In the central building, an access point equipped with an omnidirectional antenna provides wireless association among the wired LANs in the other buildings where 3Com outdoor bridges are installed.

If a 3Com 11 Mbps Wireless LAN Access Point 8000 is used (with an 8dBi omnidirectional antenna) this topology can connect wired LANs over distances up to 10 kilometers (6 miles). If an access point from another Wi-Fi compliant manufacturer is used, the range depends on that manufacturer's device limitations.



Point-to-multipoint (Infrastructure)



## BASIC OPERATING MODES

Two operating modes relate to the basic WLAN topologies:

- Ad hoc mode is the basis for point-to-point topology. Operating in ad hoc mode, two outdoor bridges can associate without an access point, allowing the LANs to which they are connected to communicate.
- Access Point (Infrastructure) mode is the basis for point-to-multipoint topology. Operating in access point mode, multiple 3Com outdoor bridges act as clients to an Access Point 8000 or a Wi-Fi compliant access point from another manufacturer.

# 2

## INSTALLING THE OUTDOOR BRIDGE

This equipment must be installed in compliance with local and national building codes, regulatory restrictions, and FCC rules. For the safety of people and equipment, only professional network personnel should install the bridge, cables, and antennas.



**CAUTION:** Before installing, see the important warnings and cautions in “Safety Information” on page 13.

### INSTALLATION REQUIREMENTS

The following items are required for installation:

- For a point-to point configuration, two 3Com outdoor bridges.
- For a point-to-multipoint configuration, one 3Com 11Mbps Wireless LAN Access Point 8000 (or other Wi-Fi compliant access point) with an omnidirectional antenna for one building, and one 3Com outdoor bridge for each other building.
- Mounting hardware (supplied with each bridge).
- Properly grounded outdoor mast or wall mount.
- Lightning arrestor properly grounded at each building in the topology.
- Outdoor rated category 5 Ethernet cable (3Com part number 3CWE487 recommended).

### POWER REQUIREMENTS

The bridge complies with the IEEE 802.3af power-over-Ethernet standard. It receives power over outdoor rated Ethernet cable (3Com part number 3CWE487 recommended). Installation requires the use of either the 3Com power supply provided or IEEE 802.3af compliant power supply equipment (output power rated 48 V dc @ 200 mA minimum). Such equipment must be safety certified according to UL, CSA, IEC or other applicable national or international safety requirements

for the country of use. All references to the power supply in this document refer to equipment that meets these requirements.

Because the power supply plug is the only means of disconnecting the bridge from power, make sure the power outlet is accessible.

See "Using the Power Supply" on page 15 and "Using a Power-Over-Ethernet LAN Port" on page 15.



*Note for use of the 3Com power supply (part number 61-0107-000) in Norway: This product is also designed for use on an IT power system with phase-to-phase voltage of 230 V.*

## ADMINISTRATION REQUIREMENTS

To use the administration tool, which helps you select 3Com wireless LAN devices and launch their configuration management systems, you need a computer running one of the following operating systems and one of the following browsers:

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<b>Operating Systems</b>	Windows XP
	Windows 2000
	Windows NT 4.0
	Windows Me
	Windows 98
<b>Browsers</b>	Netscape 6.0 or later
	Internet Explorer 5.0 or later

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## INSTALLATION GUIDELINES

The 3Com outdoor bridge is housed in a durable, waterproof enclosure and is specifically designed for outdoor use in most climates. Optimal performance can be maintained at outdoor temperature ranges from -20° C to 50° C (-4° F to 122° F). It is extremely important to avoid mounting the bridge in any area where it could be vulnerable to extreme or hazardous conditions of any kind. Nor should the unit be mounted flush with the roof of a building.

## PROPER GROUNDING

To ensure the physical safety of anyone near the bridge and to prevent damage to the unit, follow the building codes for antenna installations in your area. Make certain that bridges and masts are appropriately grounded to prevent injury and

minimize damage from lightning strikes. A lightning arrestor, properly grounded and installed at each building in the topology, will protect networking equipment in the building, as well as the people working there, from lightning-induced surges that travel on Ethernet cables.

## **ALIGNMENT**

Position bridges so that they are aimed at each other wherever possible. While maintaining a direct line of sight between antennas helps to ensure a strong signal, it is not strictly necessary, nor is it always possible. Conditions such as long distances, mountainous regions, and architectural barriers could make a direct line of sight nearly impossible to achieve.

In a campus setting, where buildings are short distances apart, and especially in a point-to-point configuration, align each unit to point at the antenna with which it will communicate. If you place two units at different heights, tilt them up or down toward each other for optimal signal strength.

## **POLARIZATION**

Polarization is a physical phenomenon of radio signal propagation. In general, any two antennas that are to communicate with each other must be set for the same horizontal or vertical polarization. If polarization on both antennas does not match—a situation called *cross-polarization*—the link will either work poorly or not at all. Follow these polarization guidelines:

- Vertical polarization is preferred for point-to-multipoint configuration.
- For point-to-multipoint configurations, the omnidirectional antenna connected to the access point should be vertically aligned in relation to the ground.
- Unidirectional antennas that link with omnidirectional antennas should always be oriented for vertical polarization.

## **RESTRICTIONS ON ANTENNA USE**

The following restrictions apply to the use of the bridge's 18 dBi antenna:

- FCC regulations require that in the United States, use of channels 12 and 13 in conjunction with an 18 dBi antenna is allowed only at very reduced power, which the 3Com unit sets automatically.
- The highest allowable power level is set automatically when the country selection is made from the pulldown menu in the configuration tool.
- To work properly with 18 dBi antennas, bridges must be separated by at least 61 Meters (200 Feet).

# SAFETY INFORMATION



**WARNING:** Do not install the bridge near overhead power lines, electric light or power circuits, or where it can come into contact with such circuits. Provide ten feet or more clearance between the bridge and such power lines or circuits. Do not install the bridge flush with the rooftop or wall. When installing the bridge, do not come into contact with such circuits, which can cause serious injury or death. Follow local and national codes for proper installation and grounding of antennas.



**WARNING:** To comply with FCC radio frequency (RF) exposure limits, antennas should be located at least two meters (six feet) or more from the bodies of all persons.



**WARNING:** Do not install the bridge or connect and disconnect cables during periods of lightning activity.



**WARNING:** To avoid possible injury or damage to equipment, you must use either the provided power supply or IEEE 802.3af compliant power supply equipment that is safety certified according to UL, CSA, IEC, or other applicable national or international safety requirements for the country of use. All references to power supply in this document refer to equipment meeting these requirements.



**WARNING:** It is the responsibility of the installer to ensure that the Power-over-Ethernet (POE) power supply is properly connected. Connection to any other device, such as a standard Ethernet card or another POE supply, may result in permanent damage to equipment, electric shock, or fire. Refer to the installation instructions for proper installation.



**WARNING:** The 3Com power supply (part number 61-0107-000) input relies on a 16A rated building fuse or circuit protector for short circuit protection of the line to neutral conductors.



**CAUTION:** A lightning arrestor will not prevent damage from direct lightning strikes. It is extremely important to ensure that the bridge is installed at least 1 meter (3 feet) below the top of the grounded pole or mast.



**CAUTION:** If you supply your own Ethernet cable for connecting power, be sure that it is outdoor rated category 5 straight-through (8-wire) cable that has not been altered in any way (3Com part number 3CWE487 recommended). Use of nonstandard cable could damage the bridge.



**CAUTION:** Minimize damage from direct lightning strikes by mounting the bridge at least 1 Meter (3 feet) below the top of the mast.



