



Lab 6.5.5.1 Configure Layer 3 Site-to-Site Wireless Link—OPTIONAL Challenge Lab

Estimated Time: 45 minutes

Number of Team Members: Students will work in teams of two.

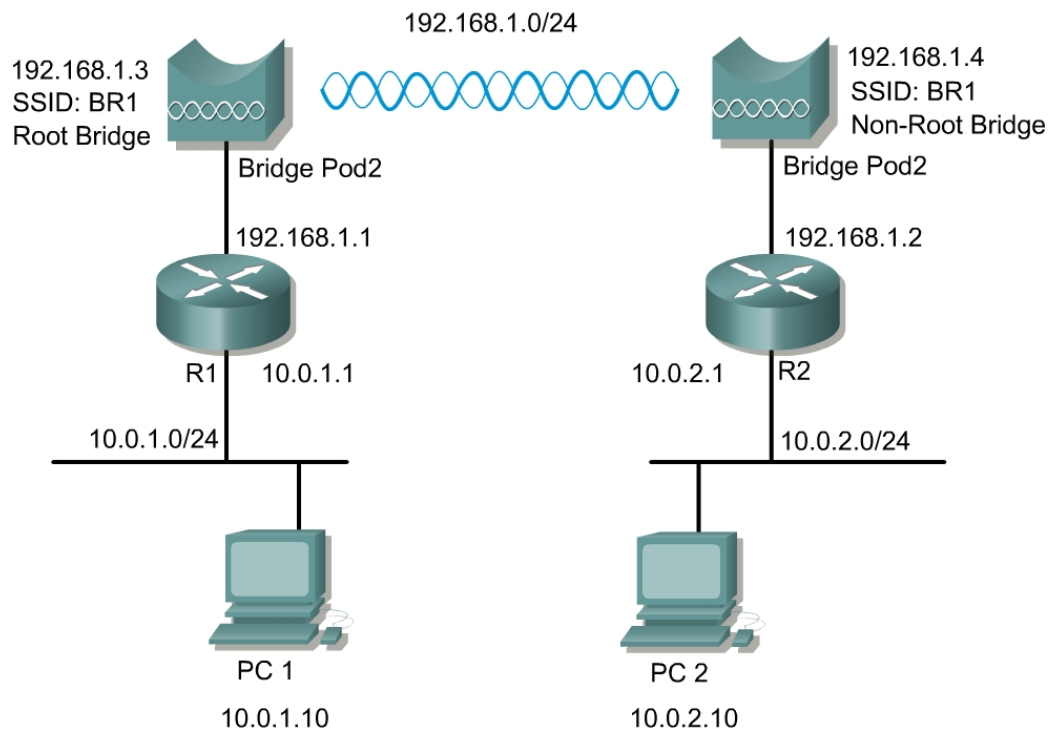
Objective

Configure a site-to-site bridge network separated by a Layer 3 device. Test the speed of the wireless bridge link.

Scenario

A remote location which is several miles away requires connectivity to the existing wired network. The connection can be bridged wirelessly with two BR350s. In large networks, it is necessary to provide Layer 2 broadcast control using routers.

Topology



Preparation

The instructor or students must cable and configure the perimeter routers in addition to the wired LAN. The routers Ethernet interfaces must be configured and enabled. Static routing should be configured on the routers. Ensure that the devices are configured according to the topology. The bridge devices should be configured as follows:

<u>Device Name</u>	<u>Label</u>	<u>SSID</u>	<u>Address</u>
BPod1	BR1	BR1	192.168.1.3/24
BPod2	BR2	BR1	192.168.1.4/24

Tools and Resources

Each team will require the following:

- Two wired LAN segments that will be bridged together
- Two Cisco BR350s with 2.4dBi dipole antenna(s)
- Two dual Ethernet routers
- Two switches or hubs(optional)

