



## Special Configurations

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This chapter describes how to set up the bridge in special network roles. You can set up a bridge as a rugged access point for use in harsh environments, as a repeater bridge to extend the range of a wireless network, and as a backup unit in areas where you need extra reliability.

This chapter contains the following sections:

- [Setting up a Rugged Access Point, page 12-2](#)
- [Setting Up a Repeater Bridge, page 12-5](#)
- [Using Hot Standby Mode, page 12-7](#)

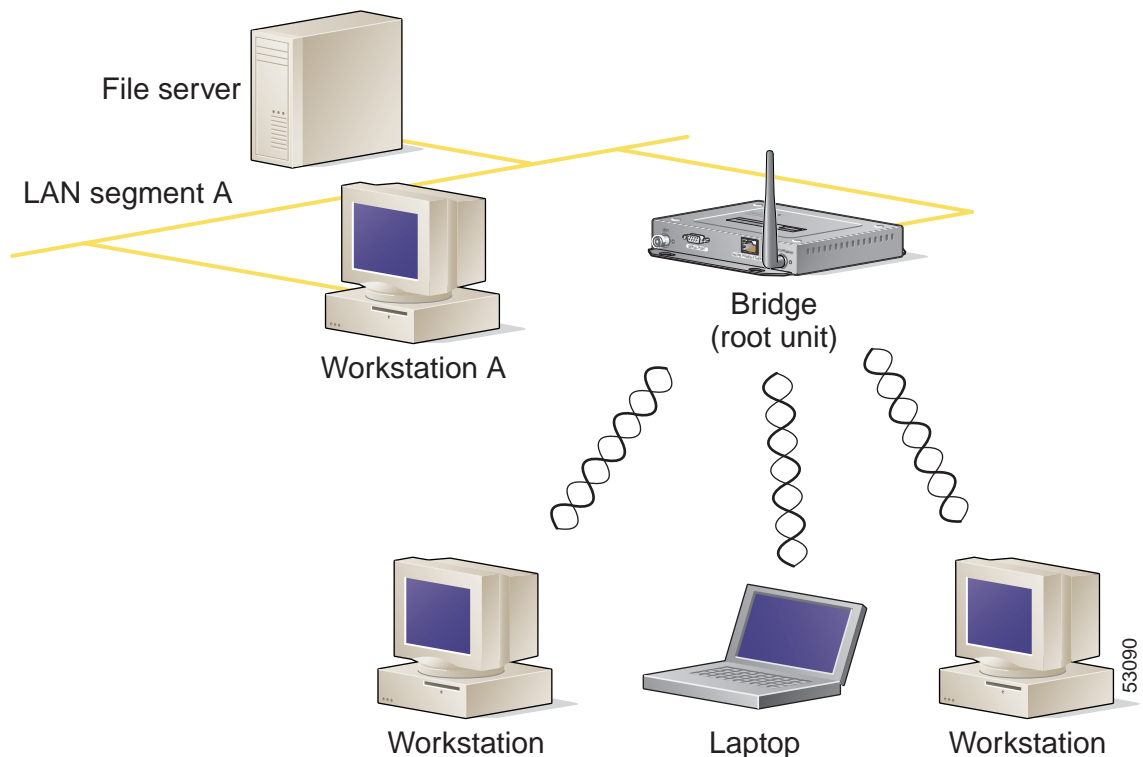
# Setting up a Rugged Access Point

The bridge contains industrial-grade components, so you can install it in surroundings that would be too harsh for a device with a plastic housing. The bridge must be protected from water, but it will operate in extreme temperatures.

## Root Access Point

Figure 12-1 shows a bridge functioning as a rugged access point attached to a wired LAN.

Figure 12-1 Bridge as Rugged Access Point



Follow these steps to set up the bridge as a rugged access point:

- Step 1** Use the *Quick Start Guide: Cisco Aironet Multifunction Bridges* and the information in this manual to set up a bridge as a root unit on the wired LAN.
- Step 2** On the Express Setup page in the bridge's management system, select **Root Access Point** from the Role in radio network pull-down menu.
- Step 3** Also on the Express Setup page, enter an SSID that client devices can use to associate to the rugged access point. You might want to use the same SSID used by other access points on the same LAN segment as the rugged access point.

