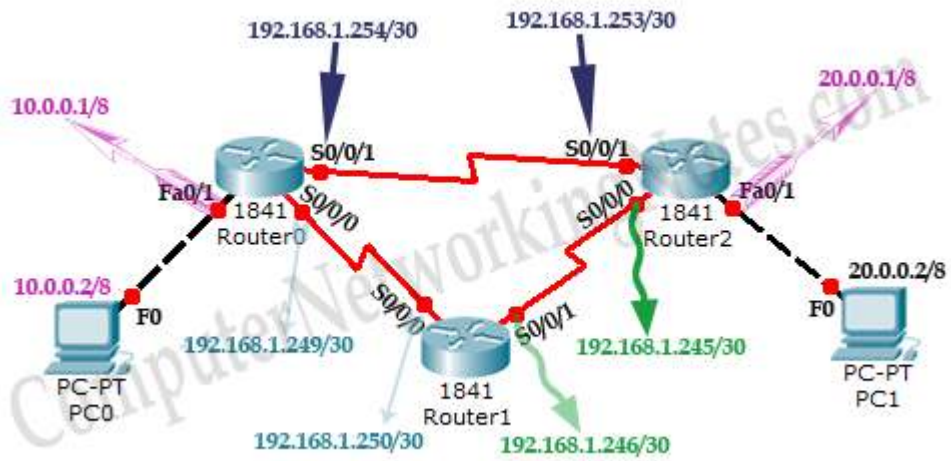
RIP Protocol configuration Guide with Examples

This tutorial explains how to configure RIP Routing protocol step by step in detail. RIP is the simplest and one of the oldest Distance Vector routing protocol. Learn how to enable and configure RIP routing in Cisco router with practical example in packet tracer.

To explain RIP Routing, I will use packet tracer network simulator software. You can use any network simulator software or can use a real Cisco switch to follow this guide. There is no difference in output as long as your selected software contains the commands explained in this tutorial.

Create a practice lab as shown in following figure or download this pre-created practice lab and load in packet tracer

Download RIP Practice Topology



If require, you can download the latest as well as earlier version of Packet Tracer from here. Download Packet Tracer

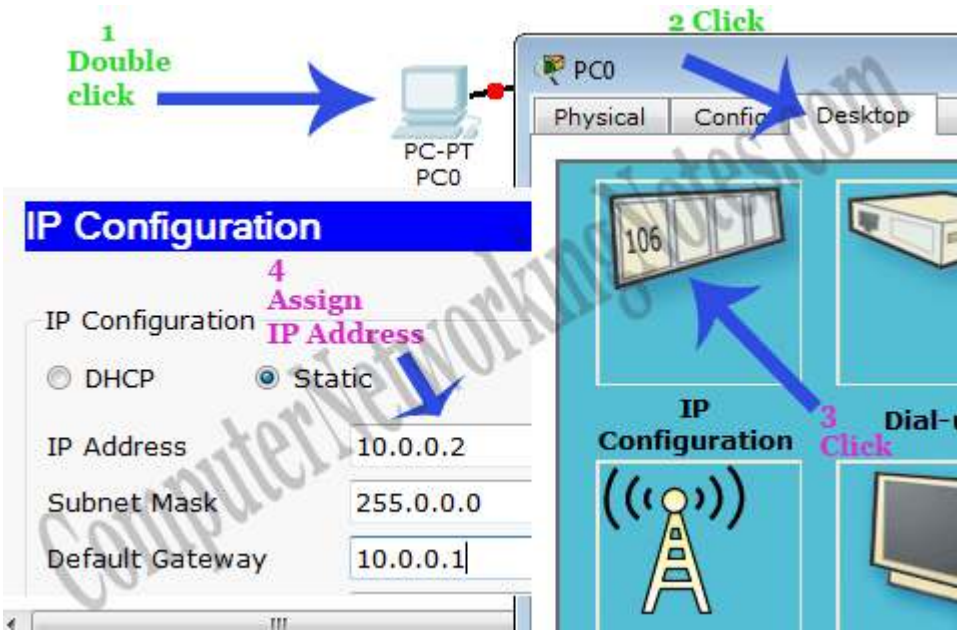
Initial IP configuration

Device	Interface	IP Configuration	Connected with
PC0	Fast Ethernet	10.0.0.2/8	Router0's Fa0/1

