BGP COMMANDS

AIM

The aim of the experiment is to implement the Border Gateway Protocol (BGP) commands.

APPARATUS REQUIRED

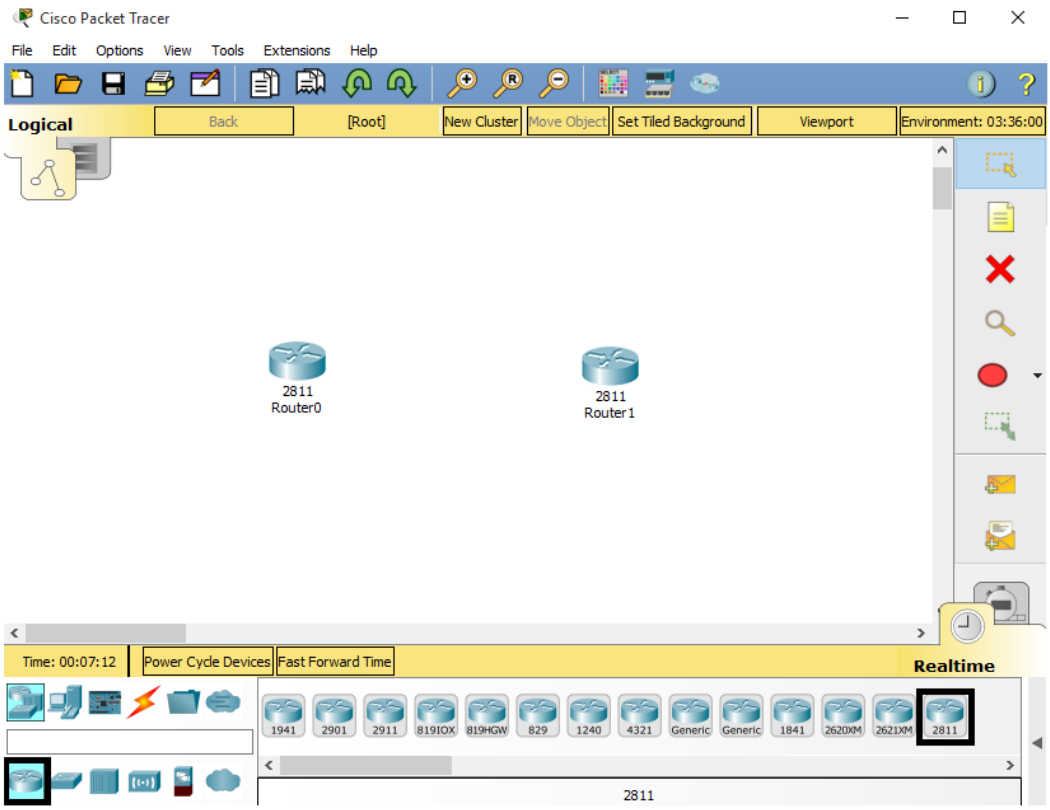
Cisco Packet Tracer

THEORY

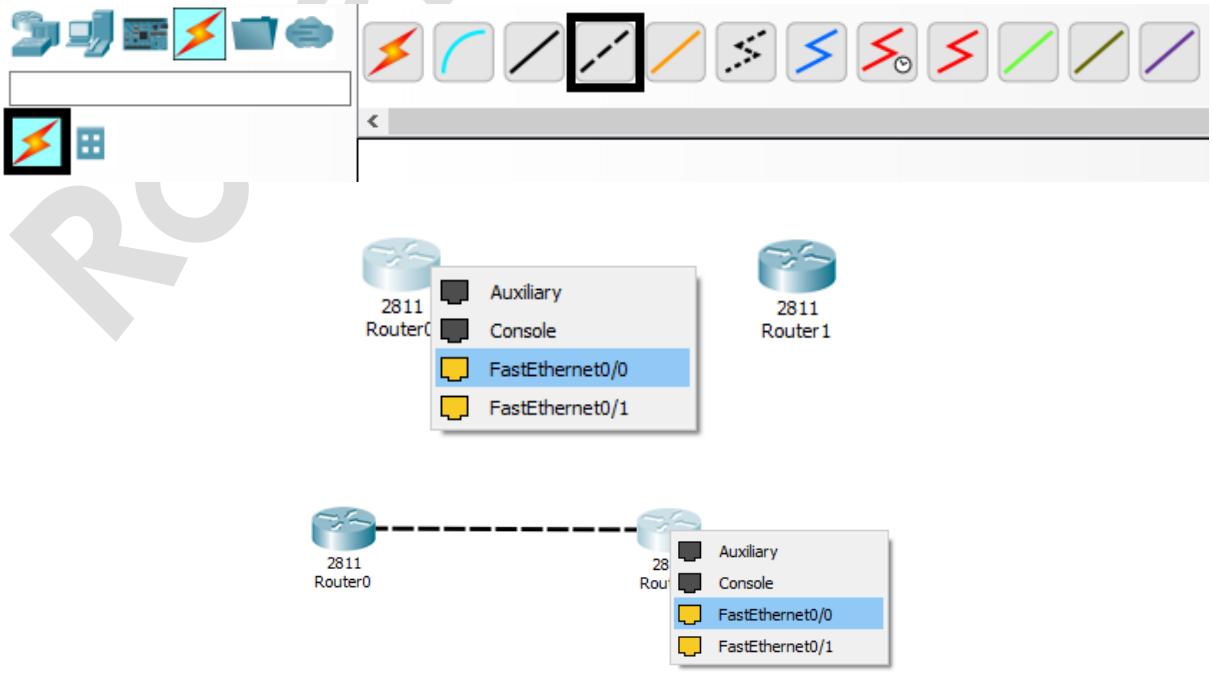
Border Gateway Protocol (BGP) is a standardized exterior gateway protocol designed to exchange routing and reachability information among autonomous systems (AS) on the Internet. The protocol is often classified as a path vector protocol but is sometimes also classed as a distance-vector routing protocol. The Border Gateway Protocol makes routing decisions based on paths, network policies, or rule-sets configured by a network administrator and is involved in making core routing decisions. BGP may be used for routing within an autonomous