- Step 4** Use the Security Setup page to enter and enable a WEP key that client devices can use to associate to the rugged access point. As with the SSID, you might want to use the same security settings used by other access points on the same LAN segment.
- Step 5** Use an antenna, such as an omni-directional antenna or a patch antenna, that covers the area containing the client devices that will associate with the rugged access point.

## Repeater Access Point

Follow these steps to set up the bridge as a rugged repeater access point.



**Note** Non-Cisco client devices might have difficulty communicating with repeater access points.

- Step 1** Use the *Quick Start Guide: Cisco Aironet Multifunction Bridges* and the information in this manual to set up a bridge as a root unit on the wired LAN.
- Step 2** Write down the MAC address of the root access point or bridge the repeater will communicate with. The MAC address appears on the label on the bottom of the access point.
- Step 3** The repeater access point will need to duplicate some of the root access point's settings. If the root access point is completely configured, browse to the root access point and write down the following settings so you can refer to them when you set up the repeater access point:
- SSID (found on the Express Setup page)
  - Default IP Subnet Mask (also on the Express Setup page)



**Note** You can also rely on the DHCP server to assign a default IP subnet mask.

- Default Gateway (also on the Express Setup page)



**Note** You can also rely on the DHCP server to assign a default gateway.

- Data rates (found on the AP Radio Hardware page)
- WEP settings (found on the AP Radio Data Encryption page)
- Authentication Types (found on the AP Radio Data Encryption page)

If the root access point settings have not been changed from the factory defaults, you don't need to write them down. If you reconfigure the root access point, however, you must enter the same settings on the repeater access point.

- Step 4** Place the repeater access point within radio range of the root access point.
- Step 5** Plug an Ethernet cable into the repeater's Ethernet port. Plug the other end of the Ethernet cable into the side of the power injector labelled *To AP*.



**Note** The repeater access point will not be connected to the wired LAN, so do not run Ethernet cable from the power injector to a switch.

**Step 6** Plug the power injector's power cable into an electrical outlet.



**Note**

[Step 7](#), [Step 8](#), and [Step 9](#) describe opening the access point management system using a terminal emulator, but you can use a crossover cable instead. Use a crossover cable to connect the access point's Ethernet port to the Ethernet connection on a computer and browse to the access point's IP address. If you use a crossover cable to open the management system, skip to [Step 10](#).

**Step 7** Attach a nine-pin, male-to-female, straight-through serial cable to the repeater's serial port. Plug the other end of the serial cable into the COM 1 or COM 2 port on a computer.

**Step 8** Use a terminal emulator to open the repeater's management system. Assign these port settings to the terminal emulator: 9600 baud, 8 data bits, No parity, 1 stop bit, and Xon/Xoff flow control.

**Step 9** When the terminal emulator connects with the access point, press = to display the access point's Summary Status page. If the repeater access point has never been configured before, the Express Setup page appears instead of the Summary Status page.

**Step 10** On the Express Setup page, enter the same SSID that is set on the root access point or bridge.



**Note**

[Step 11](#) and [Step 12](#) describe assigning a static IP address, subnet mask, and gateway to the repeater. However, you can rely on your DHCP server to assign these settings if you do not need them to remain fixed. If the repeater will use the DHCP server, skip to [Step 13](#).

**Step 11** On the Express Setup page, enter a fixed IP address for the repeater access point in the Default IP address field.

**Step 12** Also on the Express Setup page, enter the same settings in the Default IP Subnet Mask and Default Gateway fields that are on the root access point.

**Step 13** On the Boot Server Setup page, select **none** for the Configuration Server Protocol. This setting will maintain a fixed IP address for the repeater access point.

If the root access point configuration has not been changed from the factory defaults, skip to [Step 17](#).

**Step 14** On the AP Radio Hardware page, enter the same settings for Data Rates that are on the root access point.

**Step 15** On the AP Radio Data Encryption page, enter the same WEP key settings that are on the root access point.

**Step 16** Also on the AP Radio Data Encryption page, select the same Authentication Types that are on the root access point.

**Step 17** On the AP Radio Advanced page, enter the root access point's MAC address in the Specified access point 1 entry field.

**Step 18** On the Express Setup page, select **Repeater Access Point** as the Role in Radio Network. The access point reboots when you apply this setting.