Router0	S0/0/0	192.168.1.249/30	Router1's S0/0/0
Router1	S0/0/0	192.168.1.250/30	Router0's S0/0/0
Router1	S0/0/1	192.168.1.246/30	Router2's S0/0/0
Router2	S0/0/0	192.168.1.245/30	Router1's S0/0/1
Router2	S0/0/1	192.168.1.253/30	Router0's S0/0/1
Router2	Fa0/1	20.0.0.1/30	PC1's Fast Ethernet
PC1	Fast Ethernet	20.0.0.2/30	Router2's Fa0/1

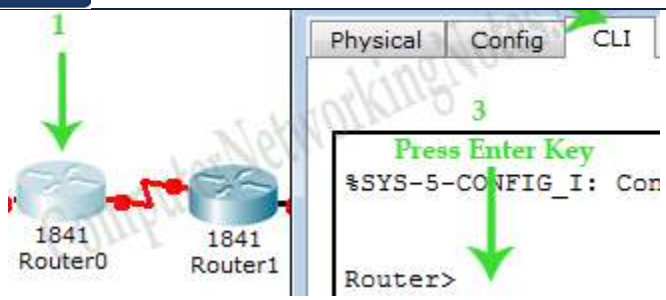
Assign IP address to PCs

Double click **PC0** and click **Desktop** menu item and click **IP Configuration**. Assign IP address 10.0.0.2/8 to PC0.



Repeat same process for PC1 and assign IP address 20.0.0.2/8.

Assign IP address to interfaces of routers



Three interfaces *FastEthernet0/0*, *Serial0/0/0* and *Serial0/0/1* of **Router0** are used in this topology. By default interfaces on router are remain administratively down during the start up.

We need to configure IP address and other parameters on interfaces before we could actually use them for routing. Interface mode is used to assign IP address and other parameters. Interface mode can be accessed from global configuration mode. Following commands are used to access the global configuration mode.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
```

From global configuration mode we can enter in interface mode. From there we can configure the interface. Following commands will assign IP address on FastEthernet0/0.

```
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
```

interface *fastEthernet 0/0* command is used to enter in interface mode.

ip address *10.0.0.1 255.0.0.0* command will assign IP address to interface.

no shutdown command will bring the interface up.

exit command is used to return in global configuration mode.

Serial interface needs two additional parameters **clock rate** and **bandwidth**. Every serial cable has two ends DTE and DCE. These parameters are always configured at DCE end.

```
Interface Serial0/0/0
Hardware is PowerQUICC MPC860
DCE V.35, clock rate 2000000
[Output omitted]
```

Fourth line of output confirms that DCE end of serial cable is attached. If you see DTE here instead of DCE skip these parameters.

Now we have necessary information let's assign IP address to serial interface.

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface serial 0/0/0
Router(config-if)#ip address 192.168.1.249 255.255.255.252
Router(config-if)#clock rate 64000
Router(config-if)#bandwidth 64
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/0/1
Router(config-if)#ip address 192.168.1.254 255.255.255.252
Router(config-if)#clock rate 64000
Router(config-if)#bandwidth 64
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
```

Router#configure terminal Command is used to enter in global configuration mode.

Router(config)#interface *serial 0/0/0* Command is used to enter in interface mode.

Router(config-if)#ip address *192.168.1.249 255.255.255.252* Command assigns IP address to interface. For serial link we usually use IP address from /30 subnet.

Router(config-if)#clock rate *64000* And **Router(config-if)#bandwidth *64*** In real life environment these parameters control the data flow between serial links and need to be set at service providers end. In lab environment we need not to worry about these values. We can use these values.

Router(config-if)#no shutdown Command brings interface up.

Router(config-if)#exit Command is used to return in global configuration mode.

