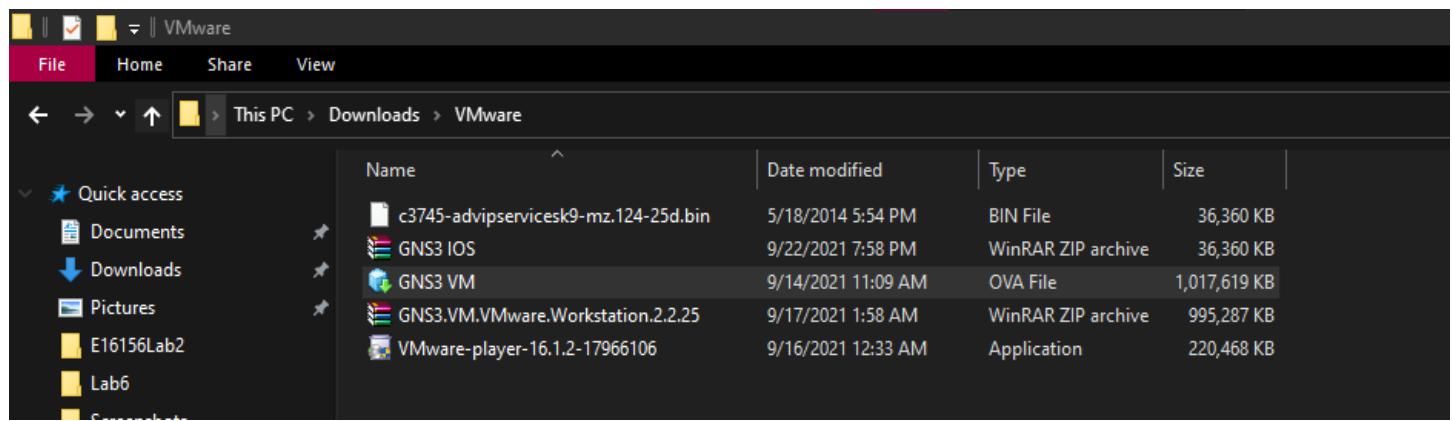


CO513 - Lab 06

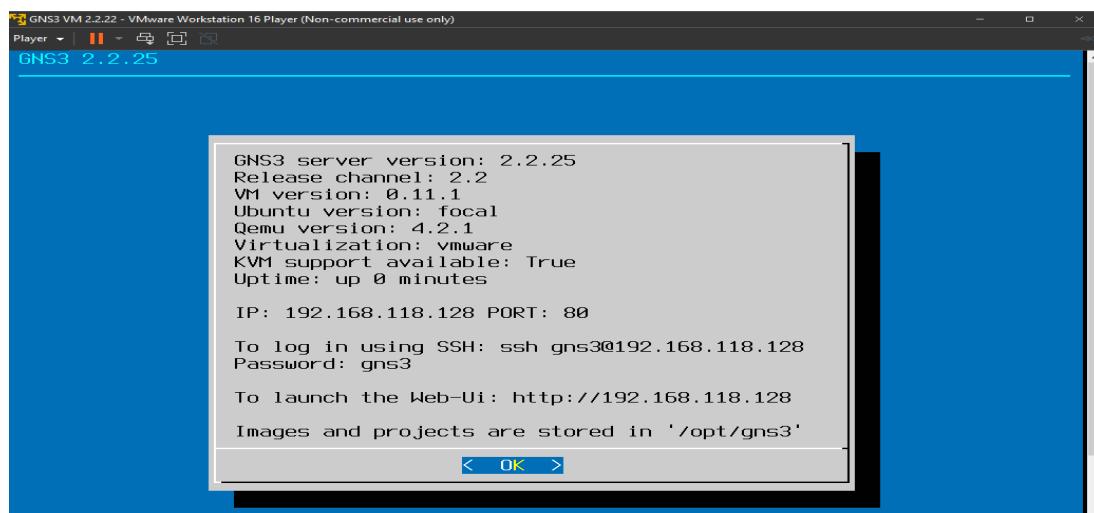
Multiprotocol Label Switching - MPLS

All the screenshots for the lab task from step 01 to 11

Step 01



Step 02



Step 03

The screenshot shows the GNS3 Web UI interface. At the top, there are several tabs: MEGA, E16156_Lab06, copy running config, simple cisco command, Cisco Commands Cheatsheet, GNS3 Web UI, and a plus sign for new tabs. The main area is titled 'Servers' and contains a 'Projects' section with buttons for 'Go to system status', 'Go to preferences', 'Add blank project', and 'Import project'. Below this is a search bar labeled 'Search by name'. A table lists a single project named 'E16156_Lab06' with an edit icon (pencil) and a delete icon (trash can).

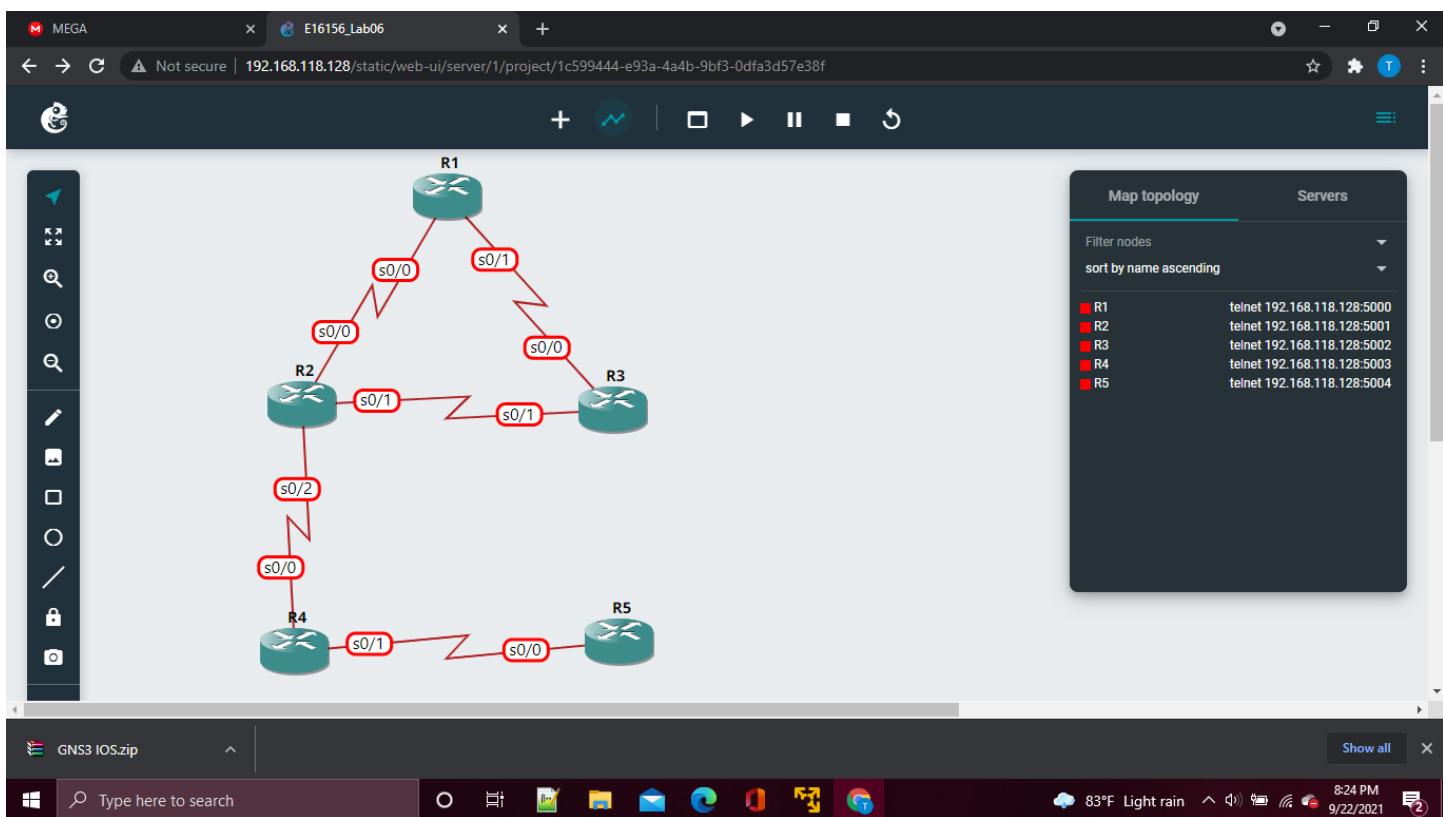
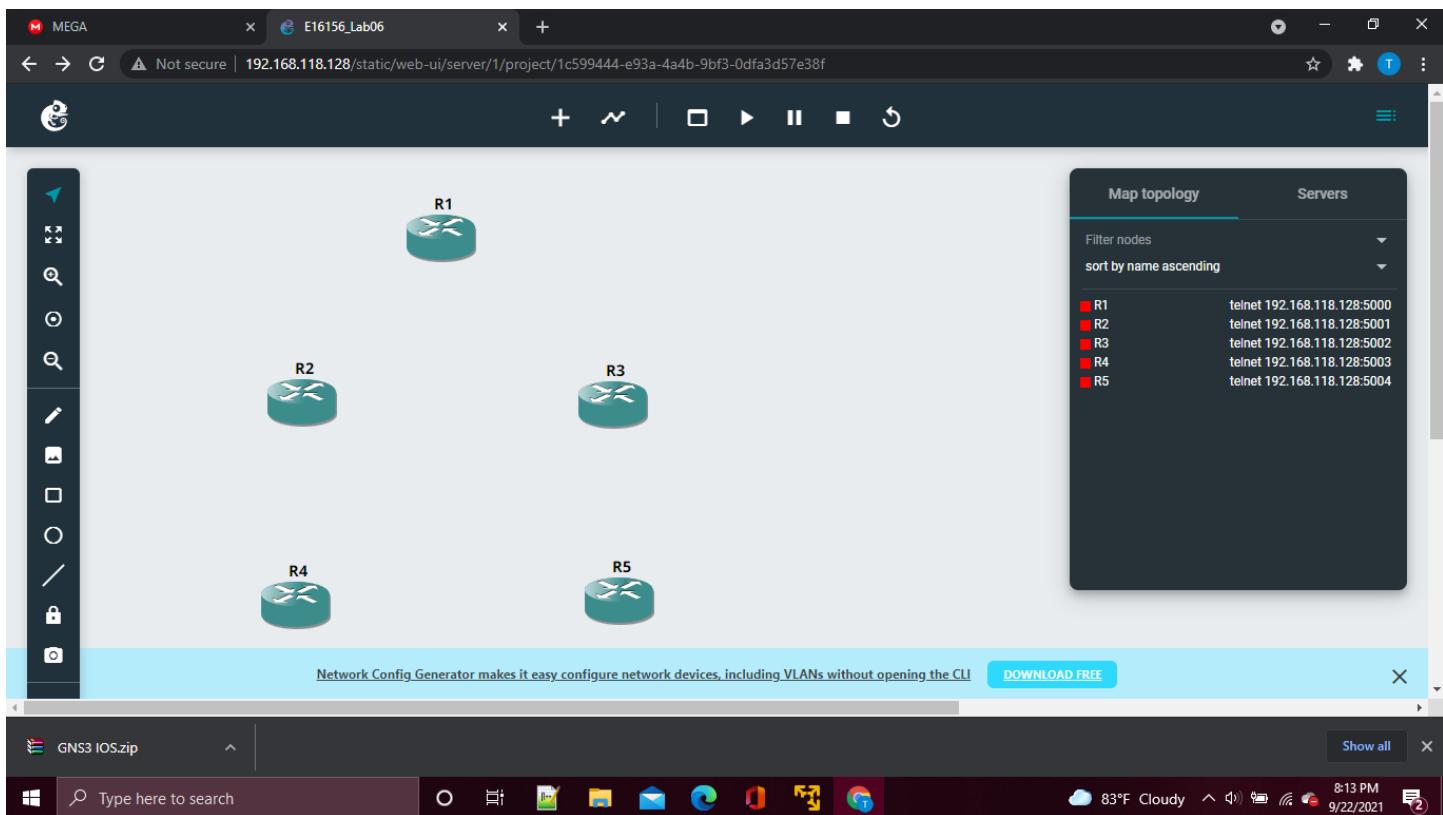
Step 04