**Step 19** The status LED on the root access point should be steady green, indicating that at least one client device is associated with it. The status LED on the repeater access point is steady green when it is associated with the root access point and has client devices associated with it. The repeater's status LED is steady for 7/8 of a second and off for 1/8 of a second when it is associated with the root access point but has no client devices associated with it. The repeater access point should also appear as associated with the root access point in the root access point's Association Table.

**Note**

You can set up repeater access points to authenticate to the network and receive dynamic WEP keys. See the *Cisco Aironet Access Point Software Configuration Guide* for instructions on setting up access points as LEAP clients.

## Setting Up a Repeater Bridge

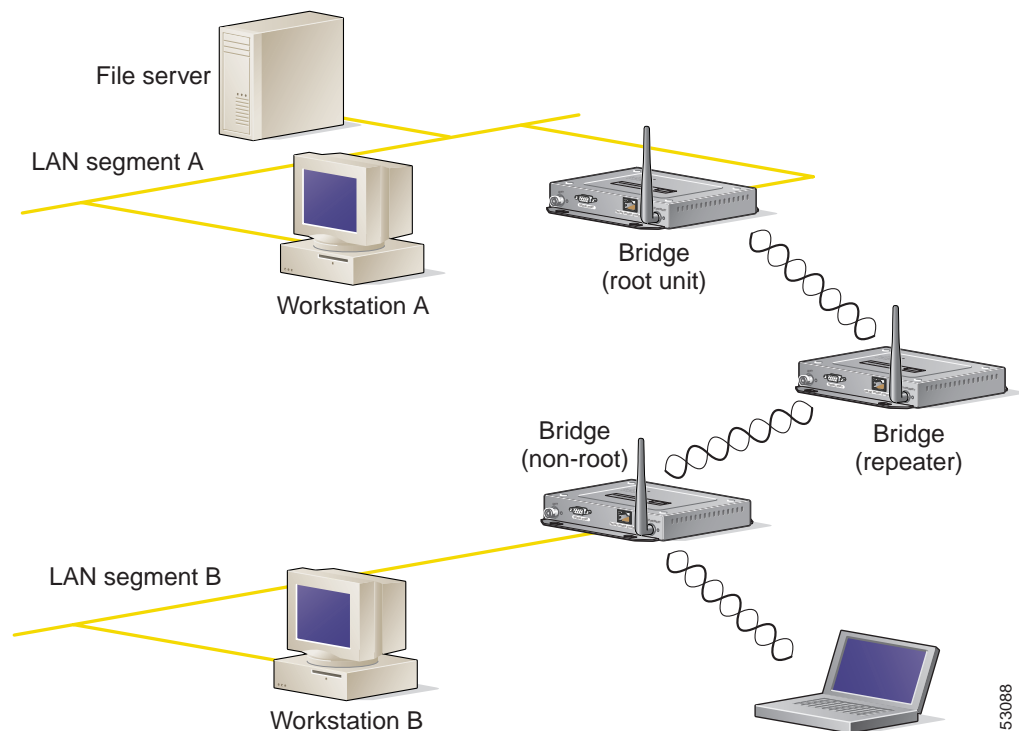
A repeater bridge is placed between two bridges to extend the range of your infrastructure or to overcome an obstacle that blocks radio communication. A repeater bridge can be connected to a wired LAN segment but does not need to be. [Figure 12-2](#) shows a bridge acting as a repeater not connected to a wired LAN segment.

You can set up a chain of repeater bridges, but throughput across the repeater chain will be quite low. Because each repeater must receive and then re-transmit each packet on the same channel, throughput is cut in half for each repeater you add to the chain. For example, throughput is halved for data sent from workstation B to workstation A in [Figure 12-2](#).

**Note**

You can set up your non-root bridges to authenticate to the network and receive dynamic WEP keys. See the [“Setting Up a Non-Root Bridge as a LEAP Client”](#) section on page 8-19 for instructions on setting up bridges as LEAP clients.

**Figure 12-2 Bridge as Repeater**



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Follow these steps to set up a repeater bridge:

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- Step 1** Use the *Quick Start Guide: Cisco Aironet Multifunction Bridges* and the information in this manual to set up a bridge as a root unit on the wired LAN.
- Step 2** Write down the root-unit bridge's MAC address. The MAC address appears on the label on the bottom of the bridge.
- Step 3** The repeater bridge must duplicate some of the root bridge's settings. If the root bridge has been completely configured, browse to the root bridge and write down the following settings so you can refer to them when you set up the repeater bridge:

- SSID (found on the Express Setup page)
- Default IP Subnet Mask (also on the Express Setup page)




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**Note** You can also rely on the DHCP server to assign a default IP subnet mask. However, Cisco recommends that you assign static IP addresses to all bridges.