Router1

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface serial 0/0/0
Router(config-if)#ip address 192.168.1.250 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/0/1
Router(config-if)#ip address 192.168.1.246 255.255.255.252
Router(config-if)#clock rate 64000
Router(config-if)#bandwidth 64
Router(config-if)#no shutdown
Router(config-if)#exit
```

Use same commands to assign IP addresses on interfaces of Router2.

Router2

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/0/0
Router(config-if)#ip address 192.168.1.245 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/0/1
Router(config-if)#ip address 192.168.1.253 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit
```

Great job we have finished our half journey.To be on same page we have uploaded our practice topology with IP configuration. You can download it form here.

Download RIP Practice Topology with IP Configuration

Configure RIP routing protocol

Configuration of RIP protocol is much easier than you think. It requires only two steps to configure the RIP routing.

Enable RIP routing protocol from global configuration mode.

Tell RIP routing protocol which networks you want to advertise.

Let's configure it in Router0

Router0

```
Router0(config)#router rip
Router0(config-router)# network 10.0.0.0
Router0(config-router)# network 192.168.1.252
Router0(config-router)# network 192.168.1.248
```

router rip command tell router to enable the RIP routing protocol.

network command allows us to specify the networks which we want to advertise. We only need to specify the networks which are directly connected with the router.

That's all we need to configure the RIP. Follow same steps on remaining routers.

Router1

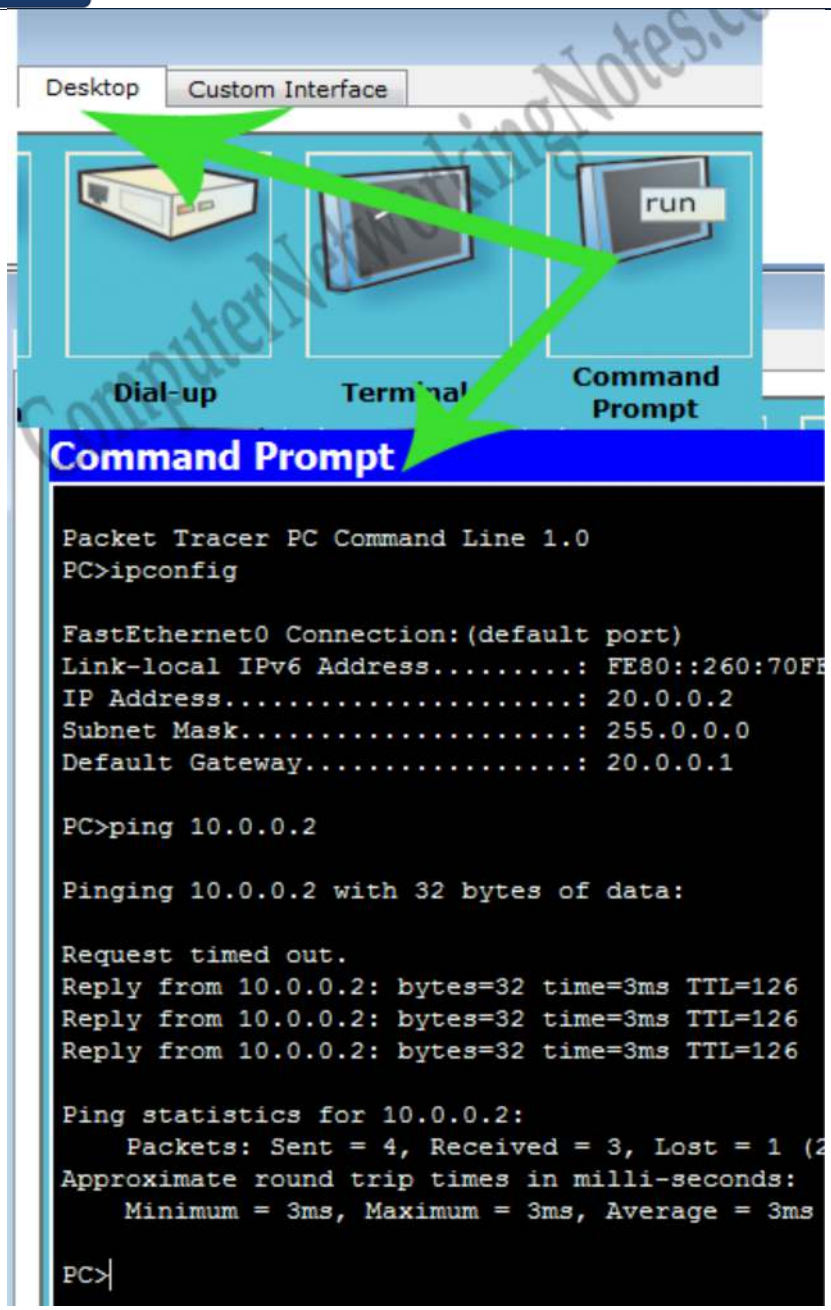
```
Router1(config)#router rip
Router1(config-router)# network 192.168.1.244
Router1(config-router)# network 192.168.1.248
```