The screenshot shows the GNS3 Web UI interface with a network topology. On the left, there is a toolbar with icons for creating nodes, connections, and other functions. The main workspace contains four router nodes labeled R1, R2, R3, and R4. A context menu is open over R1, showing options like 'Open dialog to configure', 'Search by name', and 'Filter templates by type'. This menu also includes icons for ATM switch, Cloud, Ethernet hub, Ethernet switch, Frame Relay switch, NAT, VPCS, and c3745. To the right of the workspace is a sidebar titled 'Map topology' which lists nodes and their telnet addresses. The sidebar includes a 'Filter nodes' dropdown, a 'sort by name ascending' dropdown, and a table with the following data:

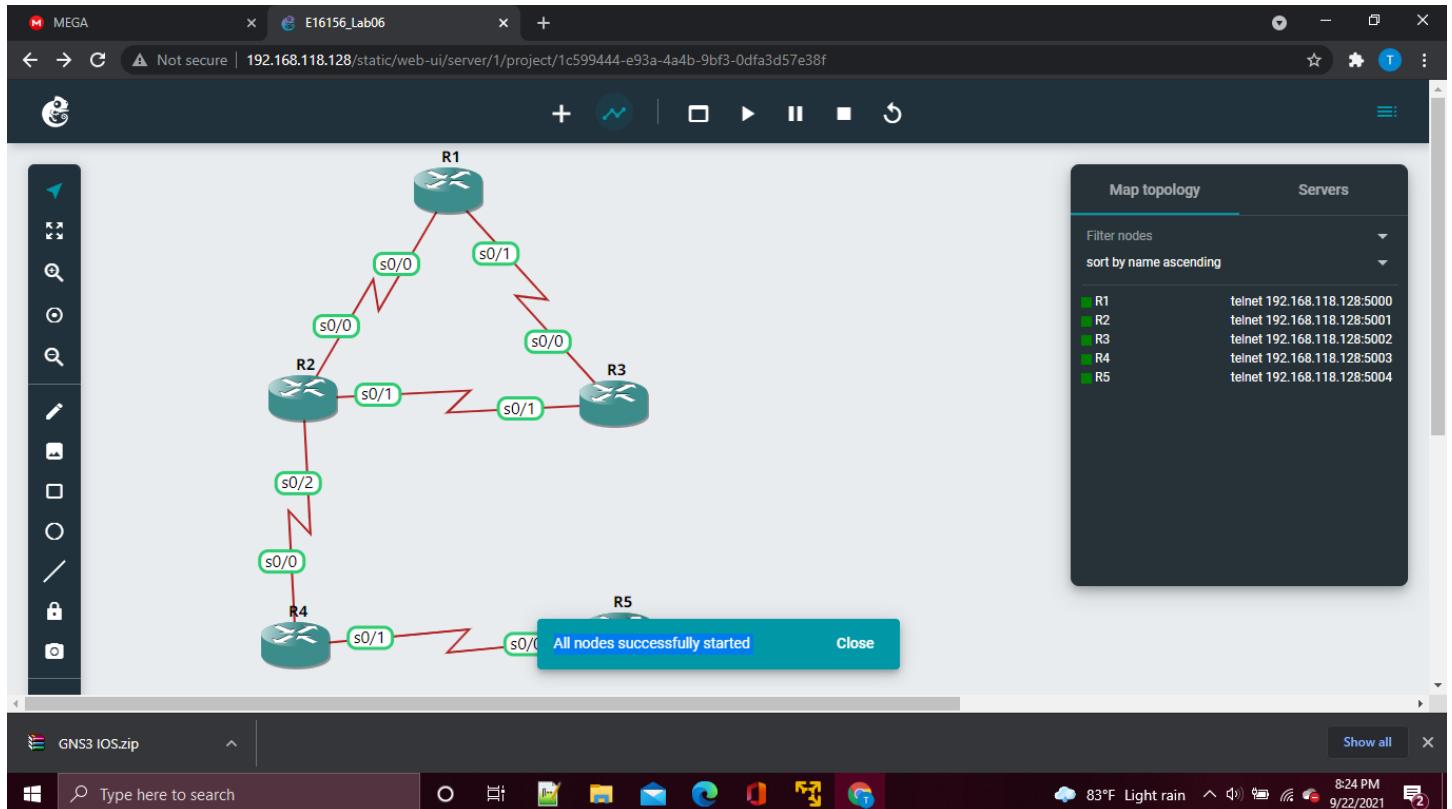
Node	Telnet Address
R1	telnet 192.168.118.128:5000
R2	telnet 192.168.118.128:5001
R3	telnet 192.168.118.128:5002
R4	telnet 192.168.118.128:5003
R5	telnet 192.168.118.128:5004

At the bottom of the interface, there is a banner for 'Network Config Generator' with a download link. The taskbar at the bottom of the screen shows the Windows Start button, a search bar with 'Type here to search', and various pinned application icons. The system tray shows the date and time as 9/22/2021 8:13 PM.

