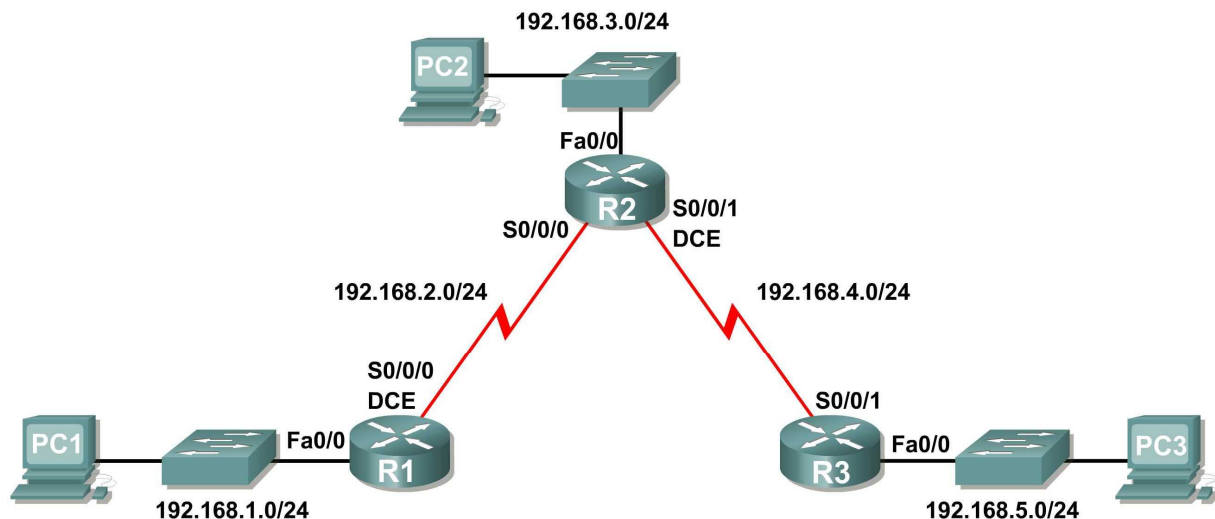


## Lab 7: Basic RIP Configuration

### Topology Diagram



### Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	Fa0/0	192.168.1.1	255.255.255.0	N/A
	S0/0/0	192.168.2.1	255.255.255.0	N/A
R2	Fa0/0	192.168.3.1	255.255.255.0	N/A
	S0/0/0	192.168.2.2	255.255.255.0	N/A
	S0/0/1	192.168.4.2	255.255.255.0	N/A
R3	Fa0/0	192.168.5.1	255.255.255.0	N/A
	S0/0/1	192.168.4.1	255.255.255.0	N/A
PC1	NIC	192.168.1.10	255.255.255.0	192.168.1.1
PC2	NIC	192.168.3.10	255.255.255.0	192.168.3.1
PC3	NIC	192.168.5.10	255.255.255.0	192.168.5.1

#### Step 1: Configure the routers

On the routers, enter global configuration mode and configure the hostname as shown on the chart. Then configure the console, virtual terminal lines password (both "cisco") and privileged EXEC password ("class"):

#### Step 2: Add the `logging synchronous` command to the console and virtual terminal lines

This command is very helpful in both lab and production environments and uses the following syntax:

```
Router(config-line)#logging synchronous
```

### Step 3: Disable DNS lookup

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

### Step 4: Configure the interfaces on R1, R2, and R3

Configure the interfaces on the R1, R2, and R3 routers with the IP addresses from the table under the Topology Diagram.

### Step 5: Verify IP addressing and interfaces

Use the `show ip interface brief` command to verify that the IP addressing is correct and that the interfaces are active.

### Step 6: Configure Ethernet interfaces of PC1, PC2, and PC3

Configure the Ethernet interfaces of PC1, PC2, and PC3 with the IP addresses and default gateways from the table under the Topology Diagram.

### Step 7: Test the PC configuration by pinging the default gateway from the PC

## Task: Configure RIP

### Step 1: Enable dynamic routing

To enable a dynamic routing protocol, enter global configuration mode and use the `router` command.

