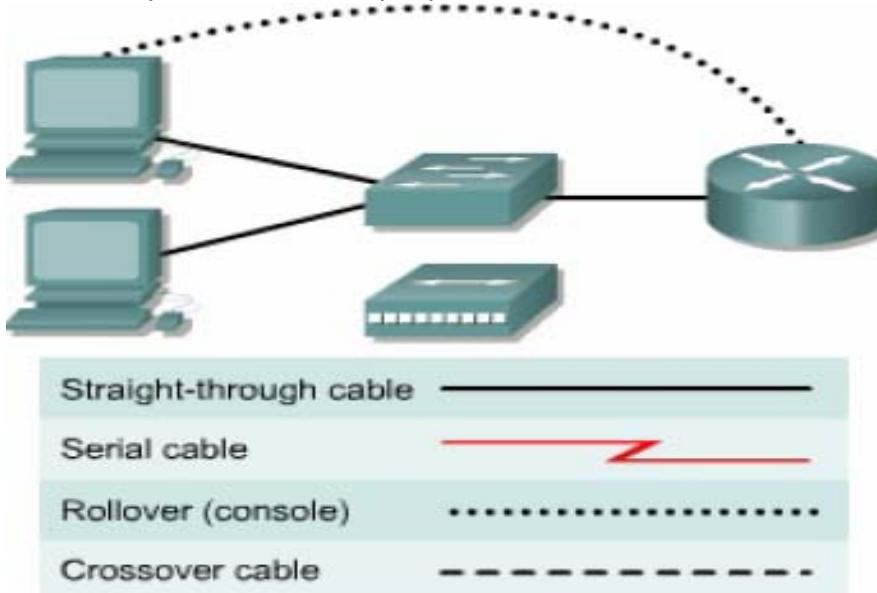


Connecting Router LAN Interface Learning Objectives

Upon completion of this lab, you will be able to:

- Identify the Ethernet or Fast Ethernet interfaces on the router
- Identify and locate the proper cables to connect the router and PC to a hub or switch



Steps 1: Identify the proper cables and connect router

By using Packet Tracer, draw the logical design as shown above. (You may choose either to use hub or switch) The connection between the router and the hub or switch will be accomplished using a Category 5 straight-through patch cable. Use a cable to connect the Ethernet interface on the router to a port on the hub or switch.

Step 2: Connect the workstation Ethernet cabling

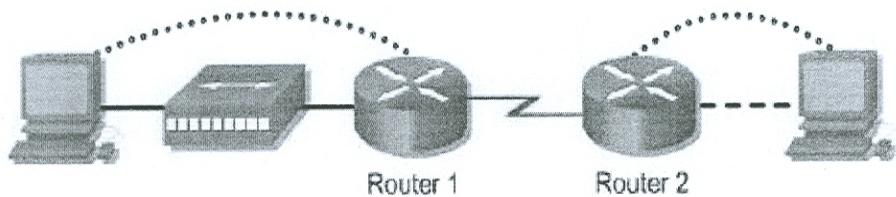
The computer(s) will also connect to the hub using a straight-through patch cable. Run Category 5 patch cables from each PC to where the switch or hub is located. Connect one end of these cables to the RJ-45 connector on the computer NIC and connect the other end to a port on the hub or switch.

Step 3: Verifying the connection

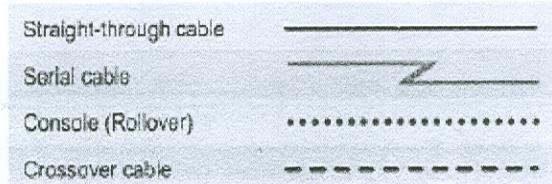
- a) To verify the router connections, ensure that the link light on the router interface and the hub or switch interface are both lit/green.
- b) To verify the computer connections, ensure that the link light on the NIC and the hub or switch interface are both lit/green.

Note: If the light is red, meaning that you have mistakenly connected the devices using right cable. Do re-check your cable type.