system. In this application it is referred to as Interior Border Gateway Protocol, Internal BGP, or iBGP. In contrast, the Internet application of the protocol may be referred to as Exterior Border Gateway Protocol, External BGP, or eBGP.

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. Press Ctrl+Alt+O to display the connections panel. Select the copper cross-over cable because we are connecting similar devices. Click on the Router0 and select the FastEthernet0/0 interface and then click on the Router1 and also select the FastEthernet0/0 interface to set the connection.



3. Click on the Router0 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

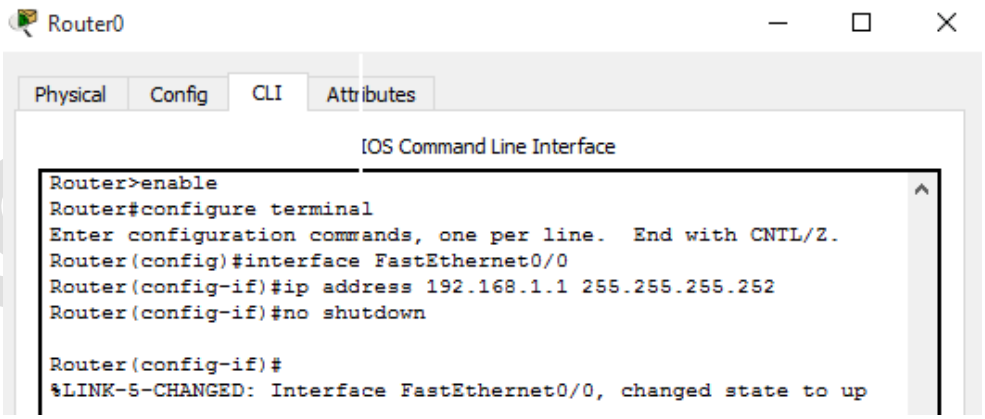
Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface FastEthernet0/0

