RIP COMMANDS

AIM

The aim of the experiment is to implement the Routing Information Protocol (RIP) commands.

APPARATUS REQUIRED

Cisco Packet Tracer

THEORY

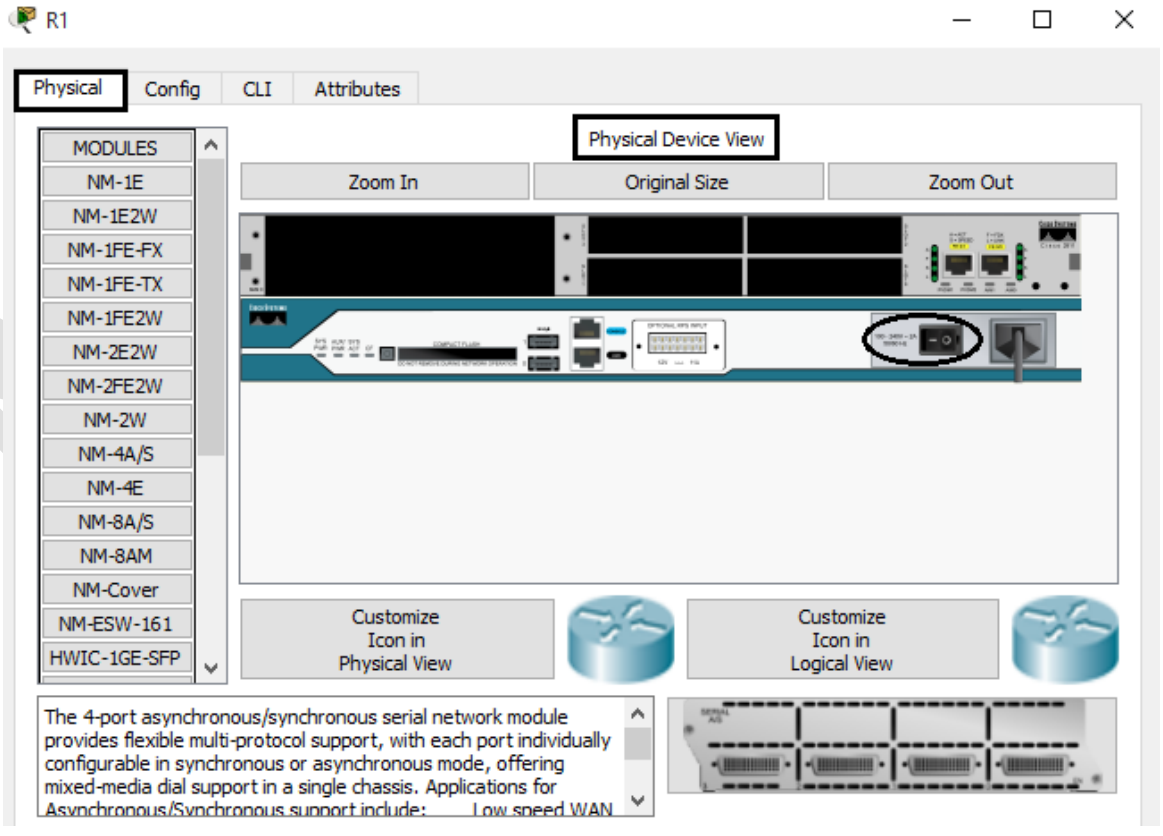
The Routing Information Protocol (RIP) is one of the oldest distance-vector routing protocols which employ the hop count as a routing metric. RIP prevents routing loops by implementing a limit on the number of hops allowed in a path from source to destination. The largest number of hops allowed for RIP is 15, which limits the size of networks that RIP can support. RIP implements the split horizon, route poisoning and hold-down mechanisms to prevent incorrect routing information from being propagated. In RIPv1 router broadcast updates with their routing table every 30 seconds. In the early deployments, routing tables were small enough that the traffic was not significant. As networks grew in size, however, it became evident there could be a massive traffic burst every 30 seconds, even if the routers had been initialized at random times. In most networking environments, RIP is not the preferred choice for routing as its time to converge and scalability are poor compared to EIGRP, OSPF, or IS-IS (Intermediate System to Intermediate System) . However, it is easy to configure, because RIP does not require any parameters unlike other protocols. RIP uses the User Datagram Protocol (UDP) as its transport protocol and is assigned the reserved port number 520.

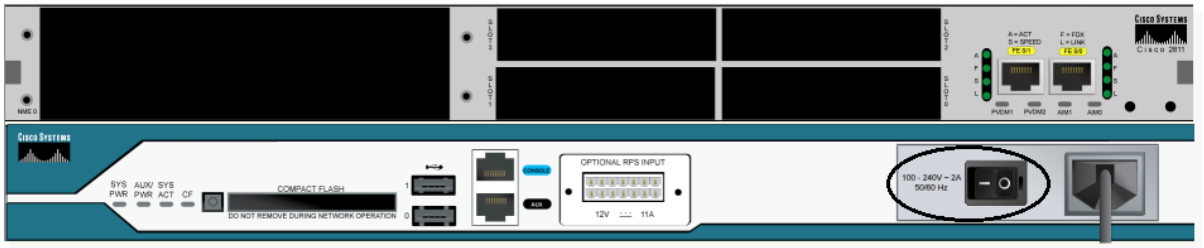
PROCEDURE

1. Press Ctrl+Alt+R to display the Routers panel and place the two 2811 routers: i.e. Router0 and Router1 as shown by dragging them from the panel and dropping them onto the window.