# CONNECTING THE BRIDGE TO THE LAN

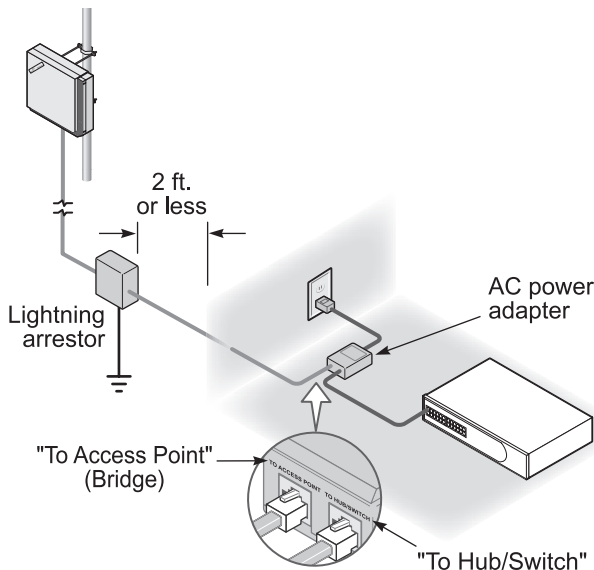
You can connect to the LAN either through the 3Com power supply or through IEEE 802.3af power-over-Ethernet compliant equipment.

## USING THE POWER SUPPLY

The power supply can be located indoors at any point between the bridge and the LAN access port where an accessible power outlet exists.

Connect the cable coming from the bridge to the port labeled *To Access Point* on the power supply.

Connect another Ethernet cable from the port labeled *To Hub/Switch* on the power supply to an Ethernet LAN port, as shown.

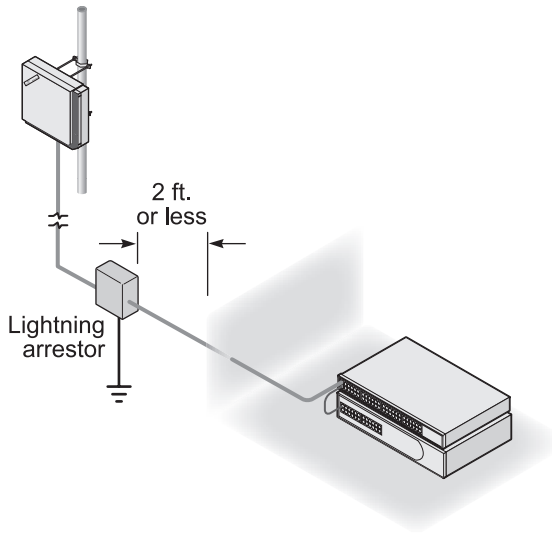


**CAUTION:** To avoid damaging network equipment, make sure that the cables are connected from bridge to power supply to LAN as shown and described above.

## USING A POWER-OVER-ETHERNET LAN PORT

If your LAN equipment complies with the IEEE 802.3af power-over-Ethernet standard, you can connect the bridge directly to a LAN port. For example, the

illustration shows the connection through a 3Com Ethernet Power Supply to a 3Com SuperStack® Switch.



## INSTALLING SOFTWARE UTILITIES

The 3Com installation CD includes the Wireless Infrastructure Device Manager tool, which helps you set up and administer the wireless components of your network. It also contains documentation, including the help files for device configuration screens.

To install the tool and documentation from the CD:

- 1 Power up the computer and insert the 3Com CD in the CD-ROM drive.
- 2 The setup menu should appear when the CD autostarts. If no menu appears, you can run the startup program from the Windows Start menu:  
*Start/Run/d:setup.exe* (where d: is the CD-ROM drive)
- 3 From the menu, select *Install the Tools and Documentation*. This option installs the 3Com Wireless Infrastructure Device Manager (WIDMAN) Tool, which you can use to monitor bridges and select devices for administrative changes. It also installs the User Guide in HTML and PDF formats.
- 4 Follow the instructions on the screen.



## ESTABLISHING WIRELESS ASSOCIATION

After the bridge and software utilities are installed, you can configure the bridge as follows:

- Launch the bridge configuration. (See “Configuring the Building-to-Building Bridge” on page 18 for details on how to launch the configuration and make changes.)
- For a point-to-point association between two bridges, see “Setting up an Ad Hoc Network” on page 28 and “Optimizing an Ad Hoc Installation” on page 29.
- For a point-to-multipoint association between an access point and one or more bridges, see “Setting up an Access Point Infrastructure Network” on page 30.

# 3

## CONFIGURING THE BUILDING-TO-BUILDING BRIDGE

If the configuration that was set at the factory does not meet your network requirements, or if you want to customize the settings, you can configure the bridge through your Web browser.

The 3Com Wireless Infrastructure Device Manager helps you locate 3Com wireless LAN devices on the network, select a device and view its properties, and launch the device's configuration in your Web browser. To configure a bridge, the device manager must be installed on a computer that has an Ethernet adapter and is running a supported Windows operating system and Web browser.

### USING THE 3COM WIRELESS DEVICE MANAGER

After the 3Com Wireless Device Manager is installed, ensure that the device to be configured is either wired to the network, associating with the wireless network, or connected directly to the computer, and connected to power. If more than one device using the factory default name is connected, make a note of the MAC address of the device you want to select so that you can identify it in the device manager.

#### LAUNCHING A WIRELESS DEVICE CONFIGURATION

If you do not have a DHCP server on your network, it can take up to one minute for a device to become discoverable after it has been powered up.

- 1 To launch the 3Com Device Manager, select *Start / Programs / 3Com Wireless / Wireless Infrastructure Device Manager*.

If you have more than one network adapter installed on your computer, you may be prompted to choose a network adapter. Choose the appropriate adapter and click *OK*.

The Wireless Network Tree appears in the 3Com Wireless Infrastructure Device Manager window. The tree lists all WLAN service areas on the network and expands to show the 3Com wireless LAN devices that are associated to each service area. Devices in a different subnet than your computer are

identified with exclamation points (!). You can refresh this display by clicking *Refresh*. You should refresh the display, for example, after you change a device IP address.

- 2 In the Wireless Network Tree, select the device you want to configure.  
If more than one wireless LAN device appears in the tree and you are not sure that you have selected the right one, click *Properties* and check the MAC address to verify that it is the one you want.

- 3 Click *Configure*.
  - If the selected device is on the same subnet as your computer, the Configuration Management System main page appears in your Web browser. (If a password is set on the device, enter it when prompted.)
  - If the selected device is on a different subnet, the Pre-IP Configuration Wizard is activated automatically. This wizard lets you configure the IP settings for the selected wireless device. It proposes IP address and subnet mask settings derived from your computer's settings, so the selected device will then reside on the same subnet as your computer. You can accept the suggested settings or change them as required. For more information, see "Using the Pre-IP Configuration Wizard" on page 20.

The next window prompts for an administrative password to allow the new IP address to be set. When the units are shipped from the factory, there is no administration password and you should leave the password field blank. If an administration password has been set for the device, enter the password and click *Next*. The 3Com Web Configuration Management System main screen appears in your Web browser.

The following table describes the functions of the buttons in the 3Com Wireless Infrastructure Device Manager window.

Button	Description
Properties	Displays the following properties of the selected device: Device Name, Device Type, Wireless LAN Service Area (ESSID), IP Address, Subnet Mask, and MAC Address.
Configure	Launches the Configuration Management System for the selected device. If the selected device is on a different subnet, you are prompted to assign an address on the same subnet as your computer.
Refresh	Scans the network and displays the connected 3Com 11 Mbps Wireless LAN devices.
Choose NIC	If your computer has more than one network interface card installed, allows you to choose which card you want to use.
Close	Closes the device manager window and ends the session.
Help	Launches the device manager help page in your browser.

## USING THE PRE-IP CONFIGURATION WIZARD

You can only configure devices that are on the same subnet as your computer. To configure a device on a different subnet, you must first assign it an IP address on the same subnet as your computer. After you launch the configuration, you can change settings as usual. Just before you finish, you must change the device IP address back to its original setting.

Follow this procedure:

- 1** In the Wireless Infrastructure Device Pre-IP Configuration window, accept the suggested settings or change them as required. You can assign a static IP address or specify that the device obtain its IP address from a DHCP server.
- 2** The next window prompts for an administrative password. When the units are shipped from the factory, there is no administration password and you should leave the password field blank. If an administration password has been set for the device, enter the password and click *Next*.

