Configuring Site-to-Site Wireless Link using Enterprise Security

Estimated Time: 45 minutes

Number of Team Members: Students will work in teams of 2.

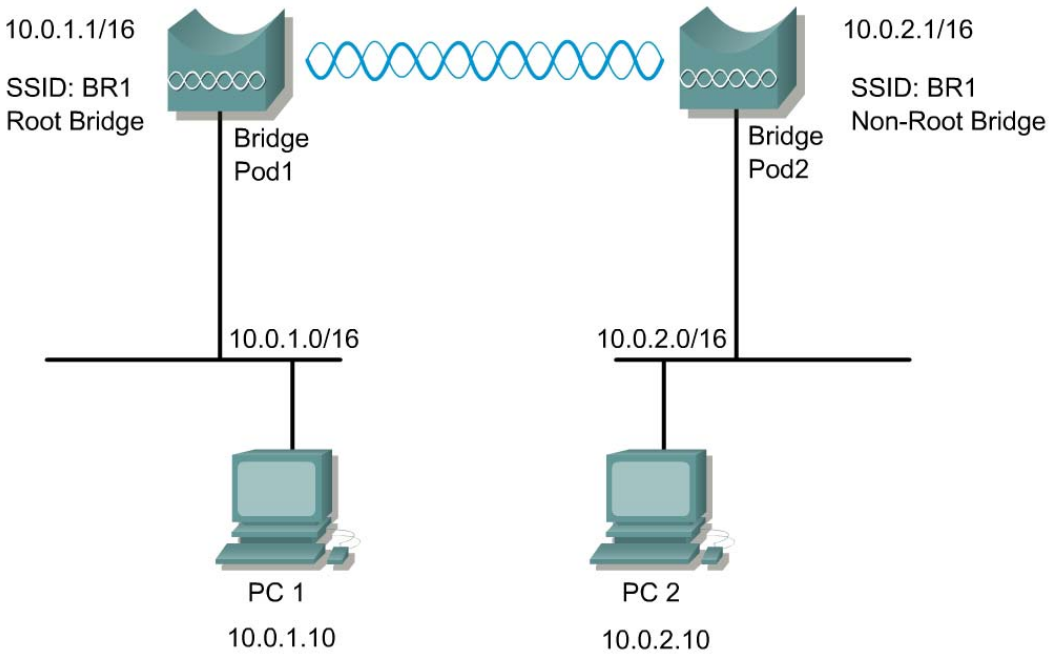
Objective

Configure a site-to-site bridged network using enterprise security features.

Scenario

A remote location located several miles away requires connectivity to the existing wired network. The connection can be bridged wirelessly with the use of two BR1310s. The company's security policy mandated a minimum of 128 bit WEP security for all wireless connections.

Topology



Preparation

In this lab, the following will be configured.

Device Name	SSID	BVI Address
BPod1	BR1	10.0.1.1/16
BPod2	BR1	10.0.2.1/16

Tools and Resources

Each team will require the following:

- Two wired LAN segments that will be bridged together
- Two Cisco BR1310
- PC with FTP server loaded and a file to transfer in the root directory of the FTP server

Step 1 Cable and power the bridge

a. For each bridge, attach 2 rubber duck antennas to the RP-TNC connectors.

b. Connect the power cable to the Power Injector and to a wall receptacle.

Step 2 Connect to the bridge and clear existing configurations

Connect a PC to the bridge power injector's serial port using a DB-9 to RJ-45 serial cable.

a. Open a terminal emulator.

b. Enter these settings for the connection:

- Bits per second (baud rate): 9600
- Data bits: 8
- Parity: none
- Stop bits: 1
- Flow control: none

c. Press **Return** to get started

d. Enter privileged mode. ***Cisco*** is the default password.

```
PodP>enable
Password:
PodP#
```

e. Turn off notification logging to avoid interruptions as you enter commands.

```
PodP#configure terminal
PodP(config)#logging console 4
```

f. Erase the configuration with the following commands:

```
PodP#erase startup-config
Erasing the nvram filesystem will remove all files! Continue?
[confirm]      (press Enter)
[OK]
Erase of nvram: complete
PodP# reload
```



```
System configuration has been modified. Save? [yes/no]:  N
Proceed with reload? [confirm]    (press Enter)
```

g. After the system reboots, repeat the step to turn off notification logging.

h. Assign an IP address and address mask to the BVI.

```
PodP(config)#interface bvi1
PodP(config-if)#ip address 10.0.P.1 255.255.0.0
```

i. Configure the PCs.

- PC1 with an IP address of 10.0.1.10/16
- PC2 with an IP address of 10.0.2.10/16

Step 3 Connect to the BR1310 through a web browser

a. Connect an RJ-45 Ethernet cable to the Ethernet port on the bridge Power Injector. Connect the other end of the Ethernet cable to the wired network.

b. Open a web browser, enter the bridge BVI address http://10.0.P.1, and press **Enter**.