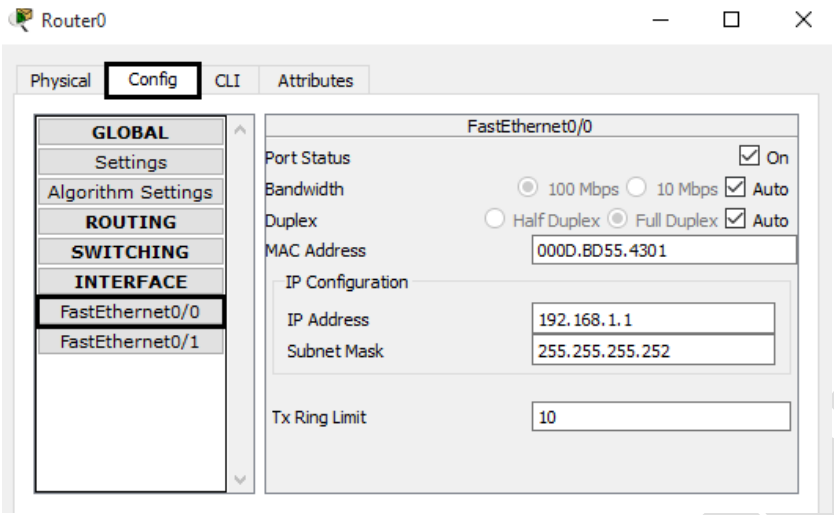
Router(config-if)#ip address 192.168.1.1 255.255.255.252

Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up



4. Click on the Router0 and select the “Config” tab. Under the FastEthernet0/0 tab, verify the configured properties of the Router.



5. Click on the Router1 and select the CLI (Command Line Interface) tab and enter the commands as in the Router0.

   Router>enable

   Router#configure terminal

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

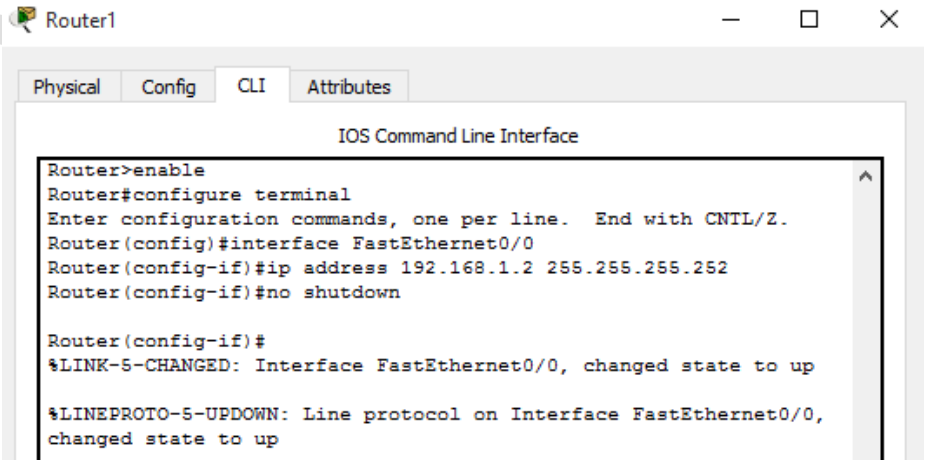
   Router(config)#interface FastEthernet0/0