Lab Router: Review of Basic Router Configuration with RIP



Router Designation	Router Name	FastEthernet 0 Interface Address	Serial 0 Type	Serial 0 Address	Subnet Mask for Both Interfaces	Enable Secret Password	Enable, VTY and Console Passwords
Router 1	GAD	172.16.0.1	DCE	172.17.0.1	255.255.0.0	class	cisco
Router 2	BHM	172.18.0.1	DTE	172.17.0.2	255.255.0.0	class	cisco



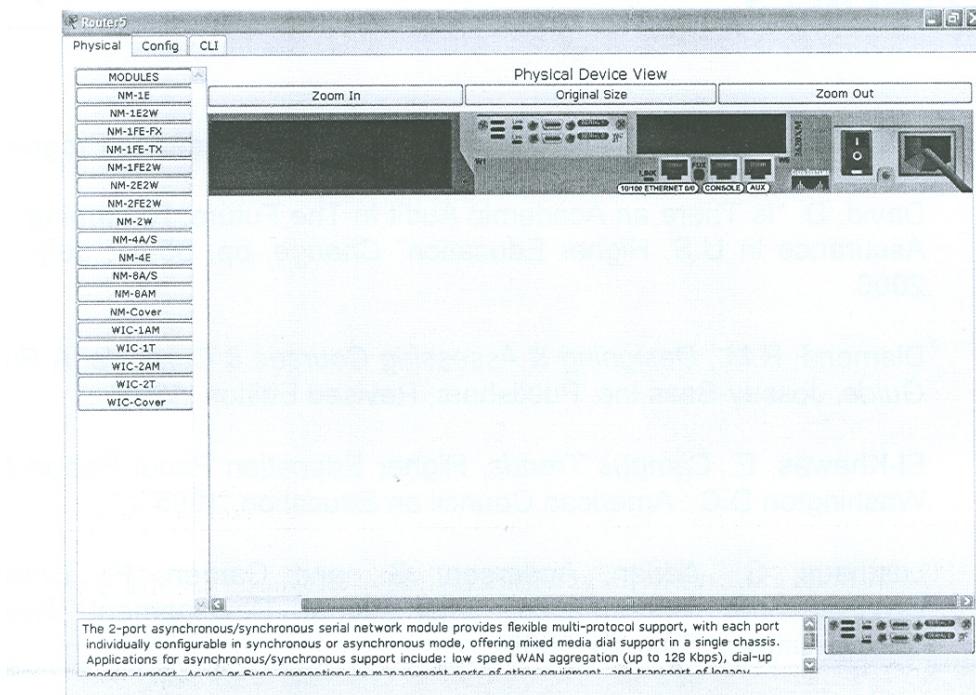
Objective

- Configure workstations and routers
- Setup IP addressing scheme using Class B networks
- Configure Routing Information Protocol (RIP) on routers

Background / Preparation

By using Packet Tracer, draw a network similar to the one shown in the diagram. Any router that meets the interface requirements displayed on the above diagram may be used. For example, router series 800, 1600, 1700, 2500, and 2600 or any such combination can be used. Perform the following steps on each router unless specifically instructed otherwise.

Double click on the first router and a configuration window will pop up. On Physical tab, choose WIC-2T as the interface of the router. You only need to drag and drop the interface to the available slot. Hint: you have to make sure the router is "Off" before you slot in the interface and switch it on back right after you slot in the interface.



Then, go to CLI tab of the window. This is actually the IOS Command Line Interface of this router where you type all necessary commands to configure a router.

```

Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-I-M), Version 12.2(26), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang

cisco 2620 (MP860) processor (revision 0x200) with 60416K/5120K bytes of memory

Processor board ID JAD05190MTZ (4292891495)
MP860 processor: part number 0, mask 49
Bridging software.
X.25 software, Version 3.0.0.
1 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

```

Copy Paste

General Configuration Tips

- a. Use the question mark (?) and arrow keys to help enter commands.
- b. Each command mode restricts the set of available commands. If there is difficulty entering a command, check the prompt and then enter the question mark (?) for a list of available commands. The problem might be a wrong command mode or using the wrong syntax.
- c. To disable a feature, enter the keyword **no** before the command.
- d. There are some important information you need to know pertaining to configuring a router especially on the Router Command Mode. Please refer the table attached.

Router Command Modes			
Command Mode	Access Method	Router Prompt Displayed	Exit Method
User EXEC	Log in.	Router>	Use the logout command.
Privileged EXEC	From user EXEC mode, enter the enable command.	Router#	To exit to user EXEC mode, use the disable , exit , or logout command.
Global configuration	From the privileged EXEC mode, enter the configure terminal command.	Router(config)#	To exit to privileged EXEC mode, use the exit or end command, or press Ctrl-z .
Interface configuration	From the global configuration mode, enter the interface type number command, such as interface serial 0 .	Router(config-if)#	To exit to global configuration mode, use the exit command.