Router2

```
Router2(config)#router rip
Router2(config-router)# network 20.0.0.0
Router2(config-router)# network 192.168.1.252
Router2(config-router)# network 192.168.1.244
```

That's it. Our network is ready to take the advantage of RIP routing. To verify the setup we will use ping command. ping command is used to test the connectivity between two devices.

Access the command prompt of **PC1** and use *ping* command to test the connectivity from **PC0**.



Good going we have successfully implemented RIP routing in our network. For cross check we have uploaded a configured topology on our server. You can download and use that if not getting same output.

Download RIP Routing practice topology

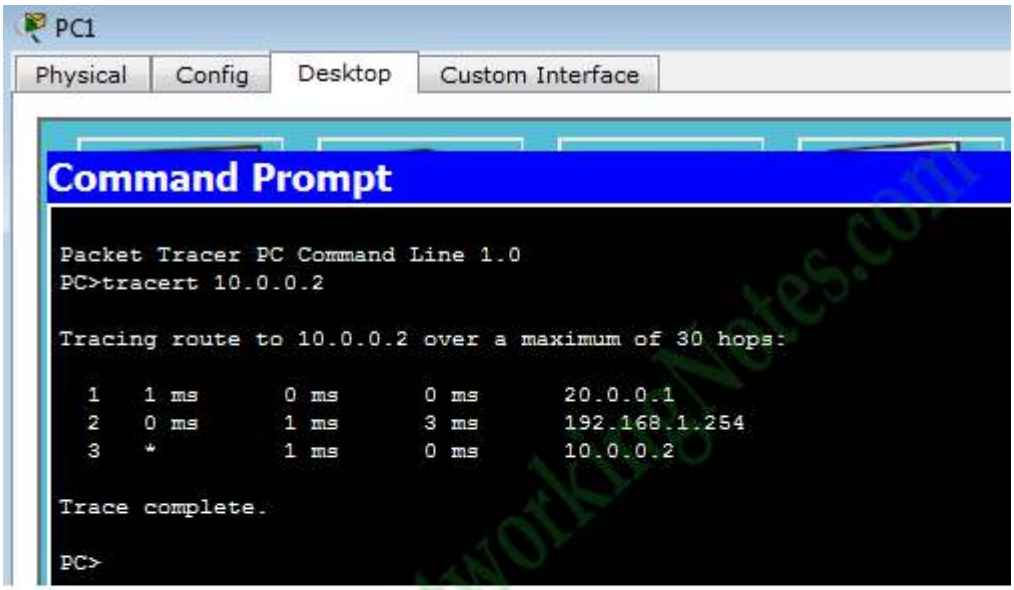
RIP protocol automatically manage all routes for us. If one route goes down, it automatically switches to another available. To explain this process more clearly we have added one more route in our network.