The Configuration Management System main page appears in your Web browser.

## USING THE RSSI MONITOR

The device manager can display a dynamic graphical representation of a device's received signal strength indication (RSSI). By monitoring the RSSI while making antenna adjustments, you can ensure optimal device placement and orientation.

To monitor signal strength, the devices must be set to the same BSSID and RSSI broadcasting must be enabled.

The following procedure uses the device manager RSSI Monitor to monitor the signal strength of two 3Com bridges:

- 1** In the device manager window, launch the first bridge configuration and configure for ad hoc mode.  
Enable RSSI broadcasting as follows:
  - a** In the main menu under System Configuration, click *Wireless Network*.
  - b** In the Wireless Network page, click the link to go to advanced wireless network configuration.
  - c** In the Advanced Wireless Network page, click the Broadcast RSSI On radio button, and click *Save*.
  - d** Note the device BSSID.  
In the main configuration menu under System Status, click *Connection Status*. The status window shows the BSSID.

- 2** Return to the device manager and repeat step 1 for the second bridge. Make sure that both bridges are using the same BSSID.  
If the bridges are not using the same BSSID, specify the BSSID on both bridges as follows:
  - a** In the Wireless Network page, select the following Network Mode: Ad-hoc (Peer-to-Peer) Specify.
  - b** Enter the BSSID in the spaces provided.
  - c** Click *Save*.
- 3** After you have enabled RSSI broadcasting on both bridges and verified that they are using the same BSSID, return to the device manager, select the first bridge, and click *Properties*.
- 4** In the device properties window, click *RSSI Monitor*.  
The RSSI Monitor window shows a graphical representation of bridge signal strength. A value of 30 indicates good strength; a value of 40 or above is very good. By adjusting the antenna position and orientation, you can improve the signal strength.

## SAVING CONFIGURATION CHANGES

Most pages in the configuration have two buttons: *Save* and *Clear*. After making changes on a page, you must click *Save* to store the modifications before moving to a new page. If you make a mistake, click *Clear* before saving to restore the original page settings.

To reduce the possibility of losing wireless association with an access point while you are configuring, security settings are stored when you click *Save* in the security pages, but they do not take effect until you click *Save* in the Wireless Network page. First configure security settings. Then go to the Wireless Network page and configure wireless network settings, including the Wireless LAN Service Area. The security settings take effect after you click *Save* in the Wireless Network page.

## CHANGING SYSTEM PROPERTIES

Under System Configuration, click *System Properties*. The System Properties page displays the properties of the selected device. You can modify properties by entering values in the fields and clicking the radio buttons. When you are finished, click *Save*. The following table describes the properties and default values.

Property	Description	Default Value
Device Name	This name appears in the System Summary window. You can change the default name to one of your choice.	3Com Bldg-to-Bldg Bridge
Device Location	Optionally, you can enter a location to identify where the device is installed. (For example, Building 4, Cubicle 3.)	None
Help File Location	<ul style="list-style-type: none"> <li>■ Web Server: Help files are located on the network at the specified Help File Path.</li> <li>■ Local Drive: Help files are located on the local computer at the specified Help File Path.</li> </ul>	Local Drive
Help File Path	<p>The location of the Configuration Management System help files on the web server or on the local drive.</p> <p>If you want to have access to help when you click the ? in the configuration pages, you must install the help from the 3Com CD. By default, help is installed on the local drive when you install the administration tool. If you install the help in a different location on the local drive or on a web server, you must set the Help File Path to the correct location.</p>	C:/Program Files/3Com/3Com Wireless Infrastructure Device Manager/ManagementHelp/B2B
Secure Web Server Connection	<p>Controls whether Secure Socket Layer (SSL) technology is used to encrypt information between the computer and the bridge during a configuration session. When this option is turned on, data is protected during the configuration session. When it is turned off, data could be intercepted during the configuration session.</p> <p>Changing this option causes the bridge to reset, which disrupts the network association temporarily, but does not affect bridge configuration settings that have already been saved. To ensure that changes to security settings are retained, either change this option before changing security settings, or click <i>Save</i> in the Wireless Network page after changing security settings and before changing this option.</p>	Off

## SETTING IP NETWORK PROPERTIES

Under System Configuration, click *IP Network*. The *IP Network Properties* page appears, where you can change the following settings. When you are finished, click *Save*.

- **IP Network Setting**—This setting allows you to change the device IP address. To let the device get an IP address automatically from a DHCP server, click *Obtain an IP address automatically*.

To specify an IP address, click *Specify an IP address*, enter the IP address parameters in the spaces provided.

After you change the IP address and click *Save*, you cannot continue to configure the device using the old IP address. To continue configuring this device after making this change, you must do the following:

- a Close your browser.
  - b Return to the 3Com Wireless Infrastructure Device Manager and click *Refresh*.
  - c Select the device and click *Configure* to start a new configuration session.
- **IP Address, Subnet Mask, Gateway IP Address**—Parameters for use when you click *Specify an IP address*. Enter the parameters in the spaces provided.

## SETTING UP PROTOCOL AND PORT FILTERING

Protocol filtering allows you to control the types of protocols that the bridge is authorized to transmit and receive. The default setting allows the following protocols to be transmitted and received:

- IPX
- NetBEUI
- UDP/IP
- TCP/IP

To set up a list of authorized protocols:

- 1 Under System Configuration, click *Protocol Filtering*.
- 2 In the Protocol Filtering page, click the Allow radio buttons next to the protocols that you want to authorize. Click the Block radio buttons next to the protocols that you want to disable.
- 3 Click *Save*.

If UDP/IP or TCP/IP protocols are authorized, you can set up port filtering, which allows you to control the protocol ports that are authorized to transport packets through the bridge. The default setting allows all protocol ports to transport packets.

The bridge allows you to filter up to 100 protocol port numbers. Valid protocol port numbers range from 1 to 65535.

To set up protocol port filtering:

- 1 Under System Configuration, click *Protocol Filtering*.
- 2 In the Protocol Filtering page, click the Allow radio button next to the UDP/IP or TCP/IP protocol (or click both buttons).
- 3 Select the Port Filtering Mode:  
**Allow**—If you want to block most protocol ports and allow a small number of others, use the Allow mode. Click the *Allow* radio button.  
**Block**—If you want to allow most protocol ports and block a small number of others, use the Block mode. Click the *Block* radio button.
- 4 Enter a protocol port number in the space provided and click *Save*.  
Repeat this step for all the protocol port numbers you want to allow or block.

To view the list of protocol ports or delete protocol ports from the list:

- 1 Click the link to view the protocol port list.
- 2 In the next page, click the check boxes next to the protocol port numbers and click *Delete*. (You may click *Reset* to clear all check boxes before clicking *Delete*.)

## SETTING WIRELESS NETWORK PROPERTIES

Under System Configuration, click *Wireless Network Properties*. The Wireless Network Properties page appears, where you can configure the items listed below and get access to advanced performance settings. When you are finished, click *Save*.



*Saving wireless network properties also causes security settings to take effect. After making changes to security settings, you must click Save in the Wireless Network Properties page to activate the security settings.*

- **Network Mode**—Click Access Point (Infrastructure) to associate with an access point. Click Ad-hoc (Peer-to-Peer) to associate in ad hoc mode. Click Ad-hoc (Peer-to-Peer) Specify if you want to specify the bridge's basic service set identification (BSSID).
- **BSSID**—When the network mode is Ad-hoc (Peer-to-Peer) Specify, you can specify the BSSID. Enter the BSSID in the spaces provided.
- **Wireless LAN Service Area**—This is the device ESSID. The default WLAN service area name is 3Com. You can use the default, enter a WLAN service area, or select one from the list



To maintain wireless association, the WLAN service area on a bridge and the device with which it is associated must match exactly. Therefore, if the bridge is set to specify the WLAN service area and you change the other device's WLAN service area, make sure to change the bridge WLAN service area also.