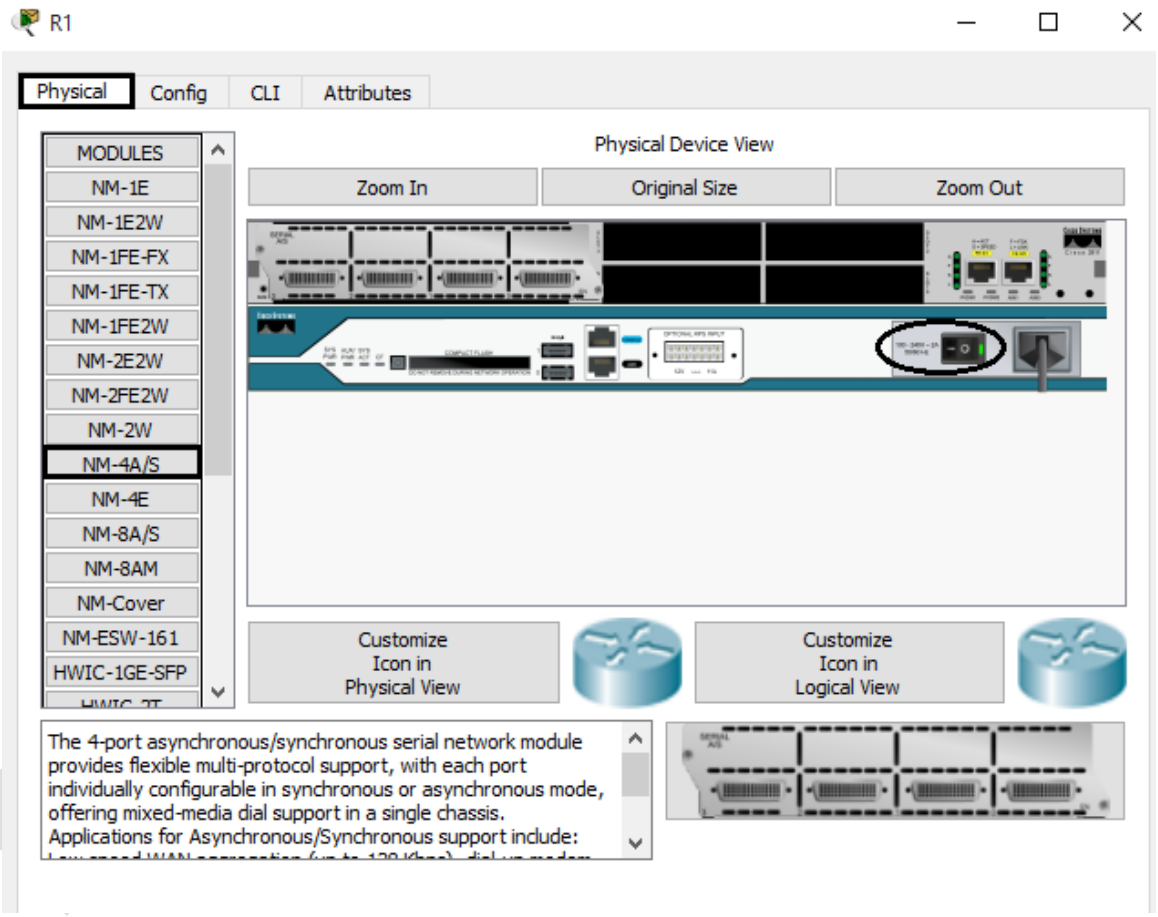
2. You may rename the Routers on the window by clicking once on the text written "Router0" and giving the new name "R1". Similarly, for the Router1 as R2.

3. Click on the Router "R1". Under the Physical tab, scroll to the Physical Device View and switch off the Router by pressing once on the Rocker Switch shown.



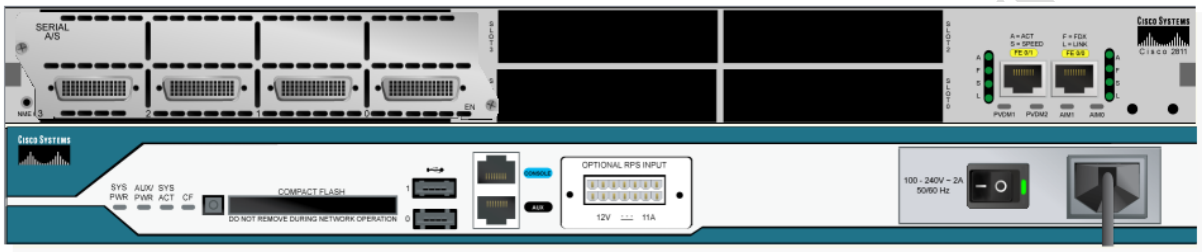


4. Under the Modules, click on the 4-port asynchronous/synchronous serial network module (NM-4A/S) from the list and drag and drop it onto the Router slot as shown in the figure below and then switch the Router back on by pressing the Rocker Switch once.