Step 1 Connect and reset both bridges

Connect a nine-pin, male-to-female, straight-through serial cable to the COM port on a computer and to the RS-232 serial port on the bridge. (This cable ships with the bridge)

- Open a terminal emulator.
- Enter these settings for the connection:
 - Bits per second (baud rate): 9600
 - Data bits: 8
 - Parity: none
 - Stop bits: 1
 - Flow control: Xon/Xoff
- Press = to display the home page of the bridge. If the bridge has not been configured before, the Express Setup page appears as the home page. (GO TO STEP 3)
- If the bridge is already configured, the Summary Status page appears as the home page. When Summary Status screen appears, type **:resetall**, and press **Enter**.

```
Enter "YES" to confirm Resetting All parameters to factory defaults:
YES
00:02:12 (FATAL): Rebooting System due to Resetting Factory Defaults
*** Restarting System in 5 seconds...
```

- Type **yes**, and press **Enter** to confirm the command.
- Power cycle the bridge by removing the power.

Step 2 Connect to the BR350s using express setup

- Plug a second RJ-45 Ethernet cable into the power injector end labeled TO NETWORK. Plug the other end of the Ethernet cable into the Ethernet port on a switch or hub. Then connect PC1 to the switch. A crossover cable can be used to connect directly from the inline power injector to PC1/PC2.
- Configure PC1 to 10.0.0.2/24
- Open a web browser and enter the default bridge address. <http://10.0.0.1> and press Enter.
- Either of the following pages will appear:
 - The **Summary Status** Page, also known as the **Home** Page
 - The **Express Setup** Page

BR350-5aa7d6 Summary Status

Cisco 350 Series Bridge 12.03T

Home Map Network Associations **Setup** Logs Help

Uptime: 00:13:00

Current Associations

Clients: 0 of 0	Repeaters: 0 of 0	Bridges: 0 of 1	APs: 0
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Recent Events

Time	Severity	Description
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Network Ports

Device	Status	Mb/s	IP Addr.	MAC Addr.
Ethernet	Up	100.0	10.0.0.1	0040965aa7d6
Root Radio	Up	11.0	10.0.0.1	0040965aa7d6

Diagnostics

BR350-5aa7d6 Express Setup

Cisco 350 Series Bridge 12.03T

Home Map Help

Uptime: 00:14:22

System Name: BR350-5aa7d6

MAC Address: 00:40:96:5a:a7:d6

Configuration Server Protocol: DHCP

Default IP Address: 10.0.0.1

Default IP Subnet Mask: 255.255.255.0

Default Gateway: 255.255.255.255

Root Radio:

Service Set ID (SSID): tsunami [more...](#)

Role in Radio Network: Root Bridge

Optimize Radio Network For: ☒ Throughput ☐ Range ☐ Custom

Ensure Compatibility With: ☐ 2Mb/sec Clients

[Security Setup](#)


SNMP Admin. Community:

Apply OK Cancel Restore Defaults

- e. If the Express Setup Page does not appear, from the Summary Status Page click on the **Setup** hyperlink. This will bring up the Setup Page.

BR350-5aa7d6 Setup

Cisco 350 Series Bridge 12.03T



Uptime: 00:17:25

[Home](#) | [Map](#) | [Network](#) | [Associations](#) | [Setup](#) | [Logs](#) | [Help](#)

Express Setup

Associations			
Display Defaults	Spanning Tree	Port Assignments	Advanced
Address Filters	Protocol Filters	VLAN	Service Sets

Event Log		
Display Defaults	Event Handling	Notifications

Services			
Console/Telnet	Boot Server	Routing	Name Server
Time Server	FTP	Web Server	SNMP
Cisco Services	Security	Accounting	Proxy Mobile IP

Network Ports				<u>Diagnostics</u>
Ethernet	Identification	Hardware	Filters	Advanced
Root Radio	Identification	Hardware	Filters	Advanced

- f. Now click on the **Express Setup** link. This will now bring up the Express Setup Page.