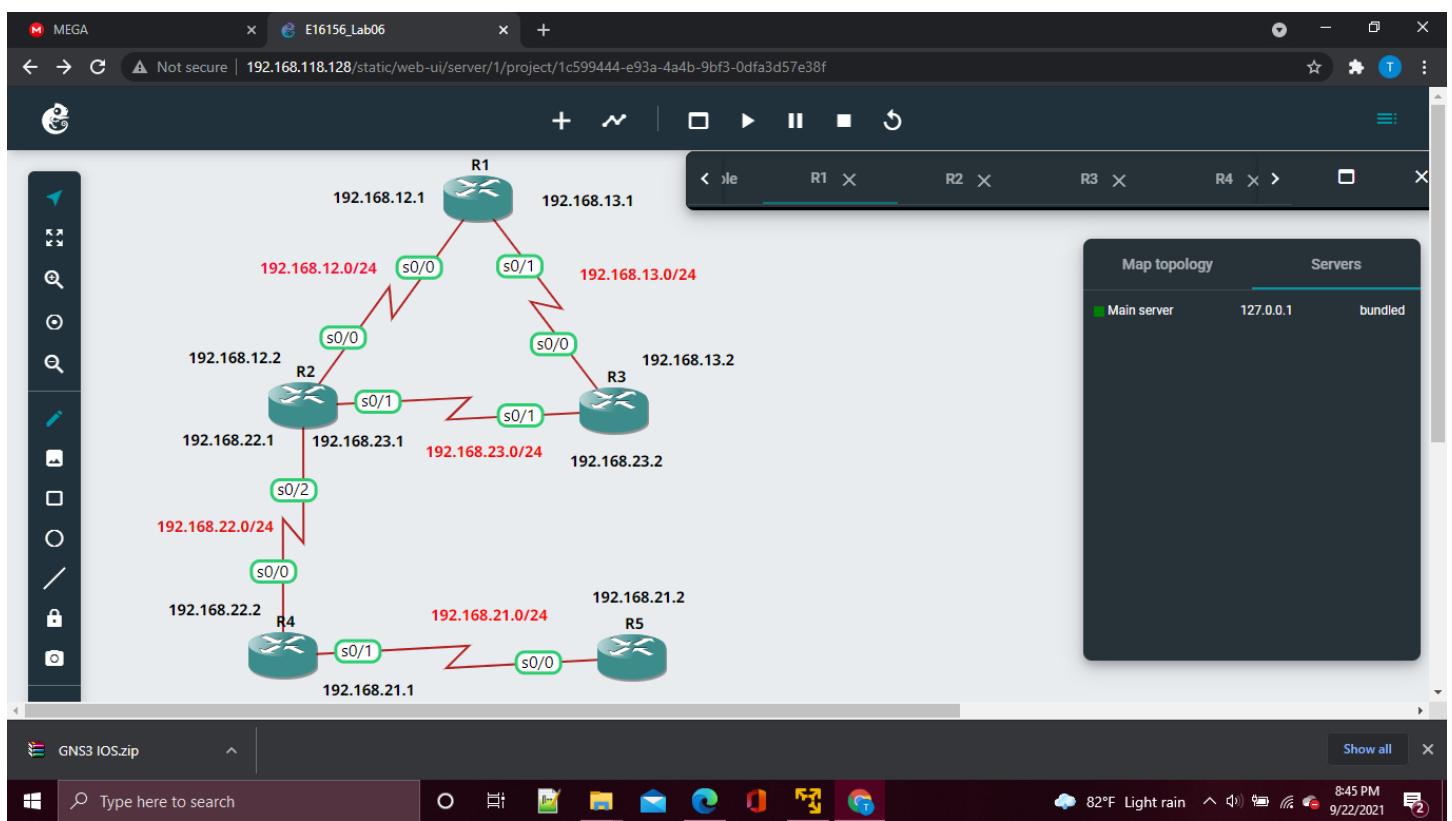
Step 05



Step 06

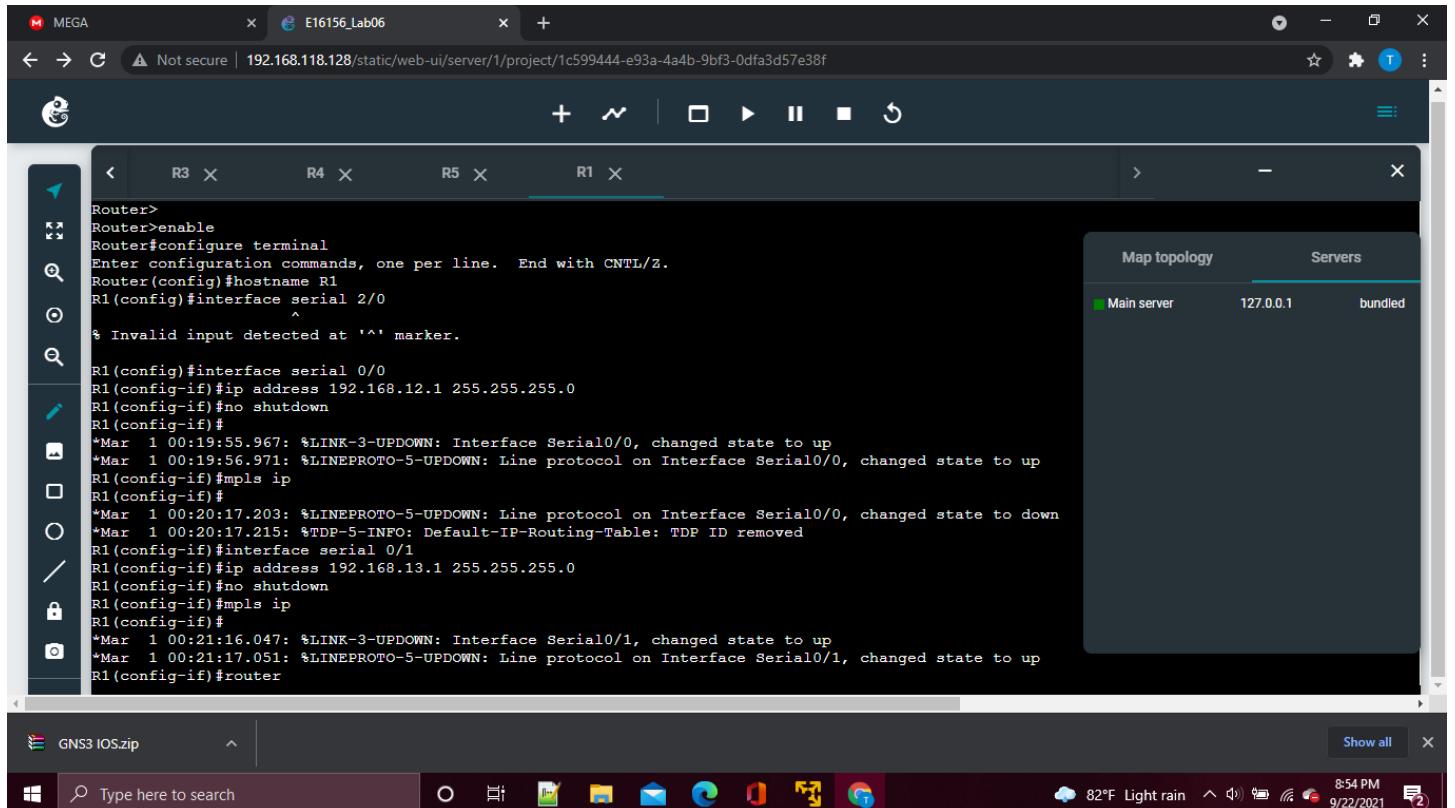


Step 07



Step 08 / Step 09 / Step 10

Router 1

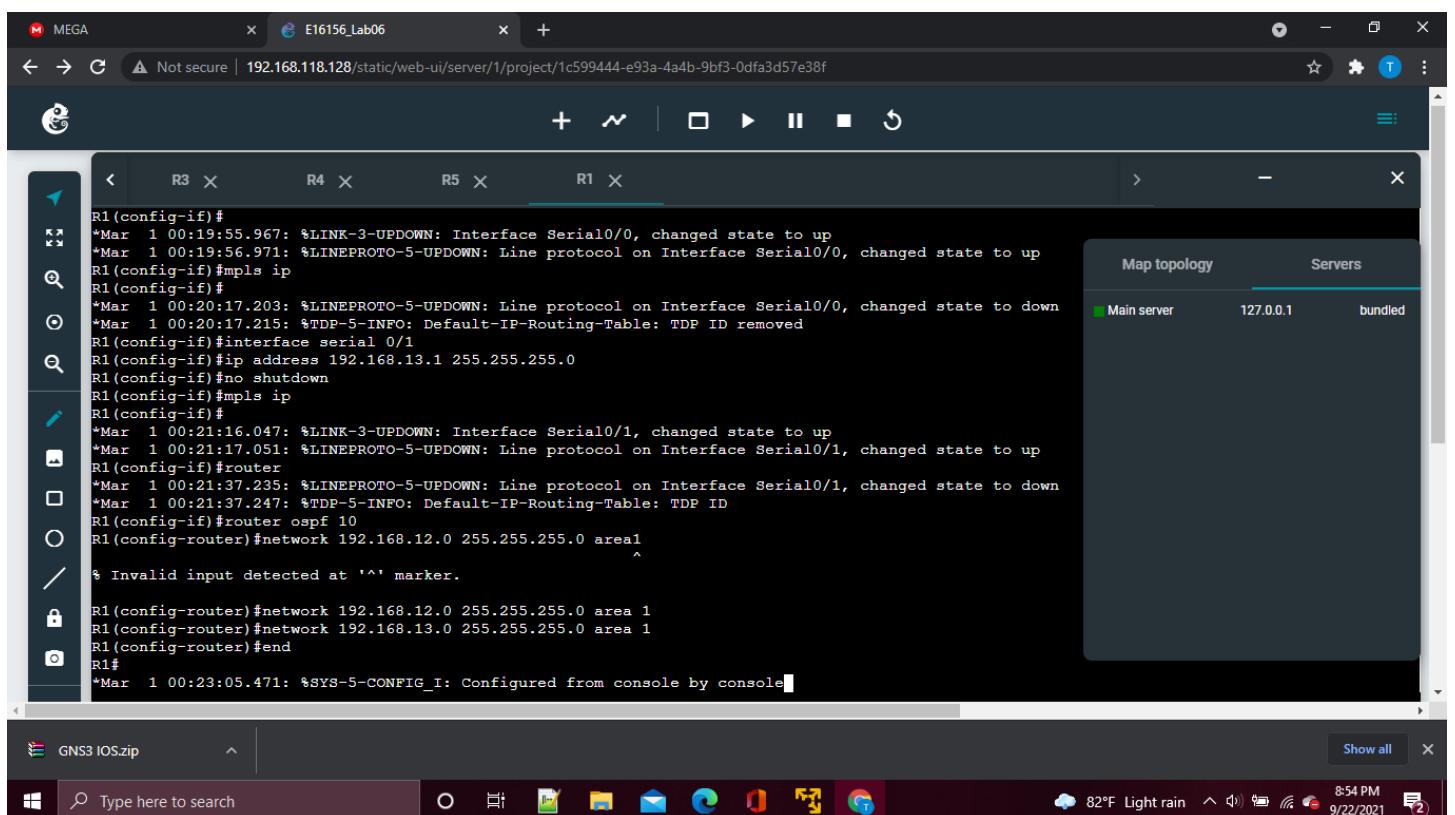


```
R3 X R4 X R5 X R1 X
Router>
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#interface serial 2/0
^
% Invalid input detected at '^' marker.

R1(config)#interface serial 0/0
R1(config-if)#ip address 192.168.12.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
*Mar 1 00:19:55.967: %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
*Mar 1 00:19:56.971: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
R1(config-if)#mpls ip
R1(config-if)#
*Mar 1 00:20:17.203: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to down
*Mar 1 00:20:17.215: %TDP-5-INFO: Default-IP-Routing-Table: TDP ID removed
R1(config-if)#interface serial 0/1
R1(config-if)#ip address 192.168.13.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#mpls ip
R1(config-if)#
*Mar 1 00:21:16.047: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
*Mar 1 00:21:17.051: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up
R1(config-if)#router ospf 10
R1(config-router)#network 192.168.12.0 255.255.255.0 area 1
^
% Invalid input detected at '^' marker.

R1(config-router)#network 192.168.12.0 255.255.255.0 area 1
R1(config-router)#network 192.168.13.0 255.255.255.0 area 1
R1(config-router)#end
R1#
*Mar 1 00:23:05.471: %SYS-5-CONFIG_I: Configured from console by console
```

Map topology Servers
Main server 127.0.0.1 bundled



```
R1(config-if)#
*Mar 1 00:19:55.967: %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
*Mar 1 00:19:56.971: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
R1(config-if)#mpls ip
R1(config-if)#
*Mar 1 00:20:17.203: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to down
*Mar 1 00:20:17.215: %TDP-5-INFO: Default-IP-Routing-Table: TDP ID removed
R1(config-if)#interface serial 0/1
R1(config-if)#ip address 192.168.13.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#mpls ip
R1(config-if)#
*Mar 1 00:21:16.047: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
*Mar 1 00:21:17.051: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up
R1(config-if)#router ospf 10
R1(config-router)#network 192.168.12.0 255.255.255.0 area 1
^
% Invalid input detected at '^' marker.

R1(config-router)#network 192.168.12.0 255.255.255.0 area 1
R1(config-router)#network 192.168.13.0 255.255.255.0 area 1
R1(config-router)#end
R1#
*Mar 1 00:23:05.471: %SYS-5-CONFIG_I: Configured from console by console
```

Map topology Servers
Main server 127.0.0.1 bundled

Router 2

```
Router>
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
R2(config)#ip cef
R2(config)#interface serial 0/0
R2(config-if)#ip address 192.168.12.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#
*Mar 1 00:37:04.899: %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
*Mar 1 00:37:05.903: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
R2(config-if)#mpls ip
R2(config-if)#
*Mar 1 00:37:18.599: %LDP-5-NBRCHG: LDP Neighbor 192.168.12.1:0 (1) is UP
R2(config-if)#interface serial 0/1
R2(config-if)#ip address 192.168.23.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#mpls ip
R2(config-if)#
*Mar 1 00:38:35.015: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
*Mar 1 00:38:36.019: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up
R2(config-if)#interface serial 0/2
R2(config-if)#
*Mar 1 00:39:00.487: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to down
```

R2(config-if)#ip address 192.168.23.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#mpls ip
R2(config-if)#
*Mar 1 00:38:35.015: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
*Mar 1 00:38:36.019: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up
R2(config-if)#interface serial 0/2
R2(config-if)#
*Mar 1 00:39:00.487: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to down