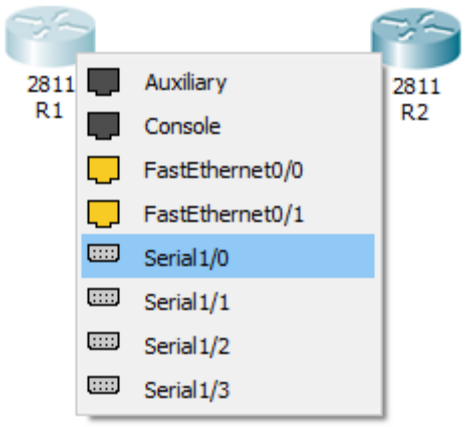


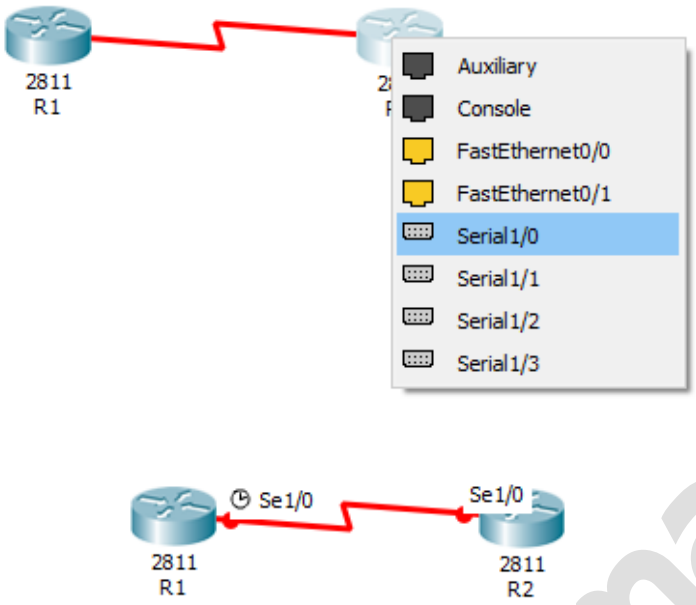
The 4-port asynchronous/synchronous serial network module provides flexible multi-protocol support, with each port individually configurable in synchronous or asynchronous mode, offering mixed-media dial support in a single chassis. Applications for Asynchronous/Synchronous support include: Low speed Wide Area Network (WAN)

aggregation (up to 128 Kbps), dial-up modem support, Async or Sync connections to management ports of other equipment, and transport of legacy protocols such as Bi-sync and Synchronous Data Link Control (SDLC).



5. Repeat the procedure in steps 3 and 4 for the Router "R2" and add the NM-4A/S module to its slot.
6. Press Ctrl+Alt+O to display the connections panel. Select the Serial DCE (Data Circuit-terminating Equipment) cable. Click on the Router R1 and select the Serial1/0 port and then click on the Router R2 and also select the Serial1/0 port to set the connection.





7. Click on the Router R1 and select the CLI (Command Line Interface) tab and enter the following commands. Type “no” or “n” when asked if you would like to enter the initial configuration dialog and press Enter twice.

```
--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/
no]: no
```

Router>enable

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#hostname R1

R1(config)#interface Serial1/0

R1(config-if)#ip address 10.0.0.1 255.0.0.0

R1(config-if)#clock rate 64000

R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial1/0, changed state to down