Step 3 Configure the bridge settings

BR350-5aa7d6 **Express Setup**

CISCO SYSTEMS

Cisco 350 Series Bridge 12.03T

Home Map Help

Uptime: 00:23:24

System Name:

BPod1

MAC Address:

00:40:96:5a:a7:d6

Configuration Server Protocol:

None

Default IP Address:

10.0.1.1

Default IP Subnet Mask:

255.255.255.0

Default Gateway:

10.0.1.254

Root Radio:

Service Set ID (SSID):

BR1

more...

Role in Radio Network:

Root Bridge

Optimize Radio Network For:

☒ Throughput ☐ Range ☐ Custom

Ensure Compatibility With:

☐ 2Mb/sec Clients

Security Setup

SNMP Admin. Community:

Apply

OK

Cancel

Restore Defaults

Configure the following settings:

Parameter	BPod1	BPod2
• System Name:	BPod1	BPod2
• Configuration Server Protocol:	None	None
• Default IP address:	192.168.1.3	192.168.1.4
• Default Gateway:	192.168.1.1	192.168.1.2
• Service Set ID:	BR1	BR1
• Role in Radio Network:	Root Bridge	Non-Root Bridge w/o Clients

- Click Apply. The connection will drop.
- What roles can the bridge serve in the network?

Step 4 Cable and configure the routers and PCs

Using dual Ethernet routers, such as an 806, 2514, or equivalent.

Configure both routers:

```
hostname Router1
int fa0/0
 ip address 192.168.1.1
255.255.255.0
 description outside
 no shut
!
int fa0/1
 ip address 10.0.1.1 255.255.255.0
 description inside
 no shut
!
router eigrp 1
 network 10.0.0.0
 network 192.168.1.0
 no auto-summary
!
line vty 0 4
 password cisco
 login
```

```
hostname Router2
int fa0/0
 ip address 192.168.1.2
255.255.255.0
 description outside
 no shut
!
int fa0/1
 ip address 10.0.2.1 255.255.255.0
 description inside
 no shut
!
router eigrp 1
 network 10.0.0.0
 network 192.168.1.0
 no auto-summary
!
line vty 0 4
 password cisco
 login
```

Configure the PCs:


- PC1 with an IP address of 10.0.1.10/24.
 - PC2 with an IP address of 10.0.2.10/24
- a. Reconnect to the using the browser. Enter 10.0.P.1 and connect.
 - b. Verify the settings.
 1. What other routing method can be used instead of EIGRP?

2. Can static routes be used? If so, what is the advantage/disadvantage?

Step 5 Advanced Radio settings for the non-root bridge

BPod1 Setup

Cisco 350 Series Bridge 12.03T



Uptime: 00:39:27

[Home](#) [Map](#) [Network](#) [Associations](#) [Setup](#) [Logs](#) [Help](#)

Express Setup

Associations

Display Defaults	Spanning Tree	Port Assignments	Advanced
Address Filters	Protocol Filters	VLAN	Service Sets

Event Log

Display Defaults	Event Handling	Notifications
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Services

Console/Telnet	Boot Server	Routing	Name Server
Time Server	FTP	Web Server	SNMP
Cisco Services	Security	Accounting	Proxy Mobile IP

Network Ports [Diagnostics](#)

Ethernet	Identification	Hardware	Filters	Advanced
Root Radio	Identification	Hardware	Filters	Advanced

- From the **Setup** Page, Click on the Root Radio>Advanced link to go to the **Radio Advanced** page of the Non-Root Bridge.