R2(config-if)#ip address 192.168.22.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#mpls ip
*Mar 1 00:39:22.011: %LINK-3-UPDOWN: Interface Serial0/2, changed state to up
R2(config-if)#
*Mar 1 00:39:23.015: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2, changed state to up
R2(config-if)#router ospf 10
R2(config-router)#network 192.168
*Mar 1 00:39:50.519: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2, change
R2(config-router)#network 192.168.12.0 255.255.255.0 area 1
R2(config-router)#network 192.168.12.0 255.255.255.0 area 1
*Mar 1 00:40:30.763: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.13.1 on Serial0/0 from LOADING to FULL, Load
R2(config-router)#network 192.168.23.0 255.255.255.0 area 1
R2(config-router)#network 192.168.22.0 255.255.255.0 area 1
R2(config-router)#end
R2#
*Mar 1 00:41:01.887: %SYS-5-CONFIG_I: Configured from console by console
R2#

Map topology Servers
Main server 127.0.0.1 bundled

MEGA E16156_Lab06 copy running config command simple cisco commands - Go Cisco Commands Cheat Sheet

Not secure | 192.168.118.128/static/web-ui/server/1/project/1c599444-e93a-4a4b-9bf3-0dfa3d57e38f

GNS3 console R2 X R3 X R4 X R5 X R1 X

```
*Mar 1 00:38:35.015: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
*Mar 1 00:38:36.019: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up
R2(config-if)#interface serial 0/2
R2(config-if)#
*Mar 1 00:39:00.487: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to down
R2(config-if)#ip address 192.168.22.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#mpls ip
*Mar 1 00:39:22.011: %LINK-3-UPDOWN: Interface Serial0/2, changed state to up
R2(config-if)#
*Mar 1 00:39:23.015: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2, changed state to up
R2(config-if)#router ospf 10
R2(config-router)#network 192.168
*Mar 1 00:39:50.519: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2, change
R2(config-router)#network 192.168.12.0 255.255.255.0 area 1
R2(config-router)#network 192.168.12.0 255.255.255.0 area 1
*Mar 1 00:40:30.763: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.13.1 on Serial0/0 from LOADING to FULL, Load
R2(config-router)#network 192.168.23.0 255.255.255.0 area 1
R2(config-router)#network 192.168.22.0 255.255.255.0 area 1
R2(config-router)#end
R2#
*Mar 1 00:41:01.887: %SYS-5-CONFIG_I: Configured from console by console
R2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R2#
```

GNS3 IOS.zip Show all

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Router 3

MEGA E16156_Lab06 copy running config command simple cisco commands - Go Cisco Commands Cheat Sheet

Not secure | 192.168.118.128/static/web-ui/server/1/project/1c599444-e93a-4a4b-9bf3-0dfa3d57e38f

GNS3 console R2 X R3 X R4 X R5 X R1 X

```
*Mar 1 00:31:46.179: %SYS-5-CONFIG_I: Configured from console by console
Router>
Router>enable
Router>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R4
R4(config)#ip cef
R4(config)#interface serial 0/0
R4(config-if)#ip address 192.168.22.2 255.255.255.0
^
% Invalid input detected at '^' marker.

R4(config-if)#ip address 192.168.22.2 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#mpls ip
R4(config-if)#
*Mar 1 00:49:15.167: %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
*Mar 1 00:49:16.239: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
R4(config-if)#
R4(config-if)#interface serial 0/1
R4(config-if)#ip address 192.168.21.1 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#mpls ip
R4(config-if)#
*Mar 1 00:49:43.135: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
R4(config-if)#
R4#
```

GNS3 IOS.zip Show all

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MEGA E16156_Lab06 copy running config command simple cisco commands - Go Cisco Commands Cheat Sheet

Not secure | 192.168.118.128/static/web-ui/server/1/project/1c599444-e93a-4a4b-9bf3-0dfa3d57e38f