Enter `router ?` at the global configuration prompt to see a list of available routing protocols on your router.

To enable RIP, enter the command `router rip` in global configuration mode.

```
Router(config)#router rip
```

### Step 2: Enter classful network addresses

Once you are in routing configuration mode, enter the classful network address **for each directly connected network**, using the `network` command with the following syntax:

```
Router(config-router)#network <network_nr>  
Router(config-router)#network <network_nr>
```

The `network` command:

- Enables RIP on all interfaces that belong to this network. These interfaces will now both send and receive RIP updates.
- Advertises this network in RIP routing updates sent to other routers every 30 seconds.

## Task: Verify RIP Routing

### Step 1: Use the `show ip route` command to verify that each router has all of the networks in the topology entered in the routing table

Routes learned through RIP are coded with an **R** in the routing table.

### Step 2: Use the `show ip protocols` command to view information about the routing processes

The `show ip protocols` command can be used to view information about the routing processes that are occurring on the router. This output can be used to verify most RIP parameters to confirm that:

- RIP routing is configured
- The correct interfaces send and receive RIP updates
- The router advertises the correct networks
- RIP neighbors are sending updates

### Step 3: Use the `debug ip rip` command to view the RIP messages being sent and received

Rip updates are sent every 30 seconds so you may have to wait for debug information to be displayed.

For example:

```
R1#debug ip rip
R1#RIP: received v1 update from 192.168.2.2 on Serial0/0/0
      192.168.3.0 in 1 hops
      192.168.4.0 in 1 hops
      192.168.5.0 in 2 hops
RIP: sending v1 update to 255.255.255.255 via FastEthernet0/0 (192.168.1.1)
RIP: build update entries
      network 192.168.2.0 metric 1
      network 192.168.3.0 metric 2
      network 192.168.4.0 metric 2
      network 192.168.5.0 metric 3
RIP: sending v1 update to 255.255.255.255 via Serial0/0/0 (192.168.2.1)
RIP: build update entries
      network 192.168.1.0 metric 1
```

The debug output shows that R1 receives an update from R2. Notice how this update includes all the networks that R1 does not already have in its routing table. Because the FastEthernet0/0 interface belongs to the 192.168.1.0 network configured under RIP, R1 builds an update to send out that interface. The update includes all networks known to R1 except the network of the interface. Finally, R1 builds an update to send to R2. Because of split horizon, R1 only includes the 192.168.1.0 network in the update.

### Step 4: Discontinue the debug output with the `undebug all` command

```
R1#undebug all
All possible debugging has been turned off
```

### Step 5: Show only RIP statements in the routing table

- Enter `show ip route rip` command
- What is the administrative distance of RIP? 120/1

### Step 6: Last route update

- Check the routing table for a specific route (IOS version must be at least 12.x)  
For example: Enter `show ip route 192.168.1.0`
- When was the last update? 11 seconds
- What is the default update time for RIP? 30 seconds

### Step 7: Configure your router to stop sending updates out the FastEthernet0/0 interface

Sending updates out this interface wastes the bandwidth and processing resources of all devices on the LAN. In addition, advertising updates on a broadcast network is a security risk. RIP updates can be intercepted with packet sniffing software. Routing updates can be modified and sent back to the router, corrupting the router table with false metrics that misdirects traffic.

The `passive-interface fastethernet 0/0` command in routing configuration mode is used to disable sending RIPv1 updates out that interface.

```
Router(config-router)#passive-interface fastethernet 0/0
```

### **Step 8: Verify that updates are not sent to interface FastEthernet0/0 anymore**

You can use `show ip protocols` to ensure FastEthernet0/0 is passive. You can also use `debug ip rip` to ensure that router is not sending any RIP updates to FastEthernet0/0

**Note:** Sometimes it is necessary to clear the dynamic routing table. Try the command

```
Router#clear ip route *
```

on both R1 and R2 (you can also do it on the R3). This command will cause the routers to immediately flush routes in the routing table and request updates from each other.

### **Task: Clean Up**

Erase the configurations and disconnect attached cabling