R1(config-if)#exit

R1(config)#router rip

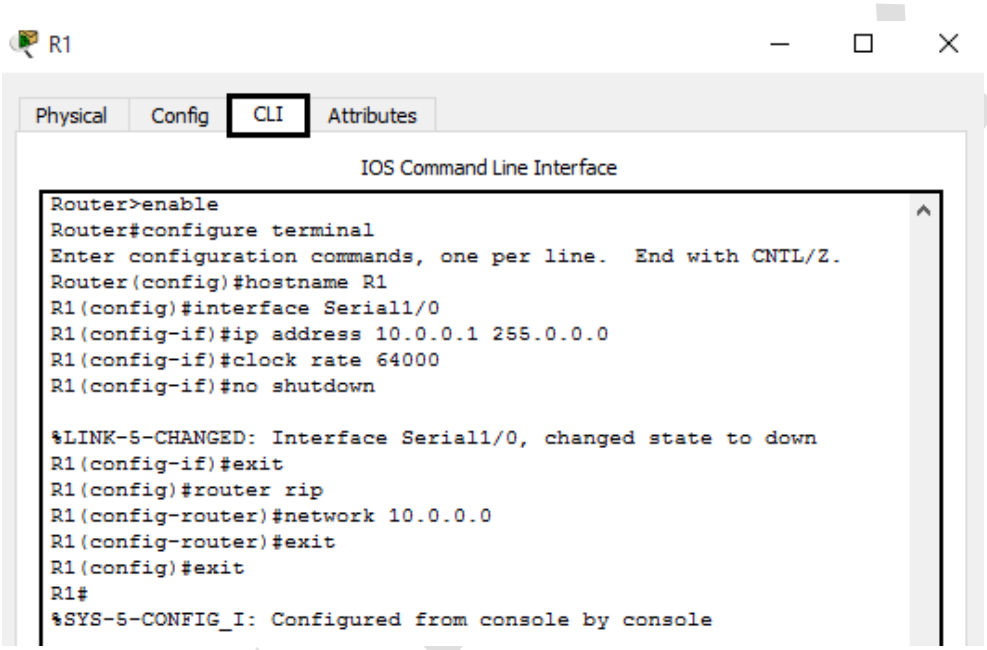
R1(config-router)#network 10.0.0.0

R1(config-router)#exit

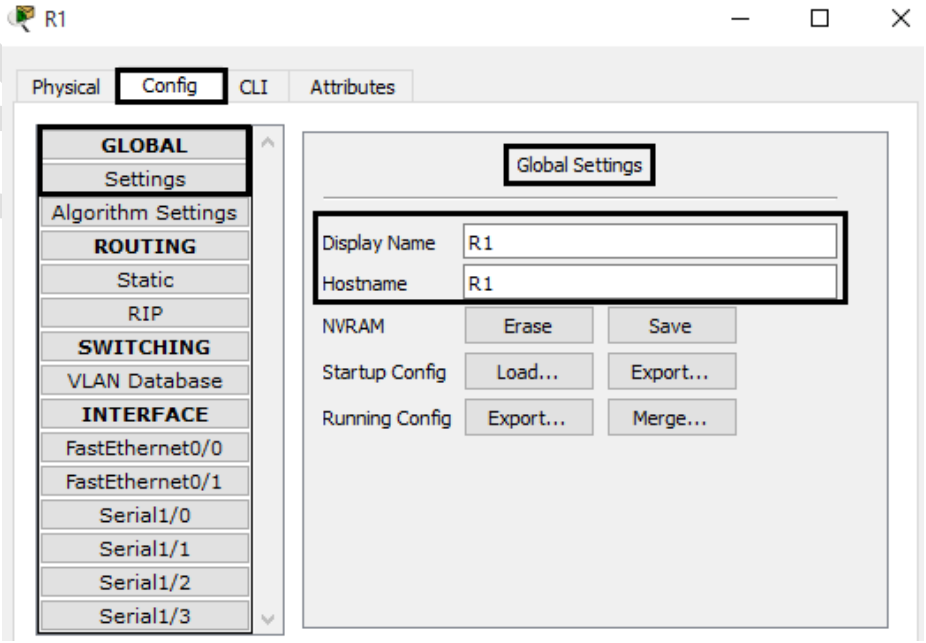
R1(config)#exit

R1#

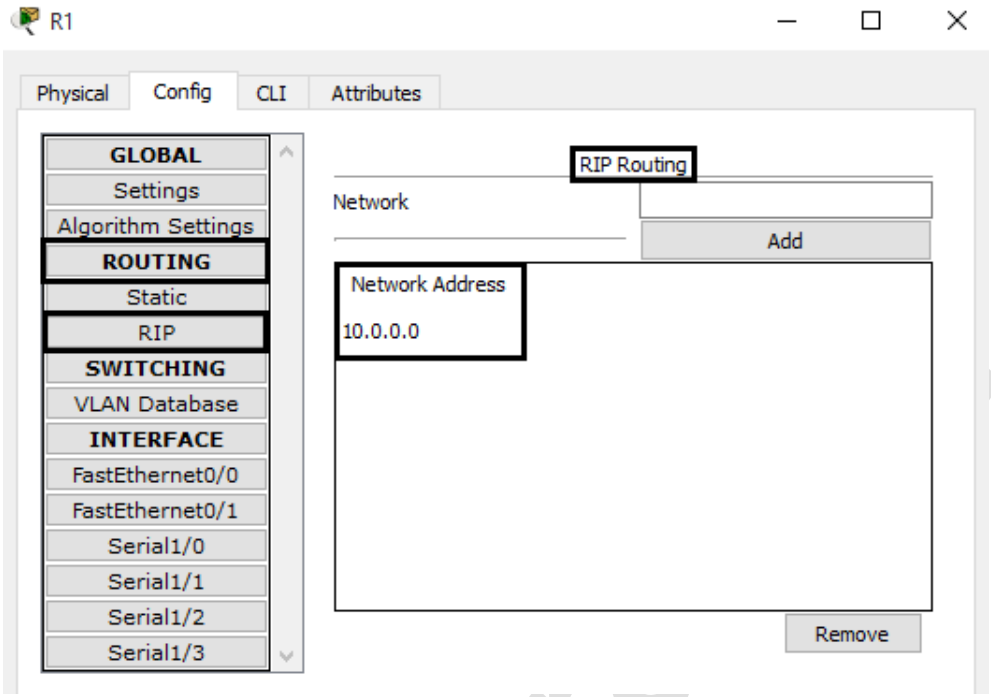
%SYS-5-CONFIG_I: Configured from console by console



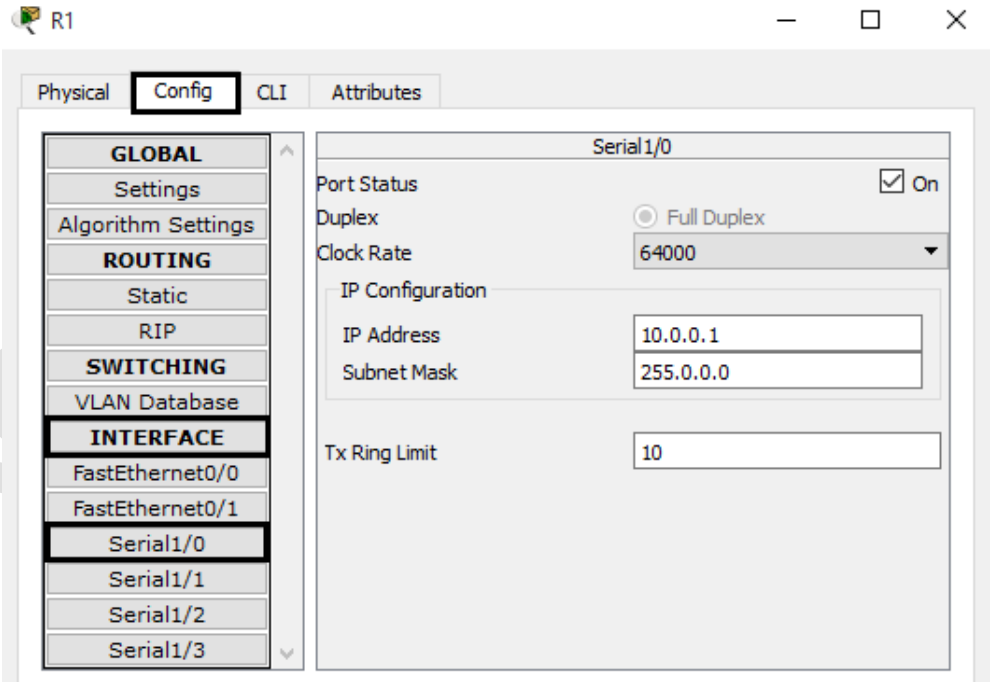
8. Click on the Router R1 and select the “Config” tab. Under the Global Settings tab, verify the display and host name of the Router R1.