   Router(config-if)#ip address 192.168.1.2 255.255.255.252

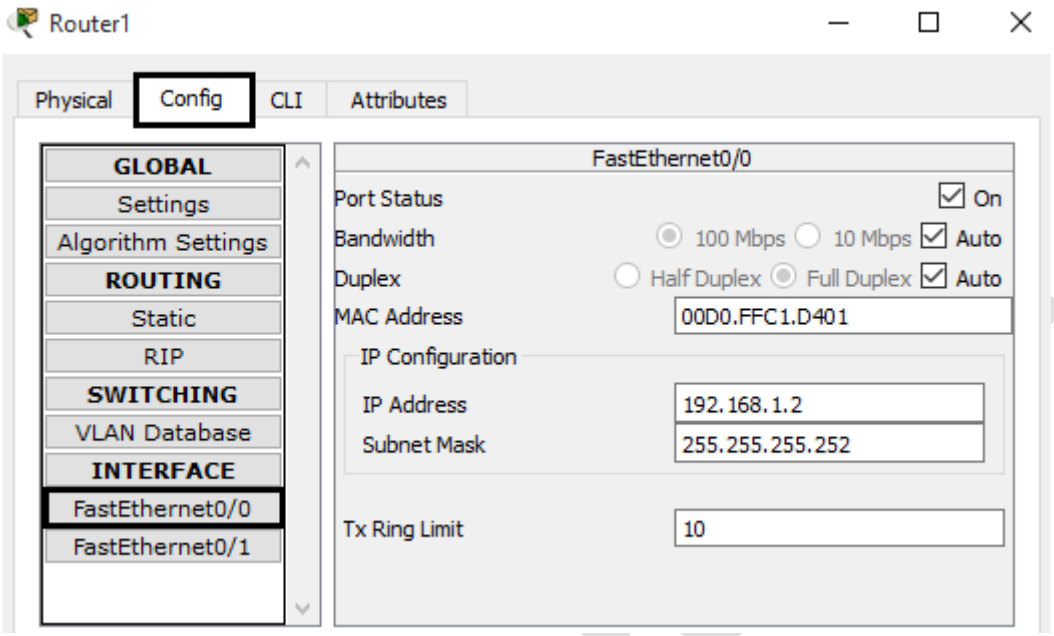
   Router(config-if)#no shutdown

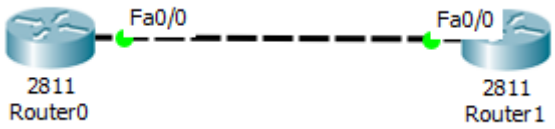
   %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

   %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up



6. Click on the Router1 and select the “Config” tab. Under the FastEthernet0/0 tab, verify the configured properties of the Router.

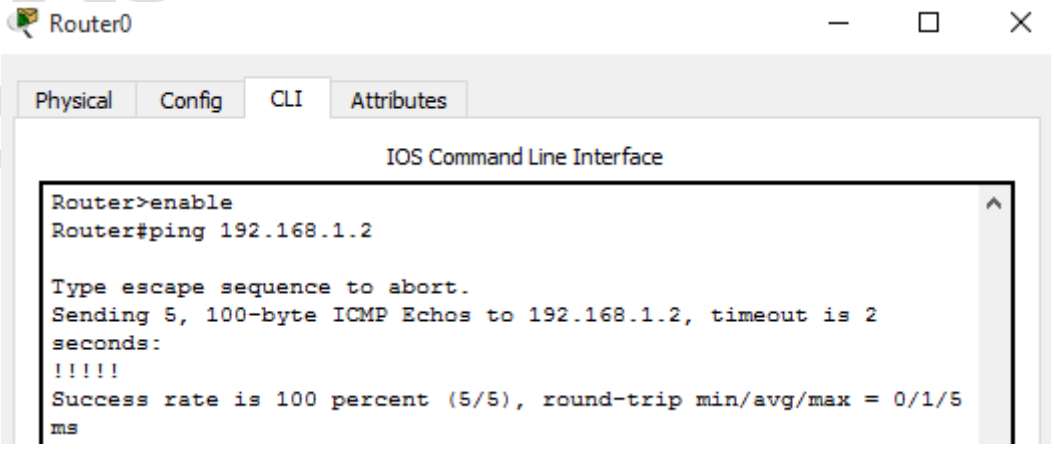




7. Test the connection by the ping command. Select the Router0 and ping it with the IP address of the Router1 (192.168.1.2).