- **Access Point Privacy Mode**—This mode only applies when the network mode is Access Point (Infrastructure) and should only be used when access points are set with privacy enabled. (On 3Com access points, privacy is enabled when the Broadcast WLAN Service Area Name (ESSID) mode is disabled.) Click *On* to associate with access points set with privacy mode enabled. Click *Off* to associate with access points set with privacy mode disabled. When privacy mode is on, you must specify a Wireless LAN Service Area, which must match the access point service area exactly.
- **Channel Selection**—When the network mode is Access Point (Infrastructure), this option is set to *Automatically select the best channel*, and cannot be changed. In this case, the bridge uses the channel that the access point is using.



*FCC regulations require that in the United States, use of channels 12 and 13 in conjunction with an 18 dBi antenna is allowed only at very reduced power, which the 3Com bridge sets automatically.*

When the network mode is Ad-hoc (Peer-to-Peer) you can specify channel selection as follows:

- **Automatically select the best channel**—When this option is enabled, the bridge scans the primary channels. If the bridge is establishing a new ad hoc network, it chooses the channel with the least number of packets. If the bridge is joining an existing ad hoc network, it selects the channel in use.
- **Specify the channel to use**—To establish the channel for an ad hoc network, select this option on the first bridge and choose a channel from the Channel list. On the second bridge, set the channel selection to match the first bridge.
- **Country Selection (Outdoor Bridge only)**—Select the country from the pull-down list. The highest allowable power level is automatically set.
- **Antenna Selection (Indoor Bridge only)**—When you select a valid country, antenna, and cable combination, the highest allowable power level is set automatically.

Select the country from the pull-down list.

Click the radio buttons next to the antenna and cable being used.

Antenna model 3CWE496 (18 dBi) is not available in some countries. In the United States, use of channels 12 and 13 in conjunction with model 3CWE496 is not allowed. The following table summarizes these and other

restrictions. Y indicates the power level that is set automatically; N indicates that a combination is not allowed.

Country	Cable Length	Antenna:											
		4dBi			8 dBi			13 dBi			18 dBi		
		Power (dBm):			Power (dBm):			Power (dBm):			Power (dBm):		
		18	13	7	18	13	7	18	13	7	18	13	7
Argentina, Brazil, Canada, Colombia, India, Malaysia, Mexico, New Zealand, Peru, Taiwan	6	Y			Y			Y			Y		
	20	Y			Y			Y			Y		
	50	Y			Y			Y			Y		
United States	6	Y			Y			Y			Y*		
	20	Y			Y			Y			Y*		
	50	Y			Y			Y			Y*		
All Other Countries (except China) <sup>†</sup>	6	N	Y		N	Y		N	N	Y	N	N	N
	20	N	Y		N	Y		N	N	Y	N	N	N
	50	Y	Y		Y			Y			N	N	N

\* Channels 12 and 13 not allowed when using 18 dBi antenna in the United States.

† Countries where transmit power is limited to 100 mW (20 dBm). In China, transmit power is limited to less than 10 mW.

## SETTING ADVANCED PERFORMANCE PROPERTIES

Under System Configuration, click *Wireless Network*. On the Wireless Network Properties page, click the link to go to advanced wireless network configuration. The Advanced Wireless Network page appears, where you can change the settings listed below. When you are finished, click *Save*.

- **Network Traffic Accelerator**—To increase performance, click *On (Enhanced performance)*. If you experience problems when equipment other than 3Com 11 Mbps Wireless LAN equipment is being used, click *Off (Wi-Fi Interoperable)*.
- **Data Preamble**—To increase performance, click *Short (Enhanced performance)*. When equipment that does not support short preamble is also being used, click *Long (Wi-Fi Interoperable)*.
- **Flow Control**—When there is a great deal of traffic on the wireless LAN, flow control can prevent bridge input buffers from overflowing, thereby increasing WLAN reliability. The bridge supports IEEE 802.3x asymmetric outgoing flow control, allowing it to pause the transmission of data frames from a switch or router that is operating in full-duplex mode and supports 10/100

auto-negotiation. To enable flow control, click *On*. To disable flow control, click *Off*.

- **Acknowledgement Delay**—This setting determines the length of time the bridge waits for an acknowledgement after transmitting packets. When the delay time has passed, the bridge resends the packets. A longer acknowledgement delay allows the bridge to associate with another wireless device over a greater distance. Set the delay to match the distance between the bridge and the wireless device with which it is associated. Click the radio button next to the appropriate distance range.
- **Client Limit**—Allows you to specify the maximum number of clients that the bridge allows to associate at the same time (from 1 to 1024). The default is 256 clients. In Access Point (Infrastructure) mode, set the Client Limit to match the number of clients that the access point can support.

To ensure network reliability, follow these guidelines for configuring the access point:

- Make sure that the access point can support more than the number of clients that you expect to use the wireless LAN.
- The client list timeout setting should be as short as possible, but no less than five minutes.
- **Data Rates**—These settings configure the data rates used for wireless transmissions. By default, the bridge selects the best data rate for the current connection.

You may not alter the settings for the 1Mbps and 2Mbps rates because these rates must always be available to transmit certain types of wireless traffic.

The 5.5 Mbps and 11 Mbps data rates may either be Required or Optional. When the data rate is set to Optional, the bridge determines if it is appropriate to use that data rate or if the signal strength requires the use of a lower data rate. If the data rate is set to Required, the bridge cannot modulate to a lower data rate, and may lose connection with clients that cannot support the higher data rate.

- **Broadcast RSSI**—This setting determines whether the device's received signal strength indication (RSSI) is broadcast. When RSSI broadcasting is enabled, you can use the device manager or the Connection Status page to monitor the signal strength. To enable RSSI broadcasting, click *On*. To disable RSSI broadcasting, click *Off*.

# SETTING UP AN AD HOC NETWORK

Operating in ad hoc mode, two bridges can establish a point-to-point association without an access point, allowing two LANs to communicate.



*To ensure correct operation, the settings on the two bridges must match exactly. To avoid the possibility of losing wireless association while you are configuring, it is recommended that you configure with a computer that is wired to the LAN. To ensure a successful association, install and configure the bridges sequentially.*

- 1 Install the first bridge.
- 2 Use the 3Com Wireless Infrastructure Device Manager to select the first bridge and launch its configuration management system.
- 3 Configure security settings.

Security settings default to No Security (Open System). Optionally, you can set shared key security as described in “40-bit Shared Key (Wi-Fi)” on page 32 or “128-bit Shared Key” on page 33. (The 128-bit Dynamic Security Link option is not available in ad hoc mode.)
- 4 Under System Configuration, click *Wireless Network*.

(Wireless Network properties are described in “Setting Wireless Network Properties” on page 24.)
- 5 In the Wireless Network page:
  - a In the Network Mode field, click *Ad-hoc (Peer-to-Peer)*.
  - b Specify the Wireless LAN Service Area.
  - c Specify the Channel Selection.

To avoid the possibility of interference from other nearby wireless devices, specify the channel to use.
  - d Click *Save* to save the wireless network settings and activate the security settings.
  - e Click the link to go to advanced wireless network configuration.
- 6 In the Advanced Wireless Network page, set options as described in “Setting Advanced Performance Properties” on page 26.
- 7 When you are finished, click *Save*.
- 8 End the browser session.
- 9 Install the second bridge and repeat the procedure. Make sure to configure settings to match the first bridge exactly. When you are finished, click *Save* and end the browser session.

# OPTIMIZING AN AD HOC INSTALLATION

You can optimize an ad hoc installation by adjusting antenna positions slightly to improve the radio signal between bridges. The following tools help you to optimize the installation:

- The device manager can display a dynamic graphical representation of the bridge's received signal strength indication (RSSI). By monitoring the RSSI while making antenna adjustments, you can ensure optimal placement.
- The configuration Connection Status page displays the bridge's basic service set identification (BSSID) and a static RSSI value that you can refresh as needed.
- The configuration Wireless Network page allows you to specify a BSSID, if necessary.