9. Under the Routing RIP tab, verify the network address of the Router R1.

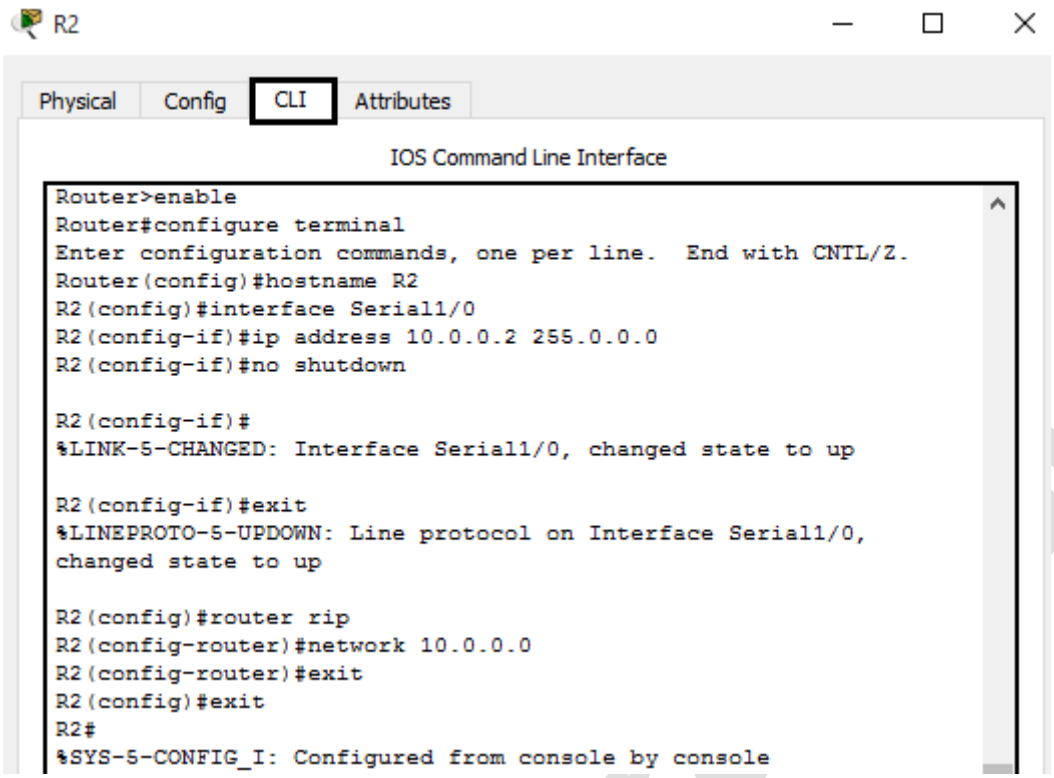


10. Under the Serial 1/0 Interface tab, verify the Port Status, Clock Rate, IP Address and Subnet Mask.

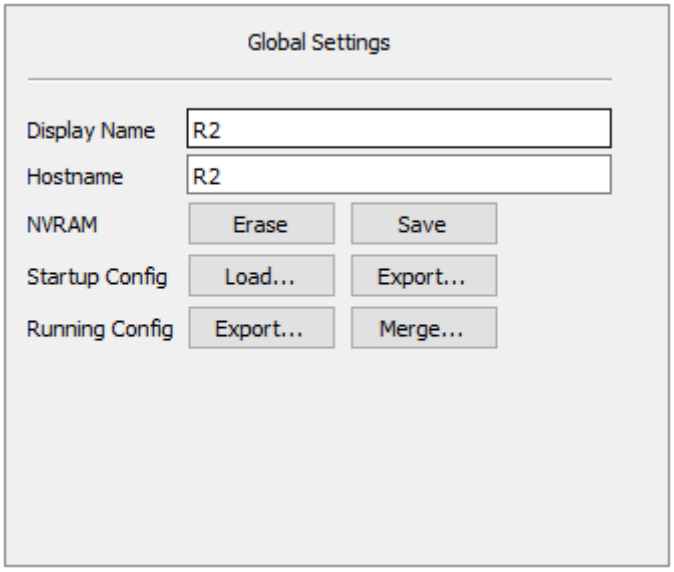


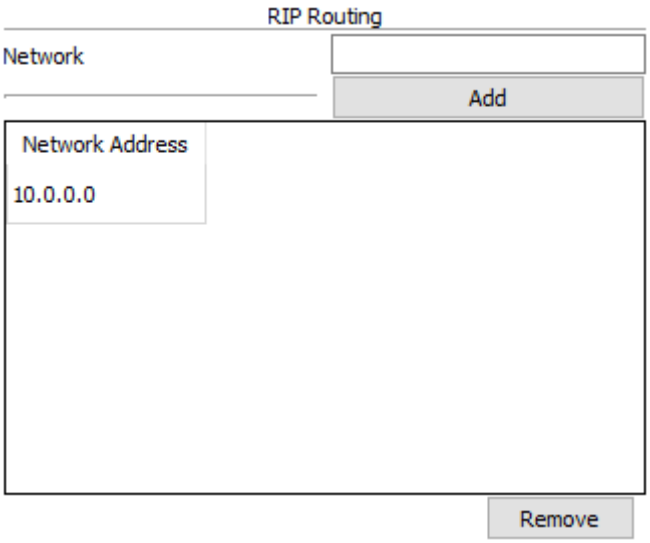
11. Click on the Router R2 and select the CLI (Command Line Interface) tab and enter the commands as in the Router R1.