GNS3 console R2 X R3 X R4 X R5 X R1 X

```
R3(config-if)#mpls ip
R3(config-if)#interface serial 0/1
R3(config-if)#ip address 192.168.23.2 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#mpls ip
R3(config-if)#
*Mar 1 00:45:18.563: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
*Mar 1 00:45:19.567: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up
R3(config-if)#
R3(config-if)#router ospf 10
R3(config-router)#network 192.168.13.0 255.255.255.0 area 1
R3(config-router)#network 192.168.13.0 255.255.255.0 area 1
*Mar 1 00:46:22.083: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.13.1 on Serial0/0 from LOADING to FULL, Load
R3(config-router)#network 192.168.13.0 255.255.255.0 area 1
*Mar 1 00:46:27.227: %LDP-5-NBRCHG: LDP Neighbor 192.168.12.1:0 (1) is UP
*Mar 1 00:46:27.247: %LDP-5-NBRCHG: LDP Neighbor 192.16
R3(config-router)#network 192.168.23.0 255.255.255.0 area 1
R3(config-router)#
*Mar 1 00:46:48.699: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.23.1 on Serial0/1 from LOADING to FULL, Load
R3(config-router)#end
R3#
*Mar 1 00:46:57.539: %SYS-5-CONFIG_I: Configured from console by console
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R3#
```

GNS3 IOS.zip Show all

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Router 4

MEGA E16156_Lab06 copy running config command simple cisco commands - Go Cisco Commands Cheat Sheet

Not secure | 192.168.118.128/static/web-ui/server/1/project/1c599444-e93a-4a4b-9bf3-0dfa3d57e38f

GNS3 console R2 X R3 X R4 X R5 X R1 X

```
*Mar 1 00:31:46.179: %SYS-5-CONFIG_I: Configured from console by console
Router>
Router>enable
Router>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R4
R4(config)#ip cef
R4(config)#interface serial 0/0
R4(config-if)#ip address 192.168.22.2 255.255.255.0
^
% Invalid input detected at '^' marker.

R4(config-if)#ip address 192.168.22.2 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#mpls ip
R4(config-if)#
*Mar 1 00:49:15.167: %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
*Mar 1 00:49:16.239: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
R4(config-if)#
R4(config-if)#interface serial 0/1
R4(config-if)#ip address 192.168.21.1 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#mpls ip
R4(config-if)#
*Mar 1 00:49:43.135: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
R4(config-if)#
R4#
```

GNS3 IOS.zip Show all

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MEGA E16156_Lab06 copy running config command simple cisco commands - Go Cisco Commands Cheat Sheet

Not secure | 192.168.118.128/static/web-ui/server/1/project/1c599444-e93a-4a4b-9bf3-0dfa3d57e38f

GNS3 console R2 X R3 X R4 X R5 X R1 X

```
*Mar 1 00:49:16.239: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
R4(config-if)#
R4(config-if)#interface serial 0/1
R4(config-if)#ip address 192.168.21.1 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#mpls ip
R4(config-if)#
*Mar 1 00:49:43.135: %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
R4(config-if)#
*Mar 1 00:49:44.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up
R4(config-if)#router ospf 10
R4(config-router)#network 192.168.22.0 25
*Mar 1 00:50:10.371: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1
R4(config-router)#network 192.168.22.0 255.255.255.0 area 1
R4(config-router)#
*Mar 1 00:50:40.955: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.23.1 on Serial0/0 from LOADING to FULL, Load
*Mar 1 00:50:46.067: %LDP-5-NBRCHG: LDP Neighbor 192.168.12.2:0 (1) is UP
R4(config-router)#network 192.168.21.0 255.255.255.0 area 1
R4(config-router)#end
R4#
R4#
*Mar 1 00:51:27.427: %SYS-5-CONFIG_I: Configured from console by console
R4#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R4#
```

GNS3 IOS.zip Show all

Type here to search 82°F Light rain 9:17 PM 9/22/2021

Router 5

MEGA E16156_Lab06 copy running config command simple cisco commands - Go Cisco Commands Cheat Sheet

Not secure | 192.168.118.128/static/web-ui/server/1/project/1c599444-e93a-4a4b-9bf3-0dfa3d57e38f

GNS3 console R2 X R3 X R4 X R5 X R1 X

```
Router>
Router>enable
Router>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R5
R5(config)#ip cef
R5(config)#interface serial 0/0
R5(config-if)#ip address 192.168.21.2 255.255.255.0
R5(config-if)#no shutdown
R5(config-if)#
*Mar 1 00:53:41.139: %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
*Mar 1 00:53:42.143: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
R5(config-if)#mpls ip
R5(config-if)#
R5(config-if)#router ospf 10
R5(config-router)#network 192.168.21.0 255.255.255.0 area 1
R5(config-router)#
*Mar 1 00:54:21.595: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.22.2 on Serial0/0 from LOADING to FULL, Load
R5(config-router)#end
R5#
*Mar 1 00:54:28.059: %LDP-5-NBRCHG: LDP Neighbor 192.168.22.2:0 (1) is UP
*Mar 1 00:54:28.839: %SYS-5-CONFIG_I: Configured from console by console
R5#
R5#copy running-config startup-config
Destination filename [startup-config]?
%Error opening flash:running-config (No device available)
R5#
```

GNS3 IOS.zip Show all

Type here to search 82°F Light rain 9:20 PM 9/22/2021

Step 11

a. show ip route

Router 1

Use this command to view the IP routes configured for an IAP. The output of show ip route displays the entries in the routing table, as well as the means by which they were determined (directly connected network, static route, or which routing protocol was used to select the route).

It also displays the Gateway of last resort, sometimes called the default Gateway, if one is configured. This is a static route configured by the user that routes IP address 0.0.0.0. (all destinations) through a single host (the Gateway). The effect of setting a gateway is that if no routing table entry exists for a destination address, packets destined for that address will be forwarded to the Gateway router.

The screenshot shows a web browser window with multiple tabs open. The active tab is titled 'GNS3 console' and displays the terminal session for Router 1 (R1). The session shows the configuration mode command 'R1>show running-config' followed by an error message: '% Invalid input detected at '^' marker.' Below this, the command 'R1>show ip route' is run twice, once for destination 192.168.22.2 and once for 192.168.21.2. Both commands output detailed routing information including OSPF protocol details, last update times, and routing descriptor blocks. The browser interface includes a toolbar at the top and a sidebar on the right showing a 'Map topology' and 'Servers' section. The operating system taskbar at the bottom shows a file named 'GNS3 IOS.zip' and various system icons.

```
R1>
R1>
R1>show running-config
^
% Invalid input detected at '^' marker.

R1>
R1>
R1>
R1>
R1>show ip route 192.168.22.2
Routing entry for 192.168.22.0/24
  Known via "ospf 10", distance 110, metric 128, type intra area
  Last update from 192.168.12.2 on Serial0/0, 00:04:57 ago
  Routing Descriptor Blocks:
    * 192.168.12.2, from 192.168.23.1, 00:04:57 ago, via Serial0/0
      Route metric is 128, traffic share count is 1

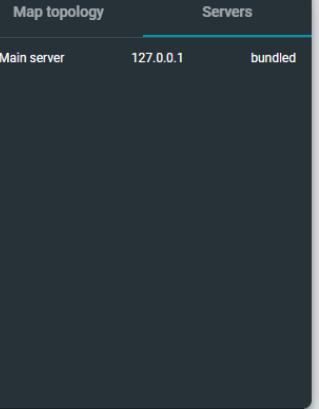
R1>show ip route 192.168.21.2
Routing entry for 192.168.21.0/24
  Known via "ospf 10", distance 110, metric 192, type intra area
  Last update from 192.168.12.2 on Serial0/0, 00:05:12 ago
  Routing Descriptor Blocks:
    * 192.168.12.2, from 192.168.22.2, 00:05:12 ago, via Serial0/0
      Route metric is 192, traffic share count is 1
```

Router 2

R2>
R2>
R2>
R2>show ip route 192.168.21.2
Routing entry for 192.168.21.0/24
Known via "ospf 10", distance 110, metric 128, type intra area
Last update from 192.168.22.2 on Serial0/2, 00:05:48 ago
Routing Descriptor Blocks:
* 192.168.22.2, from 192.168.22.2, 00:05:48 ago, via Serial0/2
 Route metric is 128, traffic share count is 1

R2>show ip route 192.168.13.2
Routing entry for 192.168.13.0/24
Known via "ospf 10", distance 110, metric 128, type intra area
Last update from 192.168.12.1 on Serial0/0, 00:05:59 ago
Routing Descriptor Blocks:
 192.168.23.2, from 192.168.23.2, 00:05:59 ago, via Serial0/1
 Route metric is 128, traffic share count is 1
* 192.168.12.1, from 192.168.13.1, 00:05:59 ago, via Serial0/0
 Route metric is 128, traffic share count is 1

R2>

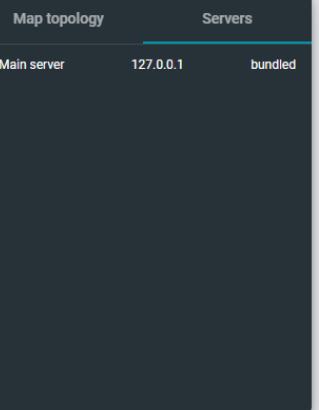


Router 3

R3>
R3>
R3>
R3>show ip route 192.168.21.1
Routing entry for 192.168.21.0/24
Known via "ospf 10", distance 110, metric 192, type intra area
Last update from 192.168.23.1 on Serial0/1, 00:06:24 ago
Routing Descriptor Blocks:
* 192.168.23.1, from 192.168.22.2, 00:06:24 ago, via Serial0/1
 Route metric is 192, traffic share count is 1

