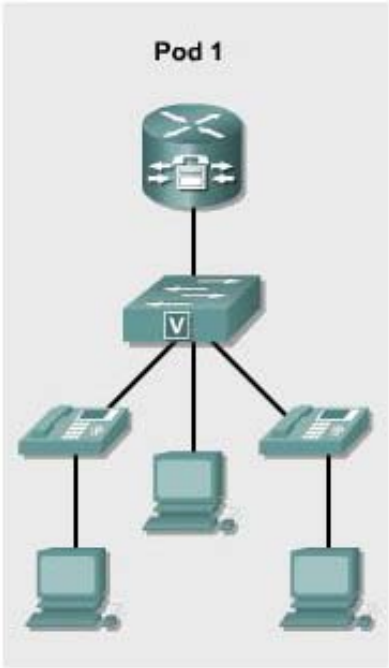
Lab 2.1.1a Basic Setup for the CME Router with Switch Module



Objectives

- Configure a Cisco router in preparation for CallManager Express (CME)
- Configure a switch in preparation for CME

Equipment Requirements

- Cisco CallManager Express (CME) capable router with switch module
- Workstation with an Ethernet 10/100 NIC installed
- Two Cisco IP phones

In this lab, the ACME.com Company has decided to deploy CallManager Express in the enterprise. First, the router portion (including the switch module) of CallManager Express must be configured. The routers and switch module should be configured using the information found in IP Telephony Table 1.

Step 1 Assign a Pod Number

a. Ask the instructor to assign a pod number to the lab group.

What pod number was the group assigned? _____

Step 2 Erasing Configuration and VLANs from the Router

a. The router with a four port switch module stores VLAN information in Flash memory. To ensure the router does not have a previous configuration, connect a console cable to the router and power on the router.

b. Erase the switch VLAN database and startup-configuration file by using the **delete flash:vlan.dat**, **erase startup-config**, and **reload** commands.

```
Router# delete flash:vlan.dat
Router# erase startup-config
Router# reload
```

Step 3 Basic CME Router Configuration

a. On the router, enter privilege mode and then configuration mode.

b. Change the hostname of the router. Use the command **hostname CMERouter*X***, where ***X*** is the pod number assigned to the group. Throughout the rest of the lab, use IP Telephony Table 1 parameters based on the pod number assigned.

```
Router(config)# hostname CMERouterX
```

c. Set the enable secret password to **cisco**. (Do not deviate from this password.)

d. Use the command **no ip domain-lookup** to disable name resolution since there is no DNS server in the classroom lab.

```
CMERouterX(config)# no ip domain-lookup
```

e. Note that router commands are IOS and model specific. Examples given in this lab are the most common configurations seen. However, the command may vary slightly. For example, on a 1760 router the VTY lines are 0 through 15 instead of 0 through 4. Configure all the router VTY lines with parameters similar to the following:

```
CMERouterX(config)# line vty 0 4
CMERouterX(config-line)# password cisco
CMERouterX(config-line)# login
CMERouterX(config-line)# logging synchronous
```

f. Configure the console port parameters.

```
CMERouterX(config)# line console 0
CMERouterX(config-line)# password cisco
CMERouterX(config-line)# login
CMERouterX(config-line)# logging synchronous
```


g. Create two VLANs—one for the voice VLAN and one for the data VLAN. VLAN 1, the management VLAN, is already created. Note that the ***X*** shown in the command is the pod number.

```
CMERouterX# vlan database
CMERouterX(vlan)# vlan X0 name Data state active
CMERouterX(vlan)# vlan X5 name Voice state active
```

h. Go into the configuration mode for the management VLAN by entering global configuration mode and typing the command **interface vlan 1**. The management VLAN is the VLAN used to remotely manage network devices such as routers and switches.

```
CMERouterX(config)# interface vlan 1
```

i. Configure the management VLAN interface with an IP address appropriate for the management VLAN. From the interface configuration mode, enter the IP address for the management VLAN based on the information found in IP Telephony Table 1. Use the command **ip address 10.X.0.1 255.255.255.0** command (where ***X*** is the pod number).

```
CMERouterX(config-if)# ip address 10.X.0.1 255.255.255.0
```

j. Go into the configuration mode for the data VLAN by entering global configuration mode and entering the command **interface vlan X0** (where ***X*** is the pod number). For example, if the group was assigned to Pod 1, the command would be as follows: **interface vlan 10**

```
CMERouterX(config)# interface vlan X0
```

k. Configure the data VLAN interface with an appropriate IP address. From the interface configuration mode, enter the IP address for the data VLAN based on the information found in IP Telephony Table 1. Use the command **ip address 10.X0.0.1 255.255.255.0** command (where ***X*** is the pod number).

```
CMERouterX(config-if)# ip address 10.X0.0.1 255.255.255.0
```

m. If a host was configured on the same data VLAN, what would be the host default gateway IP address? _____

n. Go into the configuration mode for the voice VLAN by entering the global configuration mode and entering the command **interface vlan X5** (where ***X*** is the pod number).

```
CMERouterX(config)# interface vlan X5
```