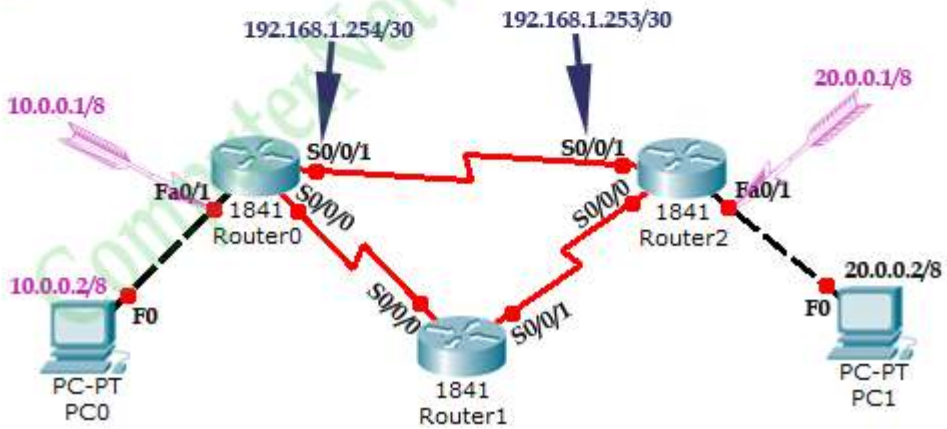
Router0 [Serial0/0/1 – 192.168.1.254] <==> Router2 [Serial 0/0/1 – 192.168.1.253] <==> Router2 [FastEthernet0/0 – 20.0.0.1] <==> PC1 [Destination /source – 20.0.0.2]

Route 2

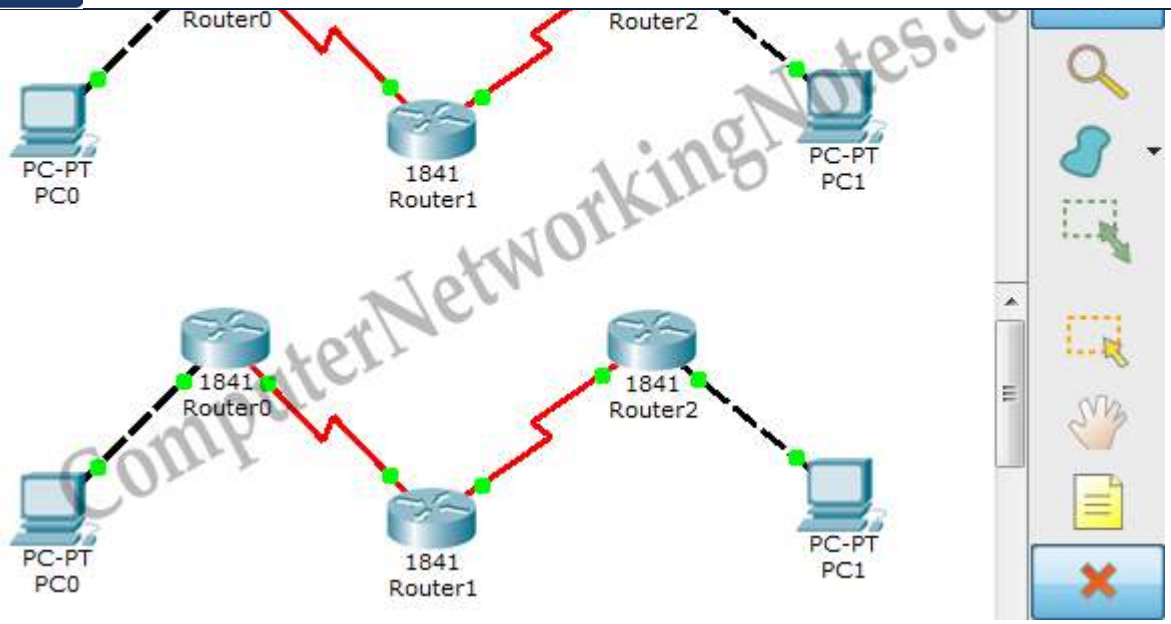
PC0 [Source / destination – 10.0.0.2] <==> Router0 [FastEthernet0/1 – 10.0.0.1] <==> Router0 [Serial0/0/0 – 192.168.1.249] <==> Router1 [Serial 0/0/0 – 192.168.1.250] <==> Router1 [Serial 0/0/1 – 192.168.1.246] <==> Router2 [Serial 0/0/0 – 192.168.1.245] <==> Router2 [FastEthernet0/0 – 20.0.0.1] <==> PC1 [Destination /source – 20.0.0.2]

By default RIP will use the route that has low hops counts between source and destination. In our network route1 has low hops counts, so it will be selected. We can use *tracert* command to verify it.