R3>show ip route 192.168.21.2
Routing entry for 192.168.21.0/24
Known via "ospf 10", distance 110, metric 192, type intra area
Last update from 192.168.23.1 on Serial0/1, 00:06:31 ago
Routing Descriptor Blocks:
* 192.168.23.1, from 192.168.22.2, 00:06:31 ago, via Serial0/1
 Route metric is 192, traffic share count is 1

R3>



Router 4

The screenshot shows a web browser window with multiple tabs open. The active tab is titled 'GNS3 console' and displays a terminal session for Router 4 (R4). The terminal output shows the configuration process starting with 'Destination filename [startup-config]?'. It then lists several log messages from Mar 1, 00:53:40.371 to Mar 1, 00:54:21.495, including line protocol changes and OSPF neighbor state transitions. Following this, the 'show ip route' command is run twice, once for 192.168.13.1 and once for 192.168.13.0/24, displaying OSPF routes with metrics of 192. A map topology window is visible on the right, showing a single 'Main server' at 127.0.0.1. The taskbar at the bottom shows various icons and the date/time as 9:26 PM 9/22/2021.

```
Destination filename [startup-config]?
Building configuration...
[OK]
R4#
*Mar 1 00:53:40.371: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up
*Mar 1 00:54:21.495: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.21.2 on Serial0/1 from LOADING to FULL, Load
*Mar 1 00:54:27.939: %LDP-5-NBRCHG: LDP Neighbor 192.168.21.2:0 (2) is UP
R4#
R4#
R4#
R4#show ip route 192.168.13.1
Routing entry for 192.168.13.1/24
 Known via "ospf 10", distance 110, metric 192, type intra area
 Last update from 192.168.22.1 on Serial0/0, 00:06:54 ago
 Routing Descriptor Blocks:
 * 192.168.22.1, from 192.168.13.1, 00:06:54 ago, via Serial0/0
   Route metric is 192, traffic share count is 1

R4#show ip route 192.168.13.2
Routing entry for 192.168.13.0/24
 Known via "ospf 10", distance 110, metric 192, type intra area
 Last update from 192.168.22.1 on Serial0/0, 00:07:00 ago
 Routing Descriptor Blocks:
 * 192.168.22.1, from 192.168.13.1, 00:07:00 ago, via Serial0/0
   Route metric is 192, traffic share count is 1

R4#

```

Router 5

The screenshot shows a web browser window with multiple tabs open. The active tab is titled 'GNS3 console' and displays a terminal session for Router 5 (R5). The terminal output shows the configuration process starting with 'Destination filename [startup-config]?'. It then lists several log messages from R5# to R5\$ and a 'show ip route' command for 192.168.13.1, which displays an OSPF route with a metric of 256. Another 'show ip route' command for 192.168.12.1 is also shown. A map topology window is visible on the right, showing a single 'Main server' at 127.0.0.1. The taskbar at the bottom shows various icons and the date/time as 9:27 PM 9/22/2021.

```
R5#
R5#
R5#
R5#
R5#
R5#
R5#
R5#
R5#
R5#show ip route 192.168.13.1
Routing entry for 192.168.13.1/24
 Known via "ospf 10", distance 110, metric 256, type intra area
 Last update from 192.168.21.1 on Serial0/0, 00:07:25 ago
 Routing Descriptor Blocks:
 * 192.168.21.1, from 192.168.13.1, 00:07:25 ago, via Serial0/0
   Route metric is 256, traffic share count is 1

R5#show ip route 192.168.12.1
Routing entry for 192.168.12.0/24
 Known via "ospf 10", distance 110, metric 192, type intra area
 Last update from 192.168.21.1 on Serial0/0, 00:07:33 ago
 Routing Descriptor Blocks:
 * 192.168.21.1, from 192.168.23.1, 00:07:33 ago, via Serial0/0
   Route metric is 192, traffic share count is 1

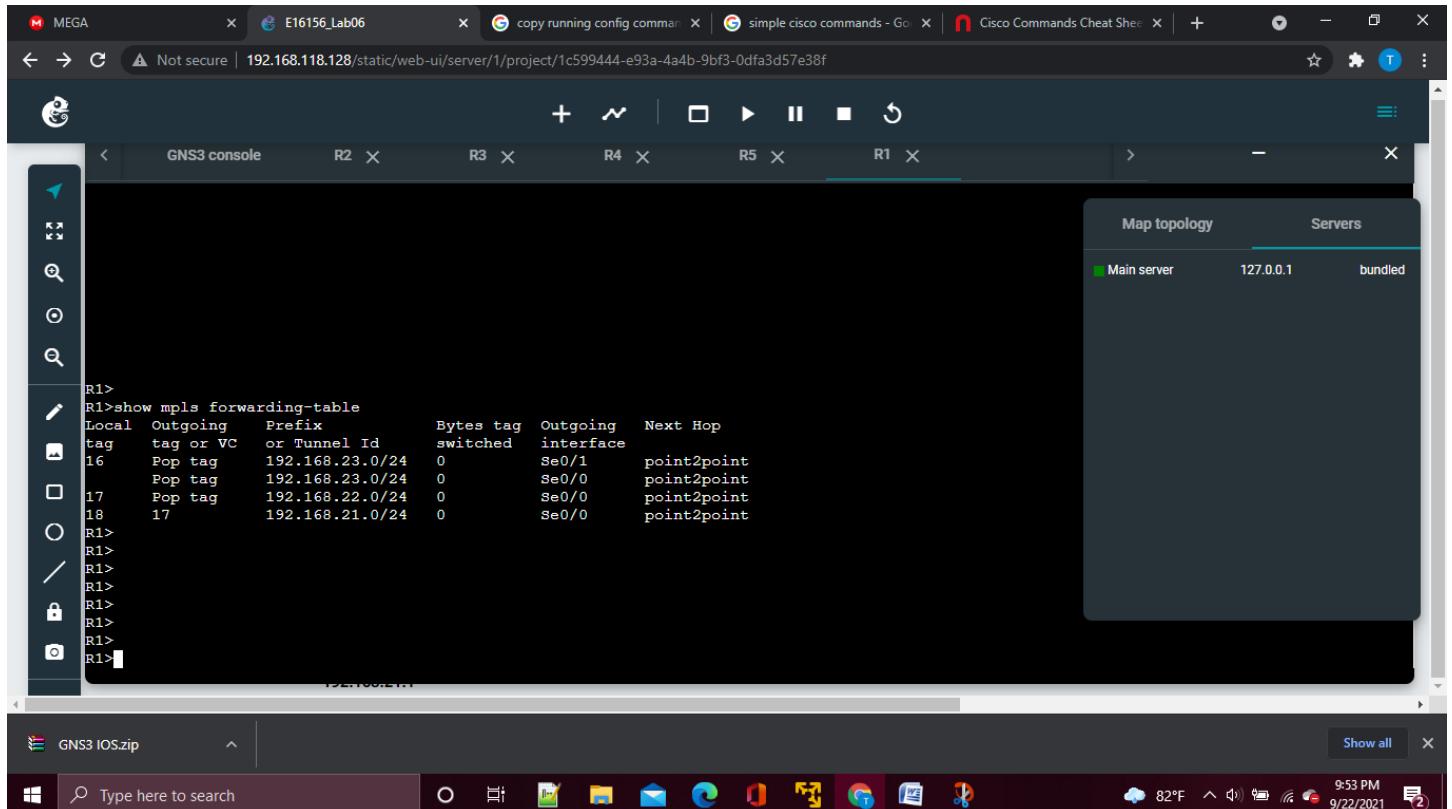
R5#

```

b. show mpls forwarding-table

This command is used to help verify that the routing protocol process has relayed the correction information to the forwarding table. The Routing Engine constructs and maintains one or more routing tables. From the routing tables, the Routing Engine derives a table of active routes, called the forwarding table.