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- Default Gateway (also on the Express Setup page)




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**Note** You can also rely on the DHCP server to assign a default gateway.

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- Data rates (found on the Root Radio Hardware page)
- WEP settings (found on the Root Radio Data Encryption page)
- Authentication Types (found on the Root Radio Data Encryption page)

If the root bridge settings have not been changed from the factory defaults, you don't need to write them down. If you reconfigure the root bridge, however, you must enter the same settings on the repeater bridge.

- Step 4** Place the repeater bridge within radio range of the root bridge.
- Step 5** Plug an Ethernet cable into the bridge's Ethernet port. Plug the other end of the Ethernet cable into the side of the power injector labelled *To AP*.
- Step 6** Plug the power injector's power cable into an electrical outlet.




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**Note** [Step 7](#), [Step 8](#), and [Step 9](#) describe opening the bridge management system using a terminal emulator, but you can use a crossover cable instead. Use a crossover cable to connect the bridge's Ethernet port to the Ethernet connection on a computer and browse to the bridge's IP address. If you use a crossover cable to open the management system, skip to [Step 10](#).

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- Step 7** Attach a nine-pin, male-to-female, straight-through serial cable to the bridge's serial port. Plug the other end of the serial cable into the COM 1 or COM 2 port on a computer.
- Step 8** Use a terminal emulator to open the bridge's management system. Assign these port settings to the terminal emulator: 9600 baud, 8 data bits, No parity, 1 stop bit, and Xon/Xoff flow control.
- Step 9** When the terminal emulator connects with the bridge, press = to display the bridge's Summary Status page. If the repeater bridge has never been configured before, the Express Setup page will appear instead of the Summary Status page.
- Step 10** On the Express Setup page, enter the same SSID that is set on the root bridge.

**Step 11** On the Express Setup page, enter a fixed IP address for the repeater bridge in the Default IP address field.



**Note** Cisco recommends assigning a static IP address to your bridge to simplify network management and to prevent delays in receiving an address through DHCP. To assign a static IP address to your bridge, select **None** from the Configuration Server Protocol pull-down menu and enter the IP address for the bridge in the Default IP Address field.

**Step 12** Also on the Express Setup page, enter the same settings in the Default IP Subnet Mask and Default Gateway fields that are on the root bridge.

**Step 13** If the root bridge configuration has not been changed from the factory defaults, skip to [Step 17](#). If the root bridge configuration has been changed, continue to [Step 14](#).

**Step 14** On the Root Radio Hardware page, enter the same settings for Data Rates that are on the root bridge.

**Step 15** On the Root Radio Data Encryption page, enter the same WEP key settings that are on the root bridge.

**Step 16** Also on the Root Radio Data Encryption page, select the same Authentication Types that are on the root bridge.

**Step 17** On the Root Radio Advanced page, enter the root bridge's MAC address in the Specified Access Point 1 entry field.

**Step 18** On the Express Setup page, select **Non-Root Bridge w/Clients** as the Role in Radio Network. The bridge reboots when you apply this setting.

**Step 19** The status LED on the root bridge should be steady green, indicating that at least one client device is associated with it. The status LED on the repeater bridge is steady green when it is associated with the root bridge and has client devices associated with it. The repeater's status LED is steady for 7/8 of a second and off for 1/8 of a second when it is associated with the root bridge but has no client devices associated with it. The repeater bridge should also appear as associated with the root bridge in the root bridge's Association Table.

## Using Hot Standby Mode



**Note** The Hot Standby mode is supported only on a bridge configured as an access point. It is not supported on a root bridge.

Hot Standby mode designates an access point as a backup for a root access point. The standby access point is placed near the access point it monitors, and with exception of the IP address, it is configured exactly the same as the monitored access point. The standby access point associates to the monitored access point as a client and queries the monitored access point regularly through both the Ethernet and the radio. If the monitored access point fails to respond, the standby access point takes the monitored access point's place in the network.