To monitor signal strength, the bridges must be set to the same BSSID and RSSI broadcasting must be enabled. In the factory default configuration, the BSSID is generated automatically and RSSI broadcasting is disabled.

To use the device manager RSSI Monitor:

- 1** Install the Wireless Infrastructure Device Manager (version 1.2.0.9 or later) from the 3Com installation CD.
- 2** Launch the device manager (*Start /Programs /3Com Wireless/Wireless Infrastructure Device Manager*).
- 3** In the device manager window, launch the first bridge configuration and configure for ad hoc mode.

Enable RSSI broadcasting as follows:

- a** In the main menu under System Configuration, click *Wireless Network*.
  - b** In the Wireless Network page, click the link to go to advanced wireless network configuration.
  - c** In the Advanced Wireless Network page, click the Broadcast RSSI On radio button, and click *Save*.
  - d** Note the bridge BSSID.  
In the main configuration menu under System Status, click *Connection Status*. The status window shows the BSSID.
- 4** Return to the device manager and repeat step 3 for the second bridge. Make sure that both bridges are using the same BSSID.

If the bridges are not using the same BSSID, specify the BSSID on both bridges as follows:

- a** In the Wireless Network page, select the following Network Mode: Ad-hoc (Peer-to-Peer) Specify.

- b** Enter the BSSID in the spaces provided.
- c** Click *Save*.
- 5** After you have enabled RSSI broadcasting on both bridges and verified that they are using the same BSSID, return to the device manager, select the first bridge, and click *Properties*.
- 6** In the device properties window, click *RSSI Monitor*.  
The RSSI Monitor window shows a graphical representation of bridge signal strength. A value of 30 indicates good strength; a value of 40 or above is very good. By adjusting the antenna position, you can improve the signal strength.

You can also monitor signal strength through a status page in the configuration as follows:

- 1** Launch the bridge configuration.
- 2** In the main configuration menu under System Status, click *Connection Status*.
- 3** The status window shows the RSSI value. Click *Refresh* to update the value each time you adjust the antenna position.

## SETTING UP AN ACCESS POINT INFRASTRUCTURE NETWORK

Operating in Access Point (Infrastructure) mode, one or more bridges can establish a point-to-multipoint association with an access point, allowing the LANs to which they are connected to communicate.



*Configure the access point before configuring the bridges.*

- 1** Use an omnidirectional antenna atop the central building. Attach the antenna to an access point inside the building. Install 3Com outdoor bridges or indoor bridges with sector-panel directional antennas for the other buildings.  
If a 3Com 11 Mbps Wireless LAN Access Point 8000 is used (with an 8 dBi omnidirectional antenna), wired LANs can be connected over distances of up to 10 kilometers (6 miles).
- 2** Use the 3Com Wireless Infrastructure Device Manager to select the first bridge and launch its configuration management system.
- 3** Configure security settings. The bridge security settings must match those on the access point.  
Security settings default to No Security (Open System). Optionally, you can set up the following types of security:

**Shared key**—See “40-bit Shared Key (Wi-Fi)” on page 32 or “128-bit Shared Key” on page 33.

**Password**—If you are using a 3Com Access Point 8000, you can set up password security as described in “128-bit Dynamic Security Link” on page 33.

- 4 Under System Configuration, click *Wireless Network*.
- 5 In the Wireless Network page:
  - a In the Network Mode field, click *Access Point (Infrastructure)*.
  - b Specify the Wireless LAN Service Area as described in “Setting Wireless Network Properties” on page 24.
  - c Click *Save*. This saves the wireless network settings and activates the security settings.
  - d Click the link to go to advanced wireless network configuration.  
In the Advanced Wireless Network page, set the Client Limit option to match the number of clients that the access point can support. (See Client Limit under “Setting Advanced Performance Properties” on page 26.) To ensure network reliability, follow these guidelines for configuring the access point:  
Make sure that the access point can support more than the number of clients that you expect to use the wireless LAN.  
The client list timeout setting should be as short as possible, but no less than five minutes.
- 6 When you are finished, click *Save*.
- 7 End the browser session.
- 8 Repeat the procedure with the other bridges. Make sure you configure bridge settings to match exactly. When you are finished, click *Save* and end the browser session.

## CHANGING SECURITY SETTINGS



*After saving security settings, you must go to the Wireless Network Properties page and click Save to activate the security settings.*

Under *System Configuration*, click *Security Settings*. The Security Settings page appears, where you can select the type of security to be used on the bridge. The bridge can be configured to support one type of security at a time. You can change the settings by clicking the radio buttons and entering values in the fields.

When you are finished, click *Save*. Then go to the Wireless Network Properties page, set the Wireless LAN Service Area, and click *Save*. Security settings take effect only after you click *Save* in the Wireless Network Properties page.

Although the bridge is allowed to associate with an access point set for a different level of encryption, data authentication is not allowed. Therefore, data cannot pass between the bridge and the access point unless their security settings match exactly.

The following sections describe the security settings. To maintain wireless association, the settings on clients and the access points they associate with (or other members of an ad hoc network) must match exactly.



*If you are configuring through a wireless association (not on the wired LAN), be sure to configure security settings before changing the WLAN service area. If you change the WLAN service area first, the bridge will lose association with one access point before it is configured to associate with another.*

## **NO SECURITY (OPEN SYSTEM)**

No encryption is used. The network communications could be intercepted by unintended recipients.

## **40-BIT SHARED KEY (WI-FI)**

This option encrypts the wireless transmissions to protect data, but still allows communication among compatible wireless LAN clients and access points from third-party manufacturers that are Wi-Fi certified.

This type of security requires you to set up encryption in one of the following ways:

- **String**—For use only with other 3Com 11 Mbps wireless LAN devices, an encryption string is a case-sensitive string of characters between 6 and 30 characters long. To enter the string, click *Enter a string to generate shared keys*. Then type any combination of letters and numbers in the space provided and click *Save*.
- **Shared keys**—Hexadecimal keys are sequences of hexadecimal digits arranged into four keys. A hexadecimal digit may be a letter from A to F or a number from 0 to 9. This type of encryption is compatible with equipment from other manufacturers that use Wi-Fi certified 40-bit encryption. To enter the keys, click *Specify shared keys and which key to use*. Then click the link to specify and select the shared keys. In the shared keys window, enter all the



keys in the provided spaces, then click a radio button in the Selected Key column to specify which key to use and click Save.

## 128-BIT SHARED KEY

This option can be used with other 3Com 11 Mbps Wireless LAN devices and with equipment from certain manufacturers that also support 128-bit shared key encryption. It provides a higher level of security than the 40-bit Shared Key (Wi-Fi) option and uses a more complicated type of encryption. This type of security requires you to set up encryption using a string or shared keys as described above in "40-bit Shared Key (Wi-Fi)" on page 32.

## 128-BIT DYNAMIC SECURITY LINK

This option can only be used with other 3Com 11 Mbps Wireless LAN devices when the bridge is set to the Access Point (Infrastructure) network mode. It is the highest level of security, requiring a user name and password to access the wireless LAN. The user name and password set up on the bridge must match those set up on the access point. Each network session creates a unique, one-time encryption code.

If you choose this type of security, you must also set up a login as described in "Setting up the Wireless Network Login" on page 33.

## SETTING UP THE WIRELESS NETWORK LOGIN



*Make sure the access point does not require Windows user authentication. The bridge cannot associate with access points that are set to Require Windows user authentication, which requires clients to enter a user name and password every time they associate with the network.*

If you configure a bridge for 128-bit Dynamic Security Link, you must also set up a login user name and password, which must match a listing in the access point user access list. In the Security Settings page, click 128-bit Dynamic Security Link. Then click the link to modify the wireless network login. In the Wireless Network Login page, enter a login name and password, and confirm the password in the spaces provided. When you are finished, click Save.