Router 1



The screenshot shows the GNS3 console interface with multiple tabs at the top: MEGA, E16156_Lab06, copy running config commar, simple cisco commands - Go!, Cisco Commands Cheat Sheet, and others. The R1 tab is active. On the left, there's a toolbar with various icons. The main window displays the command output:

```
R1>
R1>show mpls forwarding-table
Local Outgoing Prefix      Bytes tag Outgoing   Next Hop
tag  tag or VC or Tunnel Id switched interface
16   Pop tag   192.168.23.0/24 0    Se0/1     point2point
      Pop tag   192.168.23.0/24 0    Se0/0     point2point
17   Pop tag   192.168.22.0/24 0    Se0/0     point2point
18   17        192.168.21.0/24 0    Se0/0     point2point
```

Router 2

```
R2>
R2>
R2>
R2>show mpls forwarding-table
Local Outgoing      Prefix          Bytes tag  Outgoing      Next Hop
tag   tag or VC    or Tunnel Id    switched
16    Pop tag       192.168.13.0/24 0        Se0/1        point2point
      Pop tag       192.168.13.0/24 0        Se0/0        point2point
17    Pop tag       192.168.21.0/24 0        Se0/2        point2point
R2>
R2>
R2>
R2>
R2>
R2>
```

Router 3

```
R3>
R3>show mpls forwarding-table
Local Outgoing Prefix Bytes tag Outgoing Next Hop
tag tag or VC or Tunnel Id switched interface
16 Pop tag 192.168.12.0/24 0 Se0/1 point2point
    Pop tag 192.168.12.0/24 0 Se0/0 point2point
17 Pop tag 192.168.22.0/24 0 Se0/1 point2point
18 17 192.168.21.0/24 0 Se0/1 point2point
r3>
```

Router 4

The screenshot shows the GNS3 console interface with multiple tabs for routers R2, R3, R4, R5, and R1. The R4 tab is active, displaying the command-line interface (CLI) output:

```
R4>
R4>
R4>
R4>
R4>
R4>show mpls forwarding-table
Local Outgoing Prefix Bytes tag Outgoing Next Hop
tag tag or VC or Tunnel Id switched interface
16 Pop tag 192.168.12.0/24 0 Se0/0 point2point
17 16 192.168.13.0/24 0 Se0/0 point2point
18 Pop tag 192.168.23.0/24 0 Se0/0 point2point
R4>
R4>
R4>
R4>
R4>
R4>
```

To the right of the console is a "Map topology" panel showing a single server node labeled "Main server" at IP 127.0.0.1. The bottom of the screen shows a Windows taskbar with icons for File Explorer, Mail, and other applications.

Router 5

The screenshot shows the GNS3 console interface with multiple tabs for routers R2, R3, R4, R5, and R1. The R5 tab is active, displaying the command-line interface (CLI) output:

```
R5>
R5>
R5>
R5>show mpls forwarding-table
Local Outgoing Prefix Bytes tag Outgoing Next Hop
tag tag or VC or Tunnel Id switched interface
16 16 192.168.12.0/24 0 Se0/0 point2point
17 17 192.168.13.0/24 0 Se0/0 point2point
18 Pop tag 192.168.22.0/24 0 Se0/0 point2point
19 18 192.168.23.0/24 0 Se0/0 point2point
R5>
R5>
R5>
R5>
R5>
R5>
R5>
```

To the right of the console is a "Map topology" panel showing a single server node labeled "Main server" at IP 127.0.0.1. The bottom of the screen shows a Windows taskbar with icons for File Explorer, Mail, and other applications.

c. show mpls forwarding-table detail

This command shows the mpls forwarding-table detail with more information.

Router 1

The screenshot shows a GNS3 console window titled "GNS3 console" with tabs for R2, R3, R4, R5, and R1. The R1 tab is active, displaying the output of the "show mpls forwarding-table detail" command. The output lists several entries for different prefixes and their corresponding forwarding details. A sidebar on the left contains icons for file operations like copy, paste, and search. On the right, there is a "Map topology" section showing a single "Main server" node at IP 127.0.0.1, and a "Servers" section. The taskbar at the bottom shows various application icons and the system clock.

```
R1>show mpls forwarding-table detail
Local Outgoing Prefix Bytes tag Outgoing Next Hop
tag tag or VC or Tunnel Id switched interface
16 Pop tag 192.168.23.0/24 0 Se0/1 point2point
    MAC/Encaps=4/4, MRU=1504, Tag Stack{}
    OF008847
    No output feature configured
Per-destination load-sharing, slots: 0 2 4 6 8 10 12 14
    Pop tag 192.168.23.0/24 0 Se0/0 point2point
    MAC/Encaps=4/4, MRU=1504, Tag Stack{}
    OF008847
    No output feature configured
Per-destination load-sharing, slots: 1 3 5 7 9 11 13 15
    Pop tag 192.168.22.0/24 0 Se0/0 point2point
    MAC/Encaps=4/4, MRU=1504, Tag Stack{}
    OF008847
    No output feature configured
Per-packet load-sharing
18    17 192.168.21.0/24 0 se0/0 point2point
    MAC/Encaps=4/8, MRU=1500, Tag Stack[17]
    OF008847 00011000
    No output feature configured
Per-packet load-sharing
R1>
```

Router 2

The screenshot shows a GNS3 console window titled "GNS3 console" with tabs for R2, R3, R4, R5, and R1. The R2 tab is active, displaying the output of the "show mpls forwarding-table detail" command. The output shows two main entries for prefixes 192.168.13.0/24 and 192.168.21.0/24, each with two corresponding forwarding entries. A sidebar on the left contains icons for file operations like copy, paste, and search. On the right, there is a "Map topology" section showing a single "Main server" node at IP 127.0.0.1, and a "Servers" section. The taskbar at the bottom shows various application icons and the system clock.

```
R2>show mpls forwarding-table detail
Local Outgoing Prefix Bytes tag Outgoing Next Hop
tag tag or VC or Tunnel Id switched interface
16 Pop tag 192.168.13.0/24 0 Se0/0 point2point
    Pop tag 192.168.21.0/24 0 Se0/2 point2point
    MAC/Encaps=4/4, MRU=1504, Tag Stack{}
    OF008847
    No output feature configured
Per-destination load-sharing, slots: 0 2 4 6 8 10 12 14
    Pop tag 192.168.13.0/24 0 Se0/0 point2point
    MAC/Encaps=4/4, MRU=1504, Tag Stack{}
    OF008847
    No output feature configured
Per-destination load-sharing, slots: 1 3 5 7 9 11 13 15
    Pop tag 192.168.21.0/24 0 Se0/2 point2point
    MAC/Encaps=4/4, MRU=1504, Tag Stack{}
    OF008847
    No output feature configured
Per-packet load-sharing
R2>
```

Router 3

```
R3>
R3>
R3>show mpls forwarding-table detail
Local Outgoing Prefix Bytes tag Outgoing interface Next Hop
tag tag or VC or Tunnel Id switched
16 Pop tag 192.168.12.0/24 0 Se0/1 point2point
MAC/Encaps=4/4, MRU=1504, Tag Stack{}
OF008847
No output feature configured
Per-destination load-sharing, slots: 0 2 4 6 8 10 12 14
Pop tag 192.168.12.0/24 0 Se0/0 point2point
MAC/Encaps=4/4, MRU=1504, Tag Stack{}
OF008847
No output feature configured
Per-destination load-sharing, slots: 1 3 5 7 9 11 13 15
Pop tag 192.168.22.0/24 0 Se0/1 point2point
MAC/Encaps=4/4, MRU=1504, Tag Stack{}
OF008847
No output feature configured
Per-packet load-sharing
17 17 192.168.21.0/24 0 Se0/1 point2point
MAC/Encaps=4/8, MRU=1500, Tag Stack{17}
OF008847 00011000
No output feature configured
per-packet load-sharing
R3>
```

Router 4

```
R4>
R4>
R4>
R4>
R4>
R4>
R4>show mpls forwarding-table detail
Local Outgoing Prefix Bytes tag Outgoing interface Next Hop
tag tag or VC or Tunnel Id switched
16 Pop tag 192.168.13.0/24 0 Se0/0 point2point
MAC/Encaps=4/4, MRU=1504, Tag Stack{}
OF008847
No output feature configured
Per-packet load-sharing
17 16 192.168.13.0/24 0 Se0/0 point2point
MAC/Encaps=4/8, MRU=1500, Tag Stack{16}
OF008847 00010000
No output feature configured
Per-packet load-sharing
18 Pop tag 192.168.23.0/24 0 Se0/0 point2point
MAC/Encaps=4/4, MRU=1504, Tag Stack{}
OF008847
No output feature configured
per-packet load-sharing
R4>
```

Router 5

The screenshot shows the GNS3 console interface with Router 5 selected. The terminal window displays the output of the command `show mpls forwarding-table detail`. The output lists four entries in the MPLS Forwarding Table:

Local tag	Outgoing tag or VC	Prefix	Bytes tag	switched interface	Outgoing interface	Next Hop
16	16	192.168.12.0/24	0	Se0/0	Se0/0	point2point
17	17	192.168.13.0/24	0	Se0/0	Se0/0	point2point
18	18	192.168.22.0/24	0	Se0/0	Se0/0	point2point
19	18	192.168.23.0/24	0	Se0/0	Se0/0	point2point

Each entry includes details about MAC encapsulation, MRU, and Tag Stack.

Below the terminal window, the Windows taskbar shows the file "GNS3 IOS.zip" is open. The system tray indicates the date and time as 9/22/2021 at 9:58 PM.

d. show mpls ldp bindings or show tag-switching tdp bindings

Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) supports inbound label binding filtering. We can use the MPLS LDP Inbound Label Binding Filtering feature to configure access control lists (ACLs) for controlling the label bindings a label switch router (LSR) accepts from its peer LSRs. The MPLS LDP Inbound Label Binding Filtering feature may be used to control the amount of memory used to store LDP label bindings advertised by other routers.