Except for the IP address, the standby bridge's settings should be identical to the settings on the monitored unit. You use the Hot Standby page to set up the standby bridge. [Figure 12-3](#) shows the Hot Standby page.

**Note**

You may need to set the path cost for the standby bridge's radio higher than the path cost for the Ethernet port so that the Spanning Tree Protocol blocks the radio port instead of the Ethernet port. Even though the radio port is blocked, the hot standby feature still maintains association with the root, which is required for standby monitoring.

**Note**

A hot standby bridge will not take over for a non-root bridge.

Figure 12-3 Hot Standby Page

Map Help Uptime: 03:19:04

Service Set ID (SSID)

MAC Address For the Monitored AP:

Polling Frequency:  (Seconds)

Timeout For Each Polling:  (Seconds)

Current Status: Hot Standby is not running.

Start Hot Standby Mode STOP Hot Standby Mode

Apply OK Cancel Restore Defaults

**Note**

The Current State field varies depending on the hot standby status. It can display *Hot Standby is not running*, *Hot Standby is initializing*, or *Hot Standby is monitoring and protecting*. The change appears after you refresh the screen.

Follow this link path to reach the Hot Standby page:

- On the Summary Status page, click **Setup**.
- On the Setup page, click **Cisco Services** under Services.
- On the Cisco Services Setup page, click **Hot Standby Management**.

**Note**

Wireless client devices associated to the standby access point lose their connections to the hot standby access point when hot standby is started.

**Note**

If you set up two standby systems on the same subnet or if the default IP address is 10.0.0.2, you must manually set the default radio IP addresses to avoid an IP address conflict. When a hot standby unit takes over, it uses its default IP address (10.0.0.2), which is the default for all access points. Therefore, if two hot standby access points are online at the same time (for example, as the result of a power failure), a duplicate IP address exists and a conflict occurs.

Follow these steps to enable Hot Standby mode on a rugged access point:

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- Step 1** On the standby access point, duplicate the settings on the monitored access point.
- Critical settings include:
- SSID (on the Express Setup page)
  - Default IP Subnet Mask (also on the Express Setup page)
  - Default Gateway (also on the Express Setup page)
  - Data rates (on the AP Radio Hardware page)
  - WEP settings (on the AP Radio Data Encryption page)
  - Authentication Types (on the AP Radio Data Encryption page)
- Step 2** On the standby access point, browse to the AP Radio Identification page:
- a. On the Summary Status page, click **Setup**.
  - b. On the Setup page, click **Identification** in the AP Radio row under Network Ports.
- Step 3** Select **no** for the Adopt Primary Port Identity option, and click **Apply**. The access point reboots.
- After the access point reboots, the radio has its own identity: the radio IP and MAC addresses are different from the Ethernet addresses. The default IP address for the radio is 10.0.0.2.
- In two situations, you might need to change the radio IP address from its default setting:
- You must change the radio IP address if you need to use 10.0.0.2 for the Ethernet IP address. The Ethernet and radio ports on the standby access point must have different IP addresses.
- You must change the radio IP address if you need to browse to the standby access point through its radio port. If you need to browse to the access point through the radio port, passing the port an IP address on the same subnet as the Ethernet IP address.
- Step 4** After the access point reboots, browse to the Hot Standby page.
- Step 5** Enter the monitored access point's SSID in the Service Set ID entry field.
- Step 6** Enter the monitored access point's MAC address in the MAC Address For the Monitored AP entry field.
- Step 7** Enter the number of seconds between each query the standby access point sends to the monitored access point.
- Step 8** Enter the number of seconds the standby access point should wait for a response from the monitored access point before it assumes that the monitored access point has malfunctioned.
- Step 9** Click **Start Hot Standby Mode**. The standby access point becomes a client device associated to the monitored access point.
- Step 10** Click the browser's refresh button to verify that the Current State line on the Hot Standby Setup page states that Hot Standby is initialized.



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**Note** If the monitored access point malfunctions and the standby access point takes its place, repeat the hot standby setup on the standby access point when you repair or replace the monitored access point. The standby access point does not revert to standby mode automatically.

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**Note**

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If you need to browse to the standby access point from a workstation that is on a different subnet than the standby access point, set the IP address on the standby radio interface to a subnet that is compatible with the workstation's IP address. Use the Internal or Module Radio ID page to enter a new IP address for the standby radio.

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