## RESETTING THE BRIDGE

If the bridge stops responding correctly, you can perform a reset, which disrupts the network association temporarily, but does not affect bridge configuration

settings that have already been saved. To reset the bridge, under Tools, click *Reset Wireless Building-to-Building Bridge*. In the next Web page, click *Reset*.

## RESTORING A BRIDGE TO FACTORY DEFAULTS

You can restore bridge settings to the defaults that were set at the factory as follows:

- 1 Under Tools, click *Restore Factory Defaults*.
- 2 Click *Restore*.

**Manual Restore (indoor bridge only)**—To restore the settings manually, insert a pointed object (such as the end of a straightened paper clip) into the reset hole on the front near the RJ-45 connector and hold for approximately 15 seconds.

If the bridge was using an IP address setting other than the default, restoring the factory defaults will change the IP address. If you want to continue configuring the bridge, do the following:

- 1 Close your browser.
- 2 Return to the 3Com Wireless Infrastructure Device Manager and click *Refresh*.
- 3 Select the device and click *Configure* to start a new configuration session.

## UPGRADING THE SYSTEM

You can download firmware and configuration management system upgrades from the 3Com Web site and install those upgrades on the bridge.

The upgrade procedure requires a Trivial File Transfer Protocol (TFTP) server. The bridge acts as a TFTP client to receive the download.

To locate an upgrade file and download it to your computer:

- 1 Log on to the 3Com Web site at <http://www.3com.com>.
- 2 Navigate to the product support page for the 3Com Wireless LAN Outdoor Bridge Solution to access the download files and instructions.
- 3 Follow the instructions to download the file into a directory on your computer.
- 4 Copy or move the file to the TFTP server upload/download directory.

To install an upgrade:

- 1 Use the 3Com Wireless Infrastructure Device Manager to select the device and launch its configuration.
- 2 Under Tools, click *Upgrade System*.
- 3 Enter the name of the upgrade file that you downloaded earlier.
- 4 Enter the IP address of the TFTP server where the upgrade file is located.
- 5 Click *Upgrade*.

The upgrade file is copied from the TFTP server to the bridge. The bridge restarts using the new upgrade.

## CHANGING THE ADMINISTRATION PASSWORD

The first time you launch the Configuration Management System on the device or after you reset a device to factory defaults, you are prompted to set an administration password. Although a password is not required, 3Com recommends that you set a password to protect against unauthorized access. After you set the password, you must enter it each time you launch the configuration for the device. A user name is not required.

Under Tools, click *Change Administration Password*. The Change Administration Password page appears, where you can change the administration password for the device. Enter the current password and new password in the spaces provided and click *Save*.

## BACKING UP A CONFIGURATION

As part of system maintenance, you should save and back up the configurations of individual bridges in case you need to reload them in the future. The backup saves all the parameters of the selected bridge in a file on your computer. The file can be used later to restore the configuration on this or another bridge.

- 1 Set the bridge parameters in the System Configuration pages.
- 2 Under Tools, click *Backup Wireless LAN Building-to-Building Bridge*.
- 3 In the next page, click *Backup Now*.
- 4 Specify a name and location for the backup, and click *OK*.

## RESTORING A CONFIGURATION

If you have stored a backup configuration on your computer, you can restore the configuration as follows:

- 1 Under Tools, click *Restore Wireless LAN Building-to-Building Bridge*.
- 2 In the next page, click *Browse* and select the backup file to upload to the bridge.
- 3 Click *Restore*.

The configuration is restored and activated on the bridge. This operation may cause the bridge to reboot.

If the bridge was using an IP address setting other than the backup, restoring the configuration will change the IP address. If you want to continue configuring the bridge, do the following:

- 1 Close your browser.
- 2 Return to the 3Com Wireless Infrastructure Device Manager and click *Refresh*.
- 3 Select the device and click *Configure* to start a new configuration session.

## VIEWING THE CLIENT LIST

Under System Status, click *Ethernet Client List*. The Ethernet Client List page appears, where you can view the following information:

- **Ethernet Clients**—Lists the client MAC addresses. The bridge supports up to 1024 specific clients. When the list reaches its limit, new clients replace inactive clients (status Not Associated).
- **# Transmitted Packets**—The number of packets that the client has transmitted.
- **# Received Packets**—The number of packets that the client has received.
- **Association Status**—One of the following:
  - Initializing*—A new client is preparing to associate.
  - Associated*—The client is active on the network.
  - Not Associated*—The client is inactive.

The client list can be up to 10 pages long. Each page lists 100 clients. You can search for a specific MAC address on the current page using your browser's Find function. To display another page, click a page number in the list at the top of the current page.

## RESETTING STATISTICS LISTINGS

In the Ethernet Client List page, click *Reset Statistics* to set the # Transmitted Packets and # Received Packets listings back to zero.

## CLEARING THE CLIENT LIST

You can clear the client list manually by clicking *Reset Clients* in the Ethernet Client List page.

The bridge erases the client list. Thereafter, clients are added to the list automatically when they next interact with the network.

## VIEWING CONNECTION STATUS

Under *System Status*, click *Connection Status* to see information about the quality of the wireless association.

Data rate values (1, 2, 5.5, or 11 Mbps) indicate the speed of data transfer. A data rate of 0 indicates no data transfer.

Signal strength values in the RSSI field range from 0 (no signal) to 100 (excellent signal quality). A signal strength of 30 is good; a value of 40 or greater is very good.

Click *Refresh* to update the information.

## VIEWING THE SYSTEM SUMMARY

Under *System Status*, click *System Summary* to see information about the bridge. You can go to the configuration pages of items that can be configured by clicking their names in the list.

Click *Refresh* to update the information.

## INTEROPERATING WITH THIRD-PARTY EQUIPMENT

Because 3Com Wireless LAN equipment complies with IEEE 802.11b standards, it can interoperate with third-party equipment that also complies with the standards. However, some third party equipment may not support 3Com enhanced performance features. You may need to turn off the Network Traffic Accelerator and set the Data Preamble to long to support this equipment on the network.


# 4

## TROUBLESHOOTING

### DIAGNOSING PROBLEMS

If you have difficulty with a 3Com Wireless LAN building-to-building bridge, try the solutions in the following table.

Symptom	Solutions
Two bridges fail to communicate in ad hoc mode.	<ul style="list-style-type: none"><li>■ Adjust the positions of the antennas to improve reception.</li><li>■ To ensure correct operation in ad hoc mode, the settings on the two bridges must match exactly. Launch the bridge configuration management system and make sure that the Wireless LAN Service Area, channel selections, Data Preamble setting, and security settings are the same on both bridges.</li></ul>
The bridge fails to associate with an access point.	<ul style="list-style-type: none"><li>■ Adjust the position of the antenna to improve reception.</li><li>■ Launch the bridge configuration and make sure the security settings, advanced performance settings, and access point privacy mode settings on the bridge match those on the access point.</li><li>■ If the access point is from another manufacturer, try turning the Network Traffic Accelerator off and setting the Data Preamble to long.</li><li>■ Using 128-bit Dynamic Security Link encryption, the bridge cannot associate with access points that are set to <i>Require Windows user authentication</i>, which requires clients to enter a user name and password every time they associate with the network. Make sure the access point does not require Windows user authentication.</li><li>■ If the bridge is using an 18 dBi antenna, the FCC restricts the use of channels 12 and 13 to very reduced rates in the United States. Access points set to automatically select the best channel may occasionally select channel 12 or 13. To avoid interruptions, it is recommended that you set the access point to use a specific channel.</li></ul>
The 128-bit Dynamic Security Link setting does not work in ad hoc mode.	128-bit Dynamic Security Link is not supported in ad hoc mode. Use the 40-bit or 128-bit Shared Keys settings instead.