Router>enable

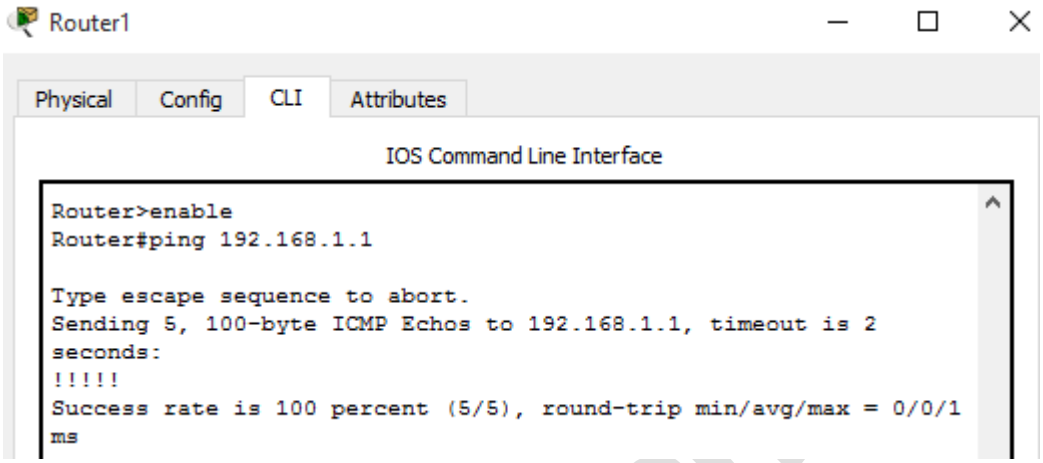
Router#ping 192.168.1.2



8. Select the Router1 and ping it with the IP address of the Router0 (192.168.1.1).

   Router>enable

   Router#ping 192.168.1.1



9. Configure the border gateway protocol for both the Routers using the commands shown. Set the Autonomous System Number of the Router0 and the Router1 as 65001 and 65002 respectively. An autonomous system (AS) is a collection of connected Internet Protocol (IP) routing prefixes under the control of one or more network operators on behalf of a single administrative entity or domain that presents a common, clearly defined routing policy to the Internet. A unique Autonomous System Number is allocated to each Autonomous System and they are important because they uniquely identify each network on the Internet.