Step 1 : Configure the hostname and passwords on the router GAD

- a. Press Enter button of your keyboard
- b. Enter **enable** at the user mode prompt. Hint: User mode prompt is where you see Router>
- c. Follow the command listed below

```
Router>enable
Router#configure terminal
Router(config)#hostname GAD
GAD(config)#enable secret class
GAD(config)#line console 0
GAD(config-line)#password cisco
GAD(config-line)#login
GAD(config-line)#line vty 0 4
GAD(config-line)#password cisco
```

```
GAD(config-line)#login
GAD(config-line)#exit
GAD(config)#
```

Step 2 : Configure serial interface Serial 0 on router GAD

- From the global configuration mode, configure interface Serial 0 on router GAD.
- ```
GAD(config)#interface serial 0
GAD(config-if)#ip address 172.17.0.1 255.255.0.0
GAD(config-if)#clock rate 64000
GAD(config-if)#no shutdown
GAD(config-if)#exit
```

**Step 3 : Configure the fastethernet 0 interface on router GAD**

```
GAD(config)#interface fastethernet 0
GAD(config-if)#ip address 172.16.0.1 255.255.0.0
GAD(config-if)#no shutdown
GAD(config-if)#exit
```

**Step 4 : Configure the IP host statements on router GAD**

```
GAD(config)#ip host BHM 172.18.0.1 172.17.0.2
```

**Step 5 : Configure RIP routing on router GAD**

```
GAD(config)#router rip
GAD(config-router)#network 172.16.0.0
GAD(config-router)#network 172.17.0.0
GAD(config-router)#exit
GAD(config)#exit
```

**Step 6 : Save the GAD router configuration**

```
GAD#copy running-config startup-config
Destination filename [startup-config]?[Enter]
```

**Step 7 : Configure hostname and passwords on the router BHM**

- Go to the second router and repeat the whole process starting with choosing the WIC-2T interface, slotting in the interface to the router and so on.
- Type the following commands on CLI of second router.
- Enter **enable** at the user mode prompt.

```
Router>enable
Router#configure terminal
Router(config)#hostname BHM
BHM(config)#enable secret class
BHM(config)#line console 0
BHM(config-line)#password cisco
```

---

---

```
BHM(config-line)#login
BHM(config-line)#line vty 0 4
BHM(config-line)#password cisco
BHM(config-line)#login
BHM(config-line)#exit
BHM(config)#+
```

**Step 8 : Configure serial interface Serial 0 on router BHM**

- From the global configuration mode, configure interface Serial 0 on router BHM.

```
BHM(config)#interface serial 0
BHM(config-if)#ip address 172.17.0.2 255.255.0.0
BHM(config-if)#no shutdown
BHM(config-if)#exit
```

**Step 9 : Configure the fastethernet 0 interface on router BHM**

```
BHM(config)#interface fastethernet 0
BHM(config-if)#ip address 172.18.0.1 255.255.0.0
BHM(config-if)#no shutdown
BHM(config-if)#exit
```

**Step 10 : Configure the IP host statements on router BHM**

```
BHM(config)#ip host GAD 172.16.0.1 172.17.0.1
```

**Step 11 : Configure RIP routing on router BHM**

```
BHM(config)#router rip
BHM(config-router)#network 172.18.0.0
BHM(config-router)#network 172.17.0.0
BHM(config-router)#exit
BHM(config)#exit
```

**Step 12 : Save the BHM router configuration**

```
BHM#copy running-config startup-config
```

Destination filename [startup-config]?[Enter]

**Step 13 : Configure the hosts with the proper IP address, subnet mask, and default gateway**

- Host connected to router GAD

IP Address: 172.16.0.2  
Subnet mask: 255.255.0.0  
Default gateway: 172.16.0.1

---

- 
- b. Host connected to router BHM

IP Address: 172.18.0.2

Subnet mask: 255.255.0.0

Default gateway: 172.18.0.1

**Step 14 : Verify that the internetwork is functioning by pinging the Fast Ethernet interface of the other router**

- a. From the host attached to GAD, ping the BHM router Fast Ethernet interface. Was the ping successful? \_\_\_\_\_
- b. From the host attached to BHM, ping the GAD router Fast Ethernet interface. Was the ping successful? \_\_\_\_\_
- c. If the answer is no for either question, troubleshoot the router configurations to find the error.
- d. Then do the pings again until the answer to both questions is yes. Then ping all interfaces in the network.

**Step 15 : Show the routing tables for each router**

- a. From the enable privileged EXEC mode:

Examine the routing table entries, using the **show ip route** command on each router.