Step 4 Configure the bridge settings

Configure the following settings from the **Express Set-Up** page:

	Parameter	BPod1	BPod2
a.	System Name:	***BPod1***	***BPod2***
b.	Configuration Server Protocol:	***Static IP***	***Static IP***
c.	IP address:	***10.0.1.1***	***10.0.2.1***
d.	Subnet Mask:	***255.255.0.0***	***255.255.0.0***
e.	Default Gateway:	***10.0.1.254***	***10.0.1.254***
f.	Role in Radio Network:	***Root***	***Non-Root***

g. Click **Apply** to save these changes.

h. Navigate to the **Express Security** page and configure the SSID: ***BR1***

i. Verify the settings on both bridges. Navigate to the **Association** page to confirm that the bridges have associated.

Step 5 Test the connection

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

a. Once the wireless bridge link is configured properly, ping from PC1 to BPod2. Then ping from PC1 to PC2.

b. If these pings are not successful, troubleshoot as necessary.

c. Test layer 7 connectivity by browsing from PC1 to BPod2.

d. Configure FTP or Web services on PC1 and PC2. Transfer a file from PC1 to PC2 and vice versa. Observe the download performance across the wireless link.

e. What was the download speed in Mbps?

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Step 6 Configure static WEP on both bridges

Follow these steps to set up WEP keys and enable WEP:

a. From the **Security: Encryption Manager** page, click the radio button next to **WEP Encryption** and select **Mandatory** from the drop down list.

b. Select the radio button for **Encryption Key 1** in the Transmit Key column. Make sure that drop down list has **128-bit** selected for Key Size.

c. Click in the Encryption Key field and enter a WEP key. For a 128-bit encryption, the key will need to be 26 hexadecimal characters in length. Only the numbers 0-9 and the letters A-F can be used.

d. Record the key below.

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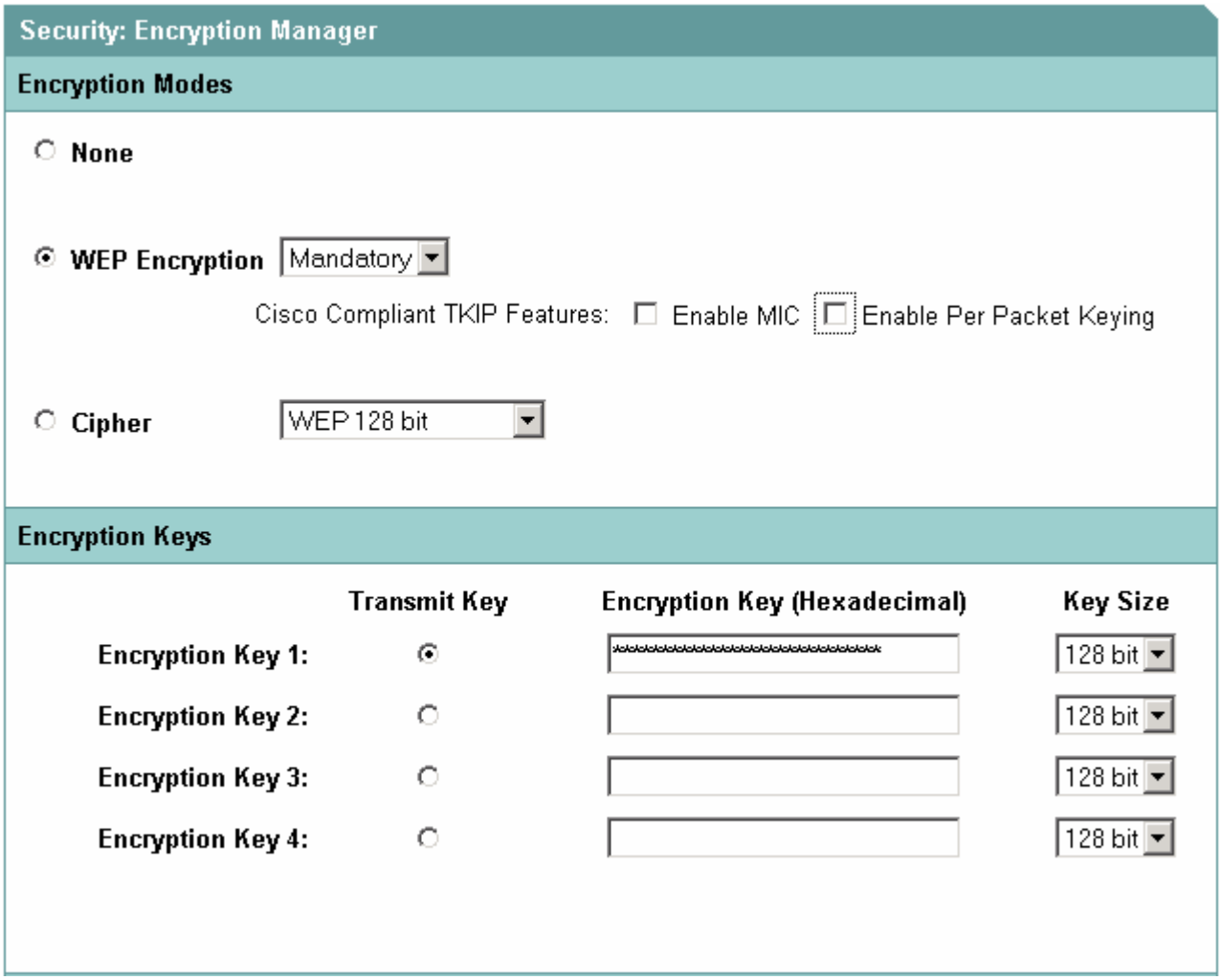
e. Click **Apply** to save the WEP Key.