BPod1 Bridge Radio Advanced

Cisco 350 Series Bridge 12.03T



Uptime: 00:44:08

[Map](#) [Help](#)

Requested Status:	Up
Current Status:	Up
Packet Forwarding:	Enabled
Forwarding State:	Blocking
Default Multicast Address Filter:	Allowed
Maximum Multicast Packets/Second:	0
Radio Cell Role:	Client/Non-Root
SSID for use by Infrastructure Stations (such as Repeaters):	0
Disallow Infrastructure Stations on any other SSID:	<input type="radio"/> yes <input checked="" type="radio"/> no
Use Aironet Extensions:	<input checked="" type="radio"/> yes <input type="radio"/> no
Classify Workgroup Bridges as Network Infrastructure:	<input checked="" type="radio"/> yes <input type="radio"/> no
Require use of Internal Radio Firmware: 5.20U	<input checked="" type="radio"/> yes <input type="radio"/> no
Ethernet Encapsulation Transform:	RFC1042
Bridge Spacing (km):	0

Quality of Service Setup

If VLANs are *not* enabled, set the following three parameters on this page. If VLANs *are* enabled, the following three parameters are set independently for each enabled VLAN through [VLAN Setup](#).

Enhanced MIC verification for WEP:	None
Temporal Key Integrity Protocol:	None
Broadcast WEP Key rotation interval (sec):	0 (0=off)

To configure 802.11 Authentication, EAP, Unicast Address Filters, and the Maximum Number of Associations for this radio's Primary SSID (the default SSID), please use the link below.

[Advanced Primary SSID Setup](#) [more...](#)

Preferred Access Point 1:	00:00:00:00:00:00
Preferred Access Point 2:	00:00:00:00:00:00
Preferred Access Point 3:	00:00:00:00:00:00
Preferred Access Point 4:	00:00:00:00:00:00
Radio Modulation:	Standard
Radio Preamble:	Short
Non-Root Mobility:	Stationary

[Apply](#) [OK](#) [Cancel](#) [Restore Defaults](#)

- b. Enter the MAC address of the Root Bridge into the **Preferred AP 1:** field. This can be found on the bottom of the Root Bridge or from the Root Bridge **Home** Page.

BPod1 Summary Status CISCO SYSTEMS

Cisco 350 Series Bridge 12.03T

Home Map Network Associations Setup Logs Help Uptime: 00:46:31

Current Associations				
Clients: 0 of 0	Repeaters: 0 of 0	Bridges: 0 of 1	APs: 0	

Recent Events		
Time	Severity	Description

Network Ports			Diagnostics	
Device	Status	Mb/s	IP Addr.	MAC Addr.
Ethernet	Up	100.0	10.0.1.1	0040965aa7d6
Root Radio	Up	11.0	10.0.1.1	0040965aa7d6

- c. Click the **Apply** button to apply the settings.

BPod1 Association Table CISCO SYSTEMS

Network Diagnostics VLAN Service Sets

Home Map Network Associations Setup Logs Help Uptime: 00:47:47

☒ Client ☒ Repeater ☒ Bridge ☒ AP ☐ Infra. Host ☐ Multicast ☐ Entire Network

Press to Change Settings: Apply Save as Default Restore Current Defaults

Association Table					additional display filters	
Device	Name	IP Addr./Name	MAC Addr.	VLAN	State	Parent
350 Series Bridge	BPod1	10.0.1.1	0040965aa7d6			

- d. Go to the **Associations** page of the Root Bridge.
- Is the Non-Root Bridge in the Association table?

Step 7 Test the connection

Verify client PCs are configured with the appropriate IP address. The only wireless devices on this topology will be the two wireless multi-function bridges used for the point-to-point connection.

- Once the wireless bridge link is configured properly, ping from PC1 to Router 1 inside Ethernet port. Then ping to Router1 outside port. If successful, ping from PC1 to BPod2. Ping from PC1 to Router2 outside port, followed by a ping to Router2 inside port. Finally, Ping from PC1 to PC2.
- Were these successful? _____
- Test layer 7 connectivity by browsing to BPod2 from PC1.
- Configure FTP or Web services on PC1 and PC2. Transfer a files from PC1 to PC2 and vice versa. Calculate the download performance across the wireless link.
- What was the download speed in Mbps? _____
- How was this calculated? _____
- What is the speed limitation? _____