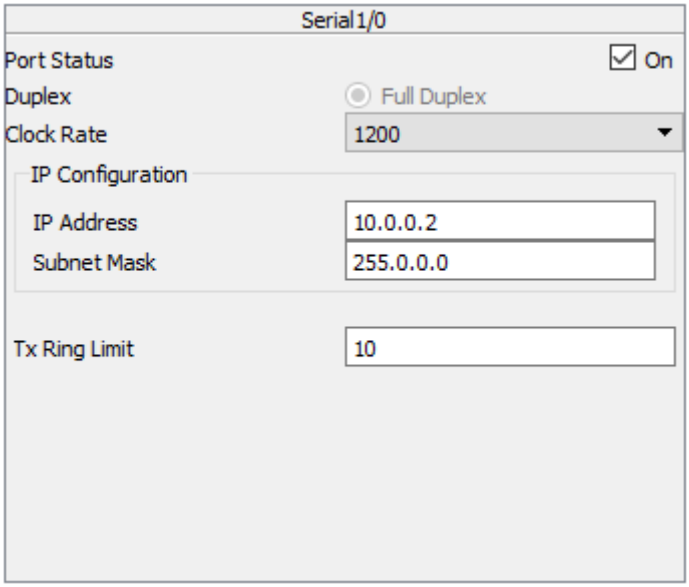
```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
R2(config)#interface Serial1/0
R2(config-if)#ip address 10.0.0.2 255.0.0.0
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface Serial1/0, changed state to up

R2(config-if)#exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up

R2(config)#router rip
R2(config-router)#network 10.0.0.0
R2(config-router)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console
```

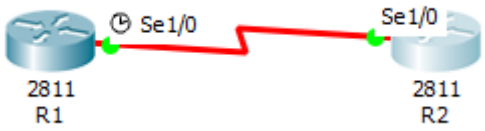


12. Click on the Router R2 and select the "Config" tab to verify the Router's Configuration Settings as in steps 8, 9 and 10 for the Router R1.





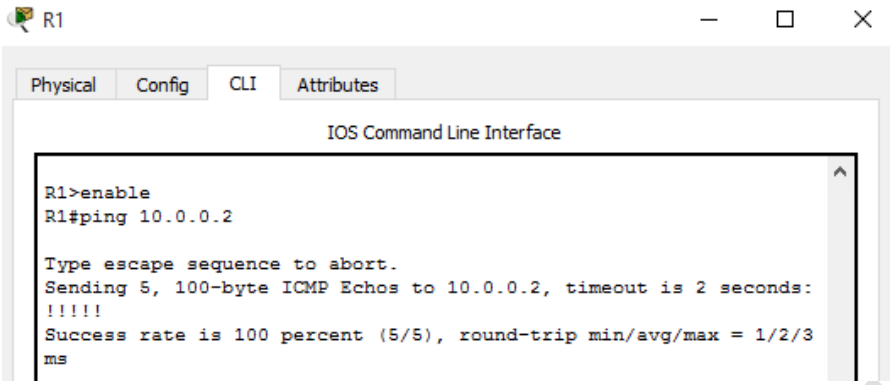




13. Test the connection by the ping command. Select the Router R1 and ping it with the IP address of the Router R2 (10.0.0.2).

    R1>enable

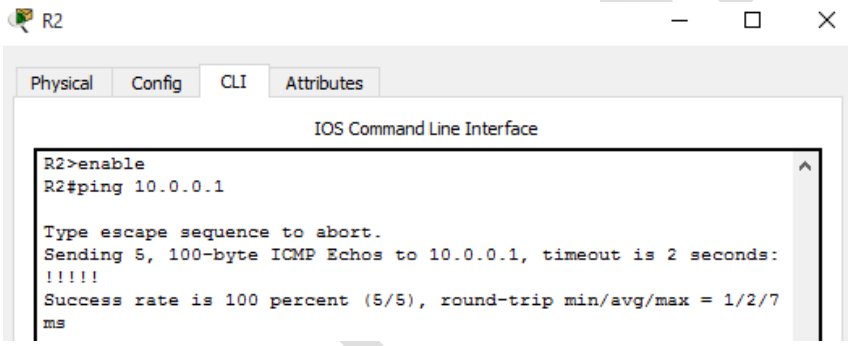
    R1#ping 10.0.0.2



14. Select the Router R2 and ping it with the IP address of the Router R1 (10.0.0.1).

    R2>enable

    R2#ping 10.0.0.1



15. Check the Router's Configuration via the Command Line Interface.

    R1>enable

    R1#show running-config

    Building configuration...

    Current configuration : 853 bytes

    !

    version 12.4

    no service timestamps log datetime msec

    no service timestamps debug datetime msec

    no service password-encryption

!

hostname R1

!

!

!

!

!