f. Repeat the same steps on the other bridge.



Step 7 Retest the connection

From either bridge, navigate to the **Association** page to view the status of the wireless link. If the bridges do not associate, troubleshoot the static WEP configuration.

a. Once the wireless bridge link is functional, ping from PC1 to PC2 to test end-to-end connectivity.

b. Repeat the FTP download process from PC1 to PC2. Observe the download performance across the wireless link.

c. What was the download speed in Mbps? Did WEP have an impact on performance?

Step 8 Enable enterprise security

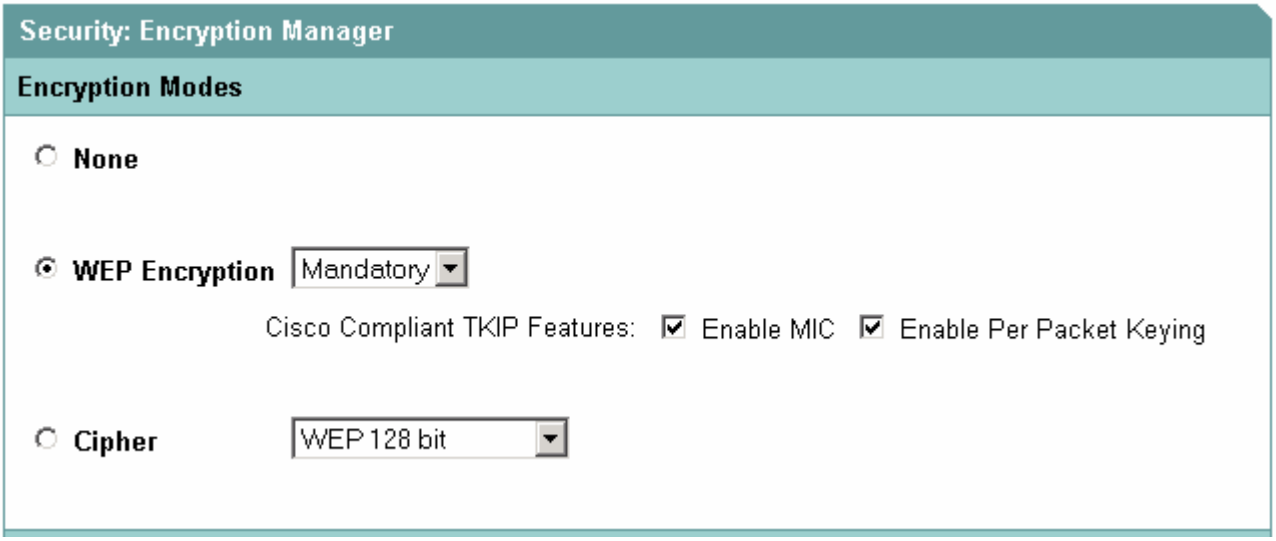
Once WEP is configured correctly, additional measures should be configured to secure the wireless link. Follow these steps to set up Per Packet Keying and MIC.

a. From the **Encryption Manager** page, select the check boxes for the Cisco Compliant TKIP features.

b. Click the **Apply** button. The wireless link will be lost with the other bridge.

c. Configure the other bridge with the same security setting.

d. The link should be re-established.



d. What attack does TKIP prevent?

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e. View the Security Summary via the web browser for an overview of the security settings.

Security Summary

Administrators

Username	Read-Only	Read-Write
Cisco	✓	

Radio0-802.11G SSIDs

SSID	VLAN	Open	Shared	Network EAP
BR1	none	no addition		

Radio0-802.11G Encryption Settings

Encryption Mode	WEP		Cipher					Key Rotation
	MIC	PPK	TKIP	WEP40bit	WEP128bit	CKIP	CMIC	
WEP-Mandatory	✓	✓						