   Router0

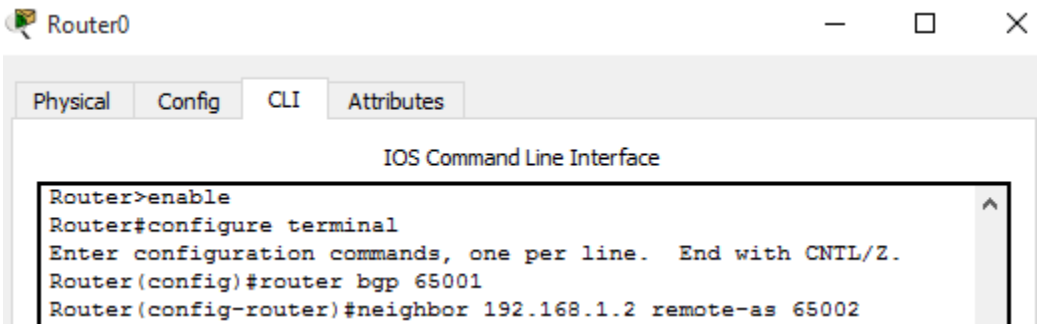
   Router>enable

   Router#configure terminal

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

   Router(config)#router bgp 65001

   Router(config-router)#neighbor 192.168.1.2 remote-as 65002



Router1

Router>enable

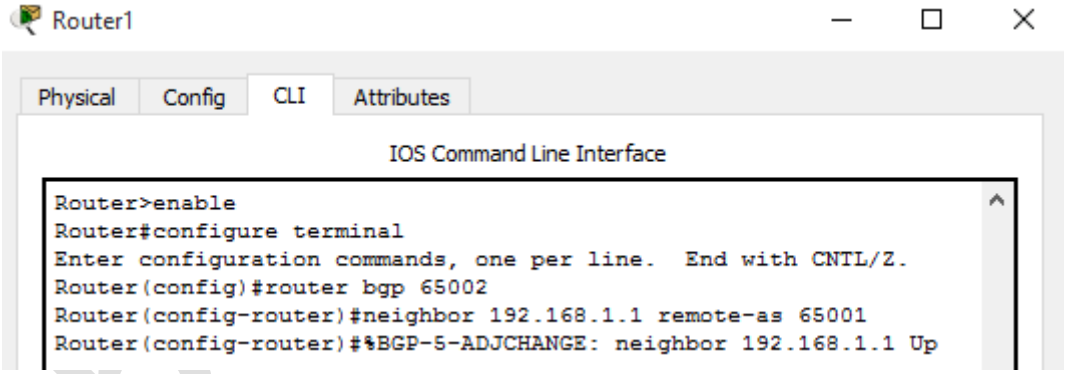
Router#configure terminal

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

Router(config)#router bgp 65002

Router(config-router)#neighbor 192.168.1.1 remote-as 65001

Router(config-router)#%BGP-5-ADJCHANGE: neighbor 192.168.1.1 Up



Router0

%BGP-5-ADJCHANGE: neighbor 192.168.1.2 Up

%BGP-5-ADJCHANGE: neighbor 192.168.1.2 Up

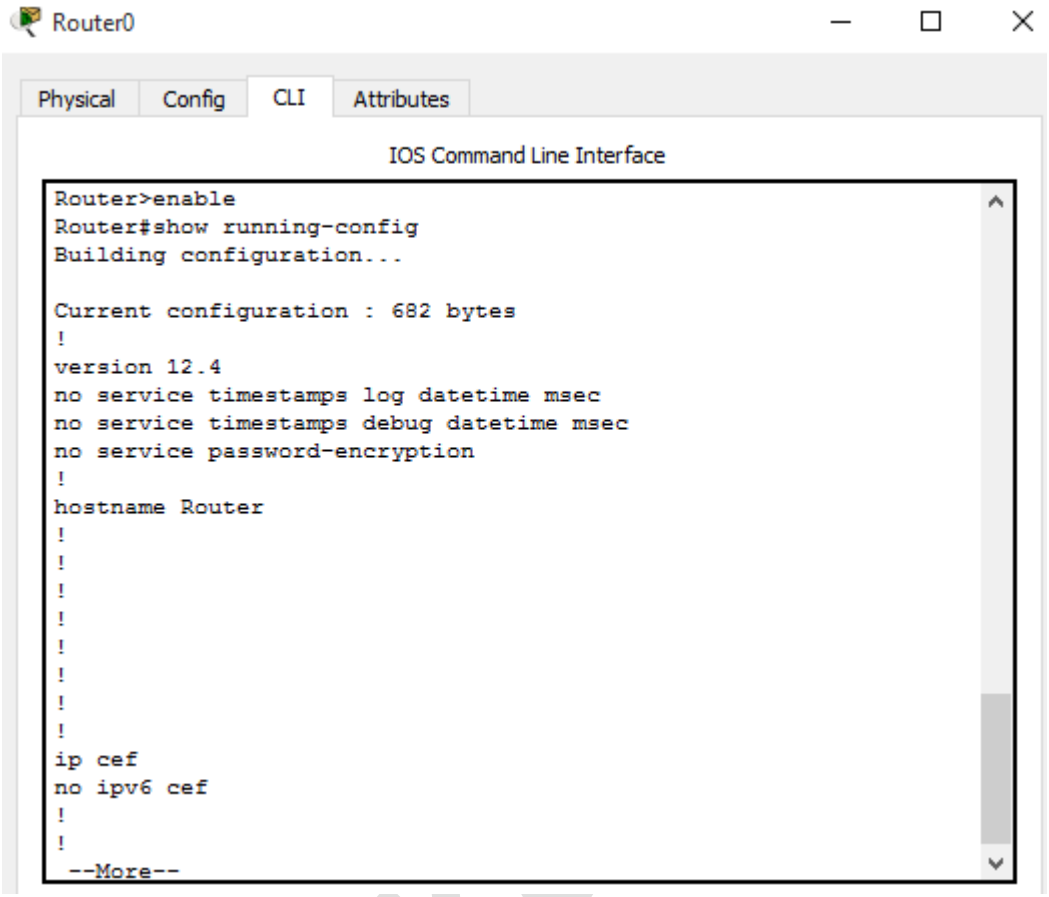
10. Test the connection by pinging as in step 6.
11. Check the Routers' Configuration via the Command Line Interface.

    Router>enable

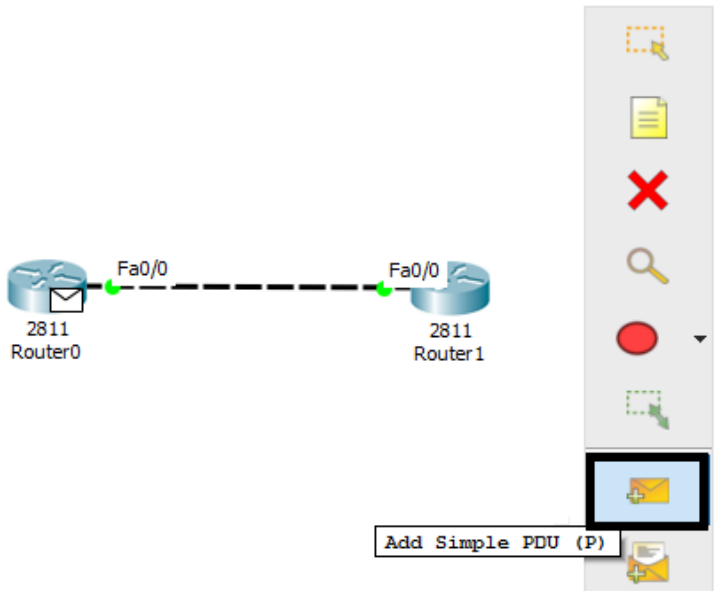
    Router#show running-config

    Building configuration...

```
Current configuration : 682 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
 --More—
```