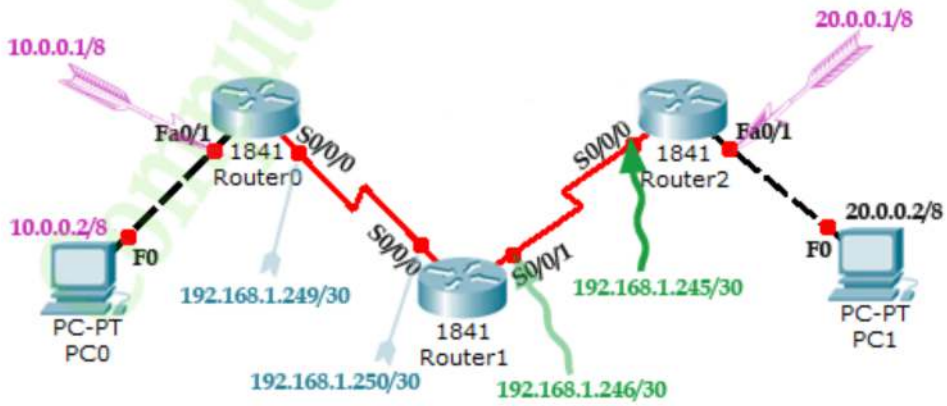
Now suppose route1 is down. We can simulate this situation by removing the cable attached between **Router0 [s0/0/1]** and **Router2 [s0/0/1]**.



Okay our primary route went down. What will be happen now?

So far we are running RIP routing protocol and have another route to destination, there is no need to worry. RIP will automatically reroute the traffic. Use ***tracert*** command again to see the magic of dynamic routing.

```
Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 3ms, Average = 1ms

PC>tracert 10.0.0.2

Tracing route to 10.0.0.2 over a maximum of 30 hops:

  1    1 ms      0 ms      0 ms      20.0.0.1
  2    1 ms      1 ms      1 ms      192.168.1.254
  3    2 ms      1 ms      1 ms      10.0.0.2

Trace complete.

PC>tracert 10.0.0.2

Tracing route to 10.0.0.2 over a maximum of 30 hops:

  1    1 ms      0 ms      0 ms      20.0.0.1
  2    1 ms      0 ms      1 ms      192.168.1.246
  3    1 ms      1 ms      4 ms      192.168.1.249
  4    1 ms      1 ms      4 ms      10.0.0.2

Trace complete.

PC>
```



That's all for this article. In next article we will explain another routing protocol with examples.

RIP Routing protocol configuration commands summary

Command	Description
Router(config)#router rip	Enable RIP routing protocol

Router(config-router)#no network a.b.c.d	Remove a.b.c.d network from RIP routing advertisement
Router(config-router)#version 1	Enable RIP routing protocol version one (default)
Router(config-router)#version 2	Enable RIP routing protocol version two
Router(config-router)#no auto-summary	By default RIPv2 automatically summarize networks in their default classful boundary. This command will turn it off.
Router(config-router)#passive-interface s0/0/0	RIP will not broadcast routing update from this interface
Router(config-router)#no ip split-horizon	Disable split horizon (Enable by default)
Router(config-router)#ip split-horizon	Enable spilt horizon
Router(config-router)#timers basic 30 90 180 270 360	Allow us to set RIP timer in seconds, 30 (routing update), 90 (invalid timer), 180 (Hold timer), 270 (Flush timer), 360 (sleep timer)
Router(config)#no router rip	Disable RIP routing protocol
Router#debug ip rip	Used for troubleshooting. Allow us to view all RIP related activity in real time.
Router#show ip rip database	Display RIP database including routes

By ComputerNetworkingNotes Updated on 2018-08-06 00:41:51 IST

with Examples

RIP - Routing Information Protocol Explained EIGRP Tutorial – Basic concept explained