!

!

!

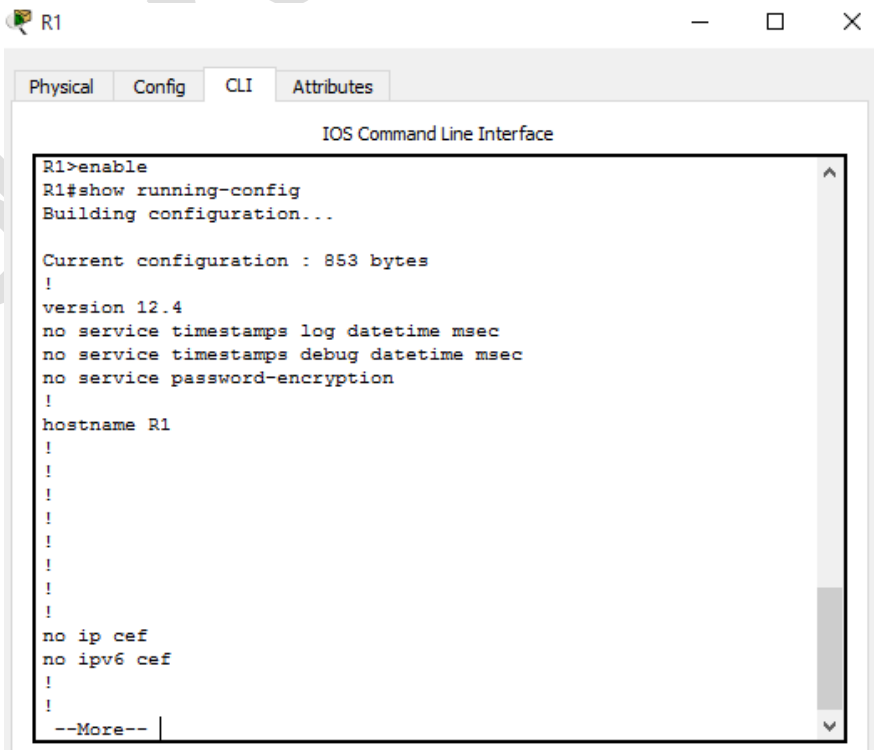
no ip cef

no ipv6 cef

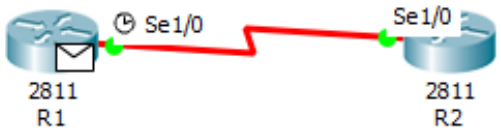
!

!

--More--



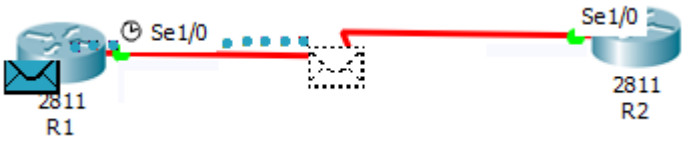
16. Send a Protocol Data Unit (PDU) from the Router R1 to the Router R2 and from the Router R2 to the Router R1 to test the connection by clicking on “Add Simple PDU” or pressing “P” then clicking on the first Router followed by clicking on the next Router. Press Ctrl+Shift+O to toggle the PDU list window and view the Fire Status.