o. Configure the voice VLAN with the appropriate IP address. Enter the IP address for the voice VLAN based on the information found in IP Telephony Table 1. Use the **ip address 10.X5.0.1 255.255.255.0** command (where ***X*** is the pod number).

```
CMERouterX(config-if)# ip address 10.X5.0.1 255.255.255.0
```

p. Bring EACH of the created VLAN interfaces to a useable condition.

```
CMERouterX(config)# interface vlan x
CMERouterX(config-if)# no shutdown
```

q. Configure the EIGRP routing protocol by using the **router eigrp 100** command to start an EIGRP process with an autonomous system number of 100. Then enter the command **network 10.0.0.0**, which enables and advertises EIGRP updates on all 10.0.0.0-configured interfaces.

```
CMERouterX(config)# router eigrp 100
CMERouterX (config-router)# network 10.0.0.0
```


Step 4 Configure the Router Switch Ports

a. Verify the slot into which the router switch four port module inserts by (1) viewing the router and (2) using the **show diag** command. Look for the words 4 Port FE Switch.

```
CMERouterX# show diag
```

b. Based on the previous step, into what slot does the switch module insert? _____

c. Use the **show ip interface brief** command to verify the slot and the format used for the interface. For example in a 2811 ISR, the four ports list as FastEthernet 0/0/0, 0/0/1, 0/0/2, and 0/0/3.

d. Write the format in which the four ports list. _____

e. Ports 0 and 1 of the switch module will be used to connect the IP phones. These ports must be configured as trunk modes, must have the trunking protocol configured, must identify the native VLAN, and must identify the voice VLAN.

Note that the *slot*/*port-adapter*/*port* parameter that is typed depends on the router slot into which the four port module inserts.

The **native** keyword defines this VLAN as the one that is not tagged with VLAN information when a frame (from VLAN ***X***0) crosses the trunk between the IP phone and the switch. This allows the PC that connects to the IP phone to be on a different subnet than the IP phone and still receive an IP address from a DHCP server. If a warning message appears, ignore it. If this command does not work, the proper router is not being used.

IMPORTANT: Note that the following commands must be done on both port 0 and port 1. An alternative to the **interface fastethernet** command is **interface range fastethernet *slot/port-adapter/port*** command.

```
CMERouterX(config)# interface fastethernet slot/port-adapter/port
CMERouterX(config-if)# switchport trunk encapsulation dot1q
CMERouterX(config-if)# switchport trunk native vlan X0 (where X is
the pod number)
CMERouterX(config-if)# switchport mode trunk
CMERouterX(config-if)# switchport voice vlan X5 (where X is the pod
number)
CMERouterX(config-if)# no shutdown
```

f. What is the purpose of the **dot1q** parameter used in the previous step? _____

_____

Step 5 Verify VLAN Configuration

a. From privileged mode on the router, issue the **show ip interface brief** command and verify that VLAN1, X0, and X5 (where X is the pod number) have IP addresses and that their status is up and up.

```
CMERouterX# show ip interface brief
```

b. Are all three VLAN interfaces up and up and have the proper IP address? If not, troubleshoot as necessary. _____

If the interfaces are not there, do not have an IP address or the correct IP address, or if their status is not up and up, do not proceed until appropriate troubleshooting has been performed.

c. From privileged mode verify the port is properly configured as a trunk port by using the **show interfaces *slot/port-adapter/port* switchport** command (where *interface-id* is the switch port used to connect to the router).

```
CMERouterX# show interfaces fastethernet slot/port-adapter/port
      switchport
```

d. What is the status of the switch port (shown as *switchport* in the command output)?
_____

e. What is the status of the Administrative Mode? _____

f. What is the status of the Operational Mode? _____

g. What is the Operational Trunking Encapsulation that has been configured? _____

h. What VLANs are trunked by default? _____

i. The **show interfaces trunk** command can be used to verify trunk operations.

```
CMERouterX# show interfaces trunk
```

j. Based on the command output, what port(s) have trunking enabled?
_____

k. Based on the command output, what VLAN is the native VLAN? (**Note:** The native VLAN is the VLAN that does not tag a frame from this VLAN as it traverses the trunk with VLAN information. It is also the VLAN that continues to cross the link between the router and the switch if the trunk ever fails for any reason.) _____

l. Based on the command output, what VLANs are allowed on the trunk? _____

m. Based on the command output, what VLANs are participating in spanning tree and are in the forwarding state? _____

n. Connect a Cisco IP phone using a straight-through cable to the switch port 0. The port on the bottom of the IP phone is labeled 10/100. Note that the IP phone will not work until CallManager Express has been configured.

o. Using a second straight-through cable, connect the second phone to switch port 1 on the router.

Step 6 Save the Router Configuration

a. Save the router configuration by typing the following command:

```
CMERouterX# copy running-config startup-config
```

Note: Save the router configuration to a text file as well. These configurations will be required in future labs.