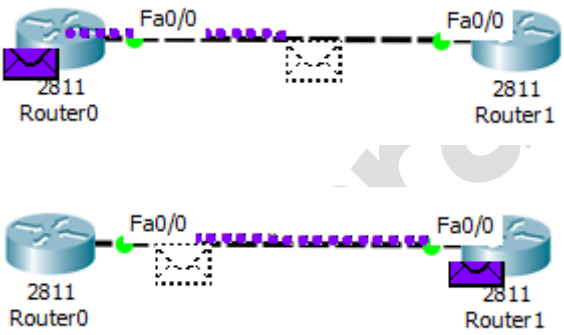
12. Send a Protocol Data Unit (PDU) from the Router0 to the Router1 and from the Router1 to the Router0 to test the connection by clicking on “Add Simple PDU” or pressing “P” then clicking on the first Router followed by clicking on the next Router. Press Ctrl+Shift+O to toggle the PDU list window and view the Fire Status.

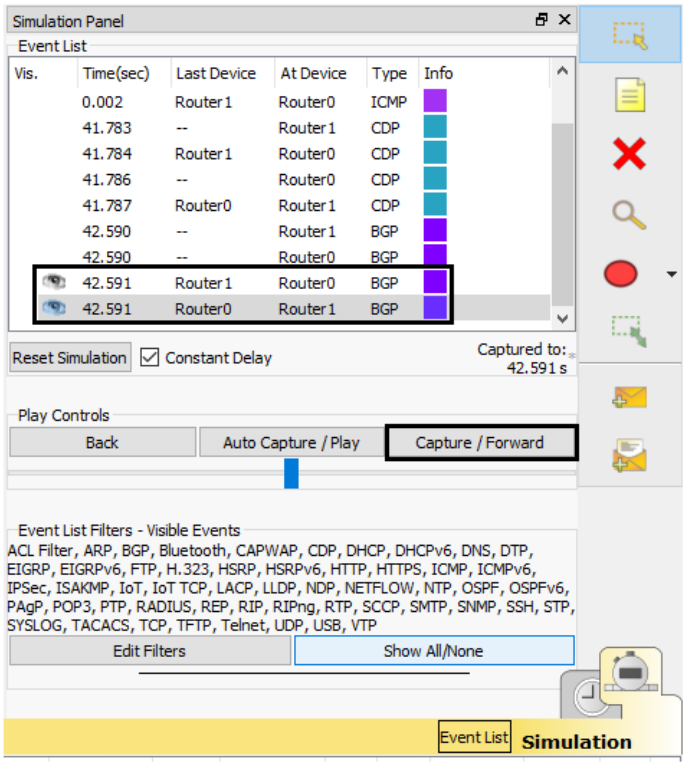


PDU List Window

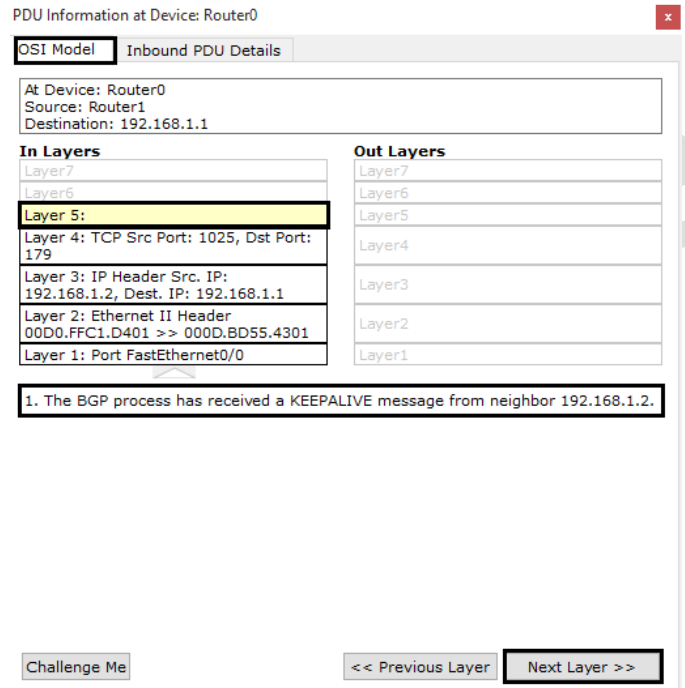
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Router0	Router1	ICMP		0.000	N	0	(edit)	(delete)
	Successful	Router1	Router0	ICMP		0.000	N	1	(edit)	(delete)