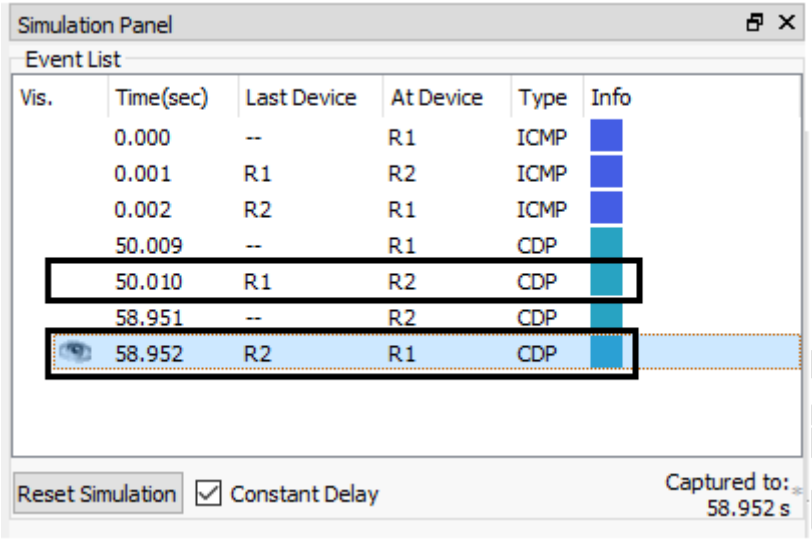


PDU List Window

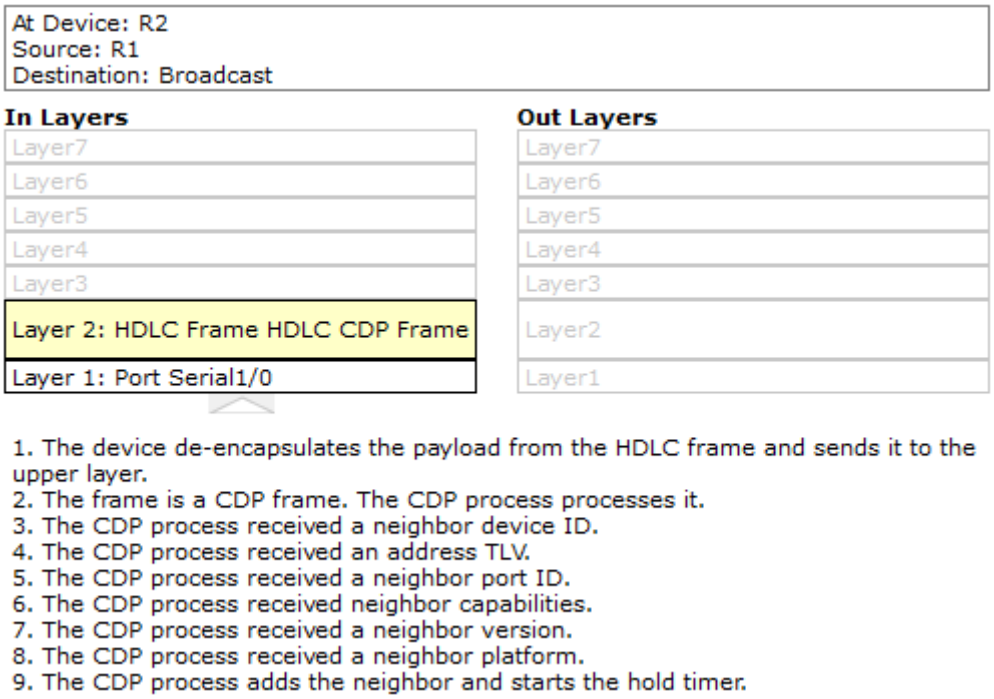
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	R1	R2	ICMP		0.000	N	0	(edit)	(delete)
	Successful	R2	R1	ICMP		0.000	N	1	(edit)	(delete)

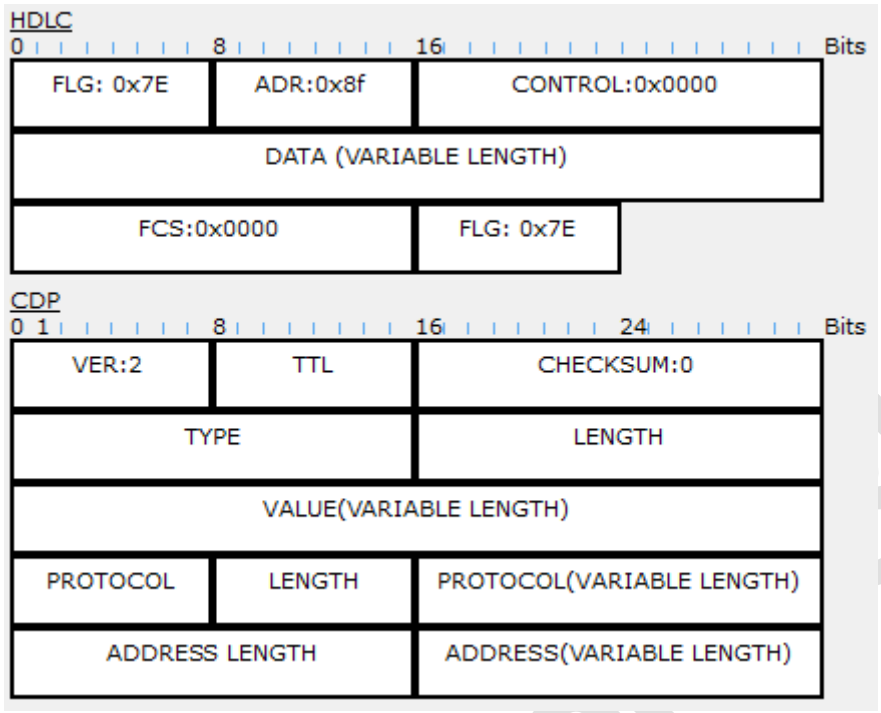
17. Press Ctrl+Shift+D to Delete the Scenario and all PDUs. Press Shift+S to enter into the Simulation Mode. Press “P” to Add a Simple PDU. Click on the Router1 then click on the Router2. Press Alt+C or on the Simulation Panel under the Play Controls click on the Capture/Forward button multiple times until you observe successful implementation of the (Cisco Discovery Protocol) CDP under the Event List on the Type Column.

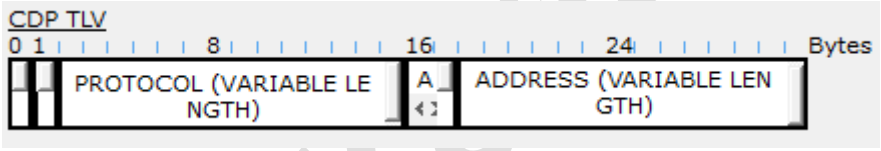




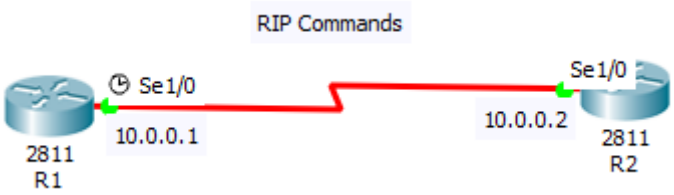
18. Observe the PDU Information at the Device by clicking on the CDP event in the Event List. Under the OSI Model Tab view the "In Layers" model. Click on the Next Layer Button to observe the processes taking place at each layer of an event. Under the Inbound PDU Details tab you may observe the PDU Formats i.e. (High-Level Data Link Control) HDLC, CDP, CDP TLV (Type Length Values).







SAMPLE OUTPUT



RESULT

Thus, the experiment to implement the Routing Information Protocol commands was executed successfully and the output is verified.