Symptom	Solutions
A bridge set for 128-bit Shared Key encryption seems to communicate with an access point set for 40-bit Shared Key encryption or open system.	Although the bridge is allowed to associate with an access point set for a different level of encryption, data authentication is not allowed. Therefore, data cannot pass between the bridge and the access point unless their settings match exactly.
The Wireless Network Tree does not appear in the 3Com Wireless Infrastructure Device Manager window.	Verify that you are using the correct network adapter. In the device manager window, click <i>Choose NIC</i> . Select the network adapter for the network you want to scan, and click <i>OK</i> .
After upgrading the system, custom configuration settings are lost.	Under some circumstances, upgrading the firmware and the configuration management system forces a return to configuration defaults. In this case, launch the bridge configuration and reconfigure the settings.
After enabling or disabling the Secure Web Server Connection option, some configuration changes are lost.	Changing the Secure Web Server Connection option causes the bridge to reset, which disrupts the network association temporarily, but does not affect bridge configuration settings that have already been saved. To ensure that changes to security settings are retained, either change this option before changing security settings, or click <i>Save</i> in the Wireless Network page after changing security settings and before changing this option.
After you change the IP address, after you restore a backup configuration, or after you reset the bridge to factory defaults, the Configuration Management System stops responding and you cannot continue configuring the bridge.	<p>If you change the IP address and click <i>Save</i>, you cannot continue to configure the device using the old IP address. Similarly, after you restore a backup configuration or reset the bridge to factory defaults, the IP address setting may be changed.</p> <p>To recover from this situation and continue configuring the bridge:</p> <ol style="list-style-type: none"> <li>1 Close your browser.</li> <li>2 Return to the 3Com Wireless Infrastructure Device Manager and click <i>Refresh</i>.</li> <li>3 Select the device and click <i>Configure</i> to start a new configuration session.</li> </ol>
You are running Windows NT. After you connect the bridge, your computer cannot obtain a valid IP address.	The bridge configuration settings may not be compatible with the network. If they are not, and your Windows NT computer is set up to obtain its IP address from a DHCP server, the bridge is unable to associate with the network to obtain the IP address. To work around this problem, set a static IP address on your computer. Then set the bridge configuration to match the network. When the bridge is able to associate, reset your computer to obtain its IP address from the DHCP server. If the bridge should also obtain its IP settings from the DHCP server, make sure this is configured properly on the IP Network page and applied just before ending the session.
A bridge fails to respond	Disconnect the power for 10 seconds and then reconnect.
	<b>CAUTION:</b> DO NOT ATTEMPT TO DISCONNECT the power under extreme weather conditions, especially during electrical storms.

## DISCONNECTING THE BRIDGE



**CAUTION:** *Disconnecting the bridge ends the network association. To avoid possible data loss, exit all networking applications on connected devices before you disconnect the bridge.*

- If you are using the 3Com power supply, unplug it from the power source. Then unplug the Ethernet cable from the power supply and the second Ethernet cable from the bridge.
- If the bridge is connected directly to a power-over-Ethernet device, unplug the bridge Ethernet cable from the device.
- DO NOT ATTEMPT TO DISCONNECT under extreme weather conditions, especially during electrical storms.

## UNINSTALLING SOFTWARE AND DOCUMENTATION

If you want to uninstall the 3Com 11 Mbps Wireless LAN software and documentation, you can either use the standard operating system procedure for removing programs or use the following shortcut procedure:

- 1 From the Windows Start menu, select *Start/Programs/3Com Wireless/Wireless Building-to-Building Bridge/Uninstall*.
- 2 When prompted to confirm, click *OK*.

## UPGRADING BRIDGE FIRMWARE

Firmware is the software that is installed on the bridge at the factory. Some problems can be solved by installing a new version of the firmware (*upgrading firmware*).

For details on how to download a firmware update from the 3Com customer support Web site and install it on your bridge, see "Upgrading the System" on page 34.





# TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the most recent information, access the 3Com Corporation World Wide Web site at <http://www.3com.com/>.

## ONLINE TECHNICAL SERVICES

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

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### World Wide Web Site

To access the latest networking information on the 3Com Corporation World Wide Web site enter this URL into your Internet browser:

<http://www.3com.com/>

This service provides access to online support information such as technical documentation and software library, and support options that range from technical education to maintenance and professional services.

### 3Com Knowledgebase Web Services

This interactive tool contains technical product information compiled by 3Com expert technical engineers around the globe. Located on the World Wide Web at <http://knowledgebase.3com.com>, this service gives all 3Com customers and partners complimentary, round-the-clock access to technical information on most 3Com products.

### 3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

Hostname: `ftp.3com.com`

Username: `anonymous`

Password: `<your Internet e-mail address>`

A user name and password are not necessary when you are using a Web browser such as Netscape Navigator and Internet Explorer.

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## SUPPORT FROM YOUR NETWORK SUPPLIER

If you require additional assistance, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

## SUPPORT FROM 3COM

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

The following list of worldwide technical telephone support number is correct at the time of publication. Refer to the 3Com Web site for updated information.

<b>Country</b>	<b>Telephone Number</b>
<b>Asia, Pacific Rim</b>	
Australia	1 800 678 515
Hong Kong	800 933 486
India	+61 2 9424 5179 or 000800 650 1111
Indonesia	001 803 61009
Japan	00531 616 439 or 03 5977 7991

<b>Country</b>	<b>Telephone Number</b>
Malaysia	1800 801 777
New Zealand	0800 446 398
Pakistan	+61 2 9937 5083
Philippines	1235 61 266 2602 or +61 2 9937 5076
P.R. of China	10800 61 00137 or 021 6350 1590 or 00800 0638 3266
Singapore	800 6161 463
S. Korea	00798 611 2230 or 02 3455 6455
Taiwan, R.O.C.	00801 611 261
Thailand	001 800 611 2000
Or, send a description of the problem by email to: <a href="mailto:apr_technical_support@3com.com">apr_technical_support@3com.com</a>	
<b>Europe, Middle East and Africa</b>	
From anywhere in these regions:	<a href="http://emea.3com.com/support/supportnumbers.html">http://emea.3com.com/support/supportnumbers.html</a>
<b>Latin America</b>	
Brazil	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>
Mexico	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>
Puerto Rico	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>
Central and South America	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>
<b>North America</b>	
United States and Canada	1 800 876 3266

## RETURNING PRODUCTS FOR REPAIR

Before you send a product directly to 3Com for repair, you must first obtain an authorization number. Products sent to 3Com without authorization numbers will be returned to the sender unopened, at the sender's expense. To obtain an authorization number, call or fax:

<b>Country</b>	<b>Contact Information</b>	
Asia, Pacific Rim	+ 65 543 6500 Phone	+ 65 543 6348 Fax
Europe, South Africa, and Middle East	<a href="http://emea.3com.com/gls">http://emea.3com.com/gls</a> For e-mail Support: <a href="http://emea.3com.com/support/email.html">http://emea.3com.com/support/email.html</a>	
Central and South America	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>	
Argentina	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>	
Bolivia	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>	
Brazil	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>	
Caribbean	525 201 0004	
Chile	562 240 6200	
Colombia	525 201 0004	
Ecuador	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>	
Mexico	<a href="http://www.3com.com/support/en_US/repair/lat.html">http://www.3com.com/support/en_US/repair/lat.html</a>	
Paraguay	525 201 0004	
Peru	511 241 1691	
Uruguay	525 201 0004	
Venezuela	525 201 0004	
From the following countries, you may call the toll-free numbers; select option 2 and then option 2:		
Austria	0800 297468	
Belgium	0800 71429	
Denmark	800 17309	
Finland	0800 113153	
France	0800 917959	
Germany	0800 1821502	
Hungary	06800 12813	
Ireland	1800553117	
Israel	1800 9453794	
Italy	800 879 489	
Netherlands	0800 0227788	
Norway	800 11376	

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<b>Country</b>	<b>Contact Information</b>
Poland	00800 3111206
Portugal	0800 831416
South Africa	0800 995014
Spain	900 983125
Sweden	020 795482
Switzerland	0800 55 3072
U.K.	0800 966197
U.S.A. and Canada	1 800 876 3266

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## REGULATORY COMPLIANCE INFORMATION

### 3Com Wireless LAN Outdoor Bridge Solution

#### FCC Radio-Frequency Exposure Notice

This device generates and radiates radio-frequency energy. In order to comply with FCC radio-frequency radiation exposure guidelines for an uncontrolled environment, this equipment has to be installed and operated while maintaining a minimum body to antenna distance of 2 meters.