- b. What are the entries in the GAD routing table?
- 

- c. What are the entries in the BHM routing table?
-

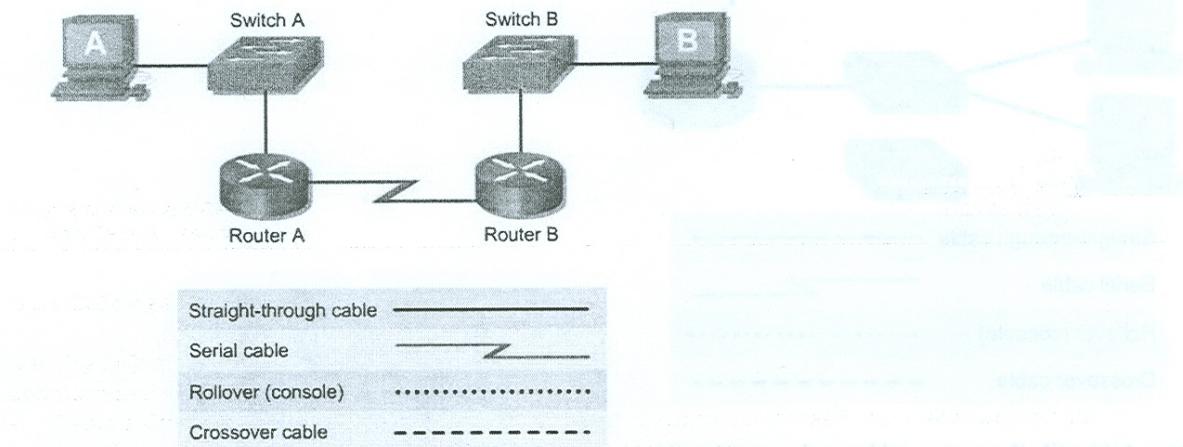
## Lab 6: Building a Basic Routed WAN

Lab 6: Connecting Routers LAN ports

### Learning Objectives

Upon completion of this lab, you will be able to:

- Create a simple routed wide-area network (WAN) with two PCs, two switches or hubs, and two routers
- Identify the proper cables to connect a PC and router to each switch
- Identify the proper cables to connect the routers to form a WAN link
- Configure workstation IP address information



### Step 1: Cable the router LAN links

#### a) Router configuration

The routers should be configured so that the Ethernet 0 interface on each router has the proper IP address and subnet mask as indicated in the table below. This will allow the routers to route packets between local-area networks 192.168.1.0 and 192.168.2.0.

| Router     | E0 Interface IP Address | Subnet mask   |
|------------|-------------------------|---------------|
| Router – A | 192.168.1.1             | 255.255.255.0 |
| Router – B | 192.168.2.1             | 255.255.255.0 |

#### b) Connecting the cables

The connection between the router and the hub or switch will be accomplished using a Category 5 straight-through patch cable.

### Step 2: Verify the physical Ethernet connections

#### a) To verify the connections, ensure that the link lights on the both PC NICs, both switch/hub interfaces and router Ethernet interfaces are lit. Are all link lights lit? \_\_\_\_\_ If not, check connections and cable types.

### Step 3: Identify the serial interfaces on the router

- a) Examine the routers.
- b) Identify the serial ports on each router that could be used for connecting the routers to simulate a WAN link.

Record the information below. If there is more than one serial interface, use Interface 0 on each router.

| Router Name | Router Serial Port | Router Serial Port |
|-------------|--------------------|--------------------|
| Router A    |                    |                    |
| Router B    |                    |                    |

#### Step 4 Cable the router WAN link

##### a) Router configuration

Router A should be to provide the DCE clock signal on the Serial 0 interface. The Serial 0 interface on each router should have the proper IP address and subnet mast as indicated in the table below. The network interconnecting the router serial interfaces is 192.168.3.0.

| Router     | Clocking | S0 Interface IP Address | Subnet mask   |
|------------|----------|-------------------------|---------------|
| Router - A | DCE      | 192.168.3.1             | 255.255.255.0 |
| Router - B | DTE      | 192.168.3.2             | 255.255.255.0 |

#### Step 5 Configure Workstation IP settings

| Computer | IP Address  | Subnet mask   | Default Gateway |
|----------|-------------|---------------|-----------------|
| PC - A   | 192.168.1.2 | 255.255.255.0 | 192.168.1.1     |
| PC - B   | 192.168.2.2 | 255.255.255.0 | 192.168.2.1     |

#### Step 6 Verify that PCs can communicate across the WAN

##### a) Test-connectivity

Ping the IP address of the computer on the other LAN. Enter the following command at the command prompt on PC-B.

**C:>ping 192.168.1.2**

Enter the following command at the command prompt on PC-A.

**C:>ping 192.168.2.2**

This will test IP connectivity from one workstation through its switch and router across the WAN link and through the other router and switch to the other PC.

##### b) Look for results similar to those shown below. If not, check the PC connections and TCP/IP settings for both PCs. What was the ping result?