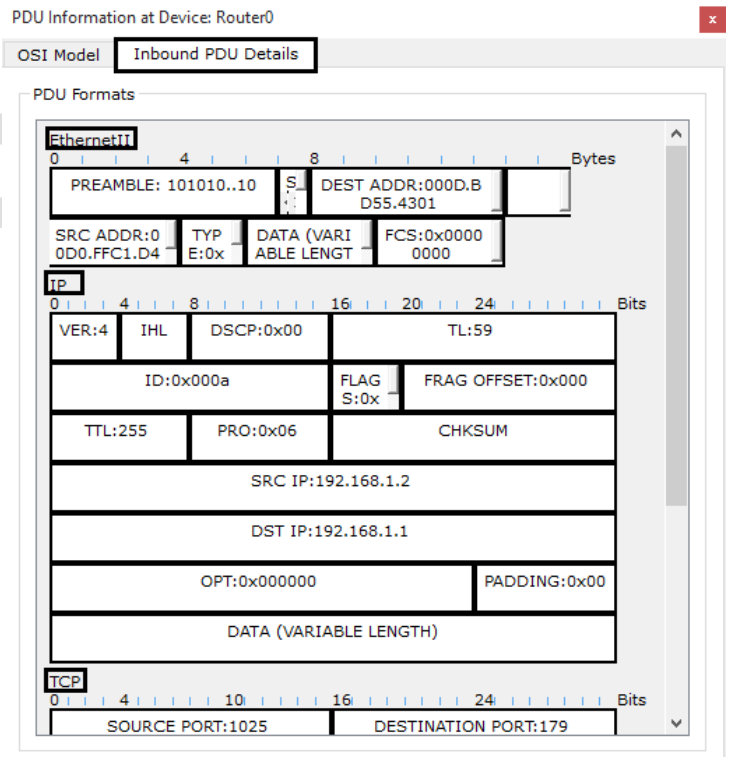
13. Press Ctrl+Shift+D to Delete the Scenario and all PDUs. Press Shift+S to enter into the Simulation Mode. Press “P” to Add a Simple PDU. Click on the Router0 then click on the Router1. Press Alt+C or on the Simulation Panel under the Play Controls click on the Capture/Forward button multiple times until you observe successful implementation of the BGP under the Event List on the Type Column.



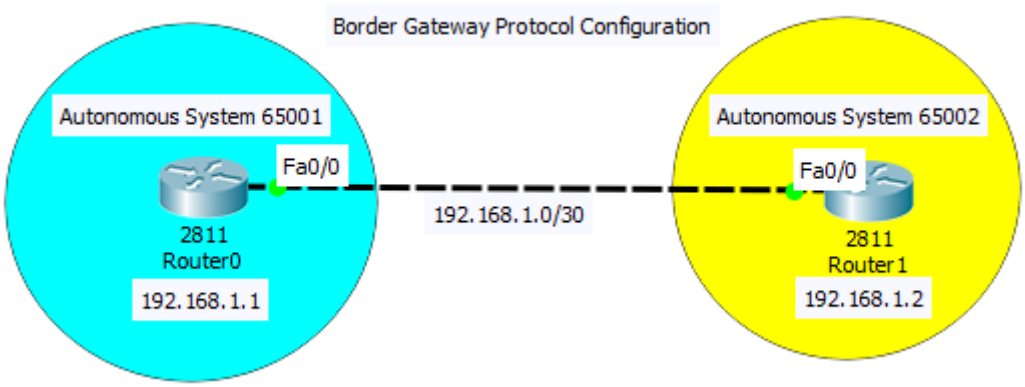


14. Observe the PDU Information at the Device by clicking on the BGP event in the Event List. Under the OSI Model Tab view the “In Layers” model. Click on the Next Layer Button to observe the processes taking place at each layer of an event. Under the Inbound PDU Details tab you may observe the PDU Formats i.e. EthernetII, IP and (Transmission Control Protocol) TCP.





SAMPLE OUTPUT



RESULT

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