This product does not contain any user serviceable components. Any unauthorized product changes or modifications will invalidate 3Com's warranty and all applicable regulatory certifications and approvals. This product must be installed by a professional technician/installer.

#### FCC Part 15 Notice (Applicable to Use Within the USA)

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

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

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

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

#### Manufacturer's Declaration of Conformity

**3Com Corporation**  
5500 Great America Parkway  
P.O. Box 58145  
Santa Clara, CA 95054-8145  
(408) 326-5000

Declares that the product:

Date: 13 December 2002  
Brand Name: 3Com Corporation  
Model Number: WL-306B  
Equipment Type: Wireless LAN Building-to-Building Bridge

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.



## Industry Canada Notice (Applicable to Use Within Canada)

This device complies with Canadian RSS-210.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's web site [www.hc-sc.gc.ca/rpb](http://www.hc-sc.gc.ca/rpb).

## Avis de Conformité à la Réglementation d'Industrie Canada

Pour empêcher toute interférence aux services faisant l'objet d'une licence, cet appareil doit être utilisé à l'intérieur seulement et devrait être placé loin des fenêtres afin de fournir un écran de blindage maximal.

L'installateur du présent matériel radio doit s'assurer que l'antenne est située ou pointée de manière à ce que cette dernière n'émette pas de champs radioélectriques supérieurs aux limites spécifiées par Santé Canada pour le grand public; consulter le Code de sécurité 6, disponible sur le site Web de Santé Canada, à l'adresse suivante: [www.hc-sc.gc.ca/rpb](http://www.hc-sc.gc.ca/rpb).

## Industry Canada (IC) Emissions Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

## Avis de Conformité à la Réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

## European Community - CE Notice

Marking by the symbol:



indicates compliance with the essential requirements of Directive 73/23/EC and the essential requirements of articles 3.1(b), 3.2 and 3.3 of Directive 1999/5/EC. Such marking is indicative that this equipment meets or exceeds the following technical standards:

- EN 300 328-2 - Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques
- EN 301 489-17 - Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2.4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment.
- EN 60950 - Safety of information technology equipment, including electrical business equipment.

Marking by the symbol:



indicates that usage restrictions apply.

In France, this product must be configured to operate on a legal channel. Channels 10 - 13 are allowed. User documentation should be consulted to ensure that this product is used in accordance with local spectrum restrictions.

## Additional Country Restrictions

- In Israel, this product must be configured to operate on a legal channel. Channels 5 - 7 are allowed.
- In Jordan, this product must be configured to operate on a legal channel. Channels 10 - 13 are allowed.

User documentation should be consulted to ensure that this product is used in accordance with local spectrum restrictions.

## Safety Compliance Notice

This device has been tested and certified according to the following safety standards and is intended for use only in Information Technology Equipment which has been tested and certified to these or other equivalent standards:

- UL Standard 60950, 3rd Edition / CSA C22.2 No. 60950-00
- IEC 60950
- EN 60950

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# INDEX

---

## Numbers

- 128-bit Dynamic Security Link 33
- 128-bit Shared Key 33
- 3Com Knowledgebase Web Services 41
- 3Com Wireless Infrastructure Device Manager 18
- 40-bit Shared Key (Wi-Fi) security 32

---

## A

- access point network 9, 30
- access point privacy mode 25
- acknowledgement delay 27
- ad hoc network 9, 28
- adapter, choosing 19
- administration password, changing 35
- administration tool 18
  - requirements 11
- advanced performance properties 26
- antenna
  - aligning 12
  - channel and power restrictions 12
  - configuring 25, 27
  - grounding 11
  - lightning arrestor 12
  - polarization 12
  - selection 25
- association with access points using different encryption 32
- authentication, data 32

---

## B

- backing up configurations 35
- basic service set identification (BSSID) 24
- bridge
  - changing properties 21
  - installation 10
  - maintaining configurations 35
  - password 35
  - resetting 22, 33, 39
  - restoring factory defaults 34
  - user name 35

- broadcast ESSID 25
- broadcast RSSI 27

---

## C

- changing passwords, administration 35
- channel and power restrictions 12
- channel selection 25
- choosing a NIC 19
- clearing the client list 37
- client list 37
- configuration 18
  - backing up 35
  - maintenance for bridges 35
  - restoring 36
  - saving changes 21
- Configuration Management System 19, 20
- Configure button 19
- configuring
  - antenna distance 27
  - antenna selection 25
  - country selection 25
  - through a wireless association 32
- connecting power 10
- connection status, viewing 37
- country
  - configuring 25
  - selection 25

---

## D

- data authentication 32
- data preamble 26
- data rate 27
- delay, acknowledgement 27
- device
  - configuring 19, 20
  - location 22
  - name 22
- device manager 18
  - launching 18
- Dynamic Security Link 33



---

## E

encryption  
  settings 31  
  string 32  
encryption, association with different settings 32  
ESSID 24

---

## F

filtering  
  port 23  
  protocol 23  
firmware upgrade 34  
flow control 26

---

## G

grounding antennas 11  
guidelines, security 32

---

## H

help file location 22  
help file path 22  
hexadecimal keys 32

---

## I

installation 10  
  bridge 10  
  connecting to a wired network 15  
  firmware 34  
  power 10  
  requirements 10  
  software utilities 16  
interoperating with third-party equipment 37  
IP address 22  
  refreshing after changing 19  
  specifying 22, 23

---

## K

keys 32

---

## L

launching the device manager 18  
lightning arrestor 12  
locating devices 18, 19  
login user name and password 33

---

---

## M

MAC address, use in locating devices 18, 19

---

## N

network  
  access point 9, 30  
  ad hoc 9, 28  
  infrastructure 24  
  mode 24  
  privacy mode 25  
  traffic accelerator 26  
network supplier support 42  
NIC, choosing 19  
No Security 32

---

## O

online technical services 41  
open system 32  
operating mode  
  access point 9, 30  
  ad hoc 9, 28

---

## P

password, changing 35  
performance properties, advanced 26  
point-to-multipoint 7  
  association 30  
  topology 8  
point-to-point 7  
  association 28  
  topology 7  
polarization 12  
port filtering 23  
power and channel restrictions 12  
power requirements 10  
Pre-IP Configuration Wizard 19, 20  
privacy mode 25  
problem solving 38  
Properties button 19  
protocol filtering 23

---

## R

radio channel settings 25  
Refresh button 19  
resetting a bridge 22, 33, 39  
restoring a configuration 36

---

restoring settings to factory defaults 34  
restrictions, channel and power 12  
returning products for repair 43  
RSSI broadcasting 27

---

## S

safety information 13  
saving configuration changes 21  
secure web server connection 22, 39  
security 31

- 128-bit Dynamic Security Link 33
- 128-bit Shared Key 33
- 40-bit Shared Key (Wi-Fi) 32
- guidelines 32
- no security 32
- saving settings 21

settings, radio channel 25  
shared keys 32  
signal strength, broadcasting 27  
software utilities 16

- installing 16

solving problems 38  
system summary, viewing 37

---

## T

technical support

- 3Com Knowledgebase Web Services 41
- network suppliers 42
- product repair 43

temperature 11  
thermal performance 11  
third-party interoperability 37  
traffic accelerator 26  
troubleshooting 38

- bridge firmware 34

---

## U

upgrading bridge firmware 34  
user name 35

---

## W

Web browser configuration 18  
web server, secure connection 22, 39  
wireless LAN service area 24  
Wireless Network Login 33  
wireless network tree 18  
World Wide Web (WWW) 41

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