Router 1

```
R1>show mpls ldp bindings
    tib entry: 192.168.12.0/24, rev 8
        local binding: tag: imp-null
        remote binding: tsr: 192.168.12.2:0, tag: imp-null
        remote binding: tsr: 192.168.13.2:0, tag: 16
    tib entry: 192.168.13.0/24, rev 12
        local binding: tag: imp-null
        remote binding: tsr: 192.168.12.2:0, tag: 16
        remote binding: tsr: 192.168.13.2:0, tag: imp-null
    tib entry: 192.168.21.0/24, rev 18
        local binding: tag: 18
        remote binding: tsr: 192.168.12.2:0, tag: 17
        remote binding: tsr: 192.168.13.2:0, tag: 18
    tib entry: 192.168.22.0/24, rev 16
        local binding: tag: 17
        remote binding: tsr: 192.168.12.2:0, tag: imp-null
        remote binding: tsr: 192.168.13.2:0, tag: 17
    tib entry: 192.168.23.0/24, rev 14
        local binding: tag: 16
        remote binding: tsr: 192.168.12.2:0, tag: imp-null
        remote binding: tsr: 192.168.13.2:0, tag: imp-null
R1>
R1>
R1>
R1>
R1>
```

Router 2

```
R2>
R2>
R2>show mpls ldp bindings
    tib entry: 192.168.12.0/24, rev 2
        local binding: tag: imp-null
        remote binding: tsr: 192.168.12.1:0, tag: imp-null
        remote binding: tsr: 192.168.13.2:0, tag: 16
        remote binding: tsr: 192.168.22.2:0, tag: 16
    tib entry: 192.168.13.0/24, rev 9
        local binding: tag: 16
        remote binding: tsr: 192.168.12.1:0, tag: imp-null
        remote binding: tsr: 192.168.13.2:0, tag: imp-null
        remote binding: tsr: 192.168.22.2:0, tag: 17
    tib entry: 192.168.21.0/24, rev 16
        local binding: tag: 17
        remote binding: tsr: 192.168.22.2:0, tag: imp-null
        remote binding: tsr: 192.168.12.1:0, tag: 18
        remote binding: tsr: 192.168.13.2:0, tag: 18
    tib entry: 192.168.22.0/24, rev 14
        local binding: tag: imp-null
        remote binding: tsr: 192.168.12.1:0, tag: 17
        remote binding: tsr: 192.168.13.2:0, tag: 17
        remote binding: tsr: 192.168.22.2:0, tag: imp-null
    tib entry: 192.168.23.0/24, rev 12
        local binding: tag: imp-null
        remote binding: tsr: 192.168.12.1:0, tag: 16
--More--
```

Router 3

The screenshot shows the GNS3 console interface. On the left is a toolbar with various icons. In the center, the 'GNS3 console' tab is active, showing the command-line interface (CLI) for Router 3. The output of the 'show mpls ldp bindings' command is displayed, listing multiple entries in the TIB (Table of Bindings). The right side of the screen shows a 'Map topology' window with a single server entry: 'Main server' at IP 127.0.0.1. Below the main window is a taskbar with the 'GNS3 IOS.zip' file and system status icons.

```
No output feature configured
Per-packet load-sharing
R3>
R3>
R3>
R3>show mpls ldp bindings
  fib entry: 192.168.12.0/24, rev 6
    local binding: tag: 16
    remote binding: tsr: 192.168.12.1:0, tag: imp-null
    remote binding: tsr: 192.168.12.2:0, tag: imp-null
  fib entry: 192.168.13.0/24, rev 2
    local binding: tag: imp-null
    remote binding: tsr: 192.168.12.1:0, tag: imp-null
    remote binding: tsr: 192.168.12.2:0, tag: 16
  fib entry: 192.168.21.0/24, rev 10
    local binding: tag: 18
    remote binding: tsr: 192.168.12.2:0, tag: 17
    remote binding: tsr: 192.168.12.1:0, tag: 18
  fib entry: 192.168.22.0/24, rev 8
    local binding: tag: 17
    remote binding: tsr: 192.168.12.2:0, tag: imp-null
    remote binding: tsr: 192.168.12.1:0, tag: 17
  fib entry: 192.168.23.0/24, rev 4
    local binding: tag: imp-null
    remote binding: tsr: 192.168.12.1:0, tag: 16
    remote binding: tsr: 192.168.12.2:0, tag: imp-null
R3>
```

Router 4

The screenshot shows the GNS3 console interface. Similar to Router 3, it features a toolbar on the left, an active 'GNS3 console' tab in the center displaying the Router 4 CLI, and a 'Map topology' window on the right showing a single server entry. The taskbar at the bottom includes the 'GNS3 IOS.zip' file and system status indicators.

```
R4>
R4>
R4>
R4>
R4>
R4>show mpls ldp bindings
  fib entry: 192.168.12.0/24, rev 6
    local binding: tag: 16
    remote binding: tsr: 192.168.12.2:0, tag: imp-null
    remote binding: tsr: 192.168.21.2:0, tag: 16
  fib entry: 192.168.13.0/24, rev 8
    local binding: tag: 17
    remote binding: tsr: 192.168.12.2:0, tag: 16
    remote binding: tsr: 192.168.21.2:0, tag: 17
  fib entry: 192.168.21.0/24, rev 4
    local binding: tag: imp-null
    remote binding: tsr: 192.168.12.2:0, tag: 17
    remote binding: tsr: 192.168.21.2:0, tag: imp-null
  fib entry: 192.168.22.0/24, rev 2
    local binding: tag: imp-null
    remote binding: tsr: 192.168.12.2:0, tag: imp-null
    remote binding: tsr: 192.168.21.2:0, tag: 18
  fib entry: 192.168.23.0/24, rev 10
    local binding: tag: 18
    remote binding: tsr: 192.168.12.2:0, tag: imp-null
    remote binding: tsr: 192.168.21.2:0, tag: 19
R4>
```

Router 5

The screenshot shows the GNS3 software interface. On the left, there's a toolbar with various icons. In the center, the 'GNS3 console' window is open, showing the command-line interface for Router 5 (R5). The output of the 'show mpls ldp bindings' command is displayed, listing several TIB entries with their local and remote binding details. To the right of the console, a 'Map topology' window shows a network diagram with nodes labeled R2, R3, R4, R5, and R1. Below the main windows, the Windows taskbar is visible, showing the date and time (10:03 PM, 9/22/2021), system tray icons, and a search bar.

```
R5>
R5>
R5>
R5>
R5>show mpls ldp bindings
tib entry: 192.168.12.0/24, rev 4
    local binding: tag: 16
    remote binding: tsr: 192.168.22.2:0, tag: 16
tib entry: 192.168.13.0/24, rev 6
    local binding: tag: 17
    remote binding: tsr: 192.168.22.2:0, tag: 17
tib entry: 192.168.21.0/24, rev 2
    local binding: tag: imp-null
    remote binding: tsr: 192.168.22.2:0, tag: imp-null
tib entry: 192.168.22.0/24, rev 8
    local binding: tag: 18
    remote binding: tsr: 192.168.22.2:0, tag: imp-null
tib entry: 192.168.23.0/24, rev 10
    local binding: tag: 19
    remote binding: tsr: 192.168.22.2:0, tag: 18
R5>
R5>
R5>
R5>
R5>
R5>
```

e. show ip cef detail

This command functions somewhat like show ip route, but shows information from the forwarding plane itself (the FIB instead of the RIB). As such, its output is rather spartan and to the point. Also I have noticed that the CEF output includes a few entries which don't appear in show ip route, such as the default route to null0. The CEF form of the command can be especially convenient within MPLS networks, as it includes label information. If we want to see all routes which point out a given interface. Instead of trying to glean this information from show ip route, we can specify an interface with show ip cef. Finally, show ip cef can also be used to predict the route of an explicit source and destination address pair. This can be handy when equal-cost load balancing or source-based policy routing is in place.

Router 1

The screenshot shows a web browser window with multiple tabs open. The active tab is titled 'GNS3 console' and displays the command-line interface (CLI) of Router 1. The CLI output includes:

```
remote binding: tsr: 192.168.13.2:0, tag: imp-null
R1>
R1>
R1>
R1>
R1>show ip cef detail
IP CEF with switching (Table Version 28), flags=0x0
  19 routes, 0 reresolve, 0 unresolved (0 old, 0 new), peak 0
  19 leaves, 12 nodes, 15424 bytes, 36 inserts, 17 invalidations
  1 load sharing elements, 376 bytes, 1 references
  universal per-destination load sharing algorithm, id 9AF8A098
  3(0) CEF resets, 1 revisions of existing leaves
  Resolution Timer: Exponential (currently 1s, peak 1s)
  0 in-place/0 aborted modifications
  refcounts: 3384 leaf, 3328 node

  Table epoch: 0 (19 entries at this epoch)

Adjacency Table has 4 adjacencies
  0.0.0.0/0, version 0, epoch 0, attached, default route handler
  0 packets, 0 bytes
    via 0.0.0.0, 0 dependencies
      valid no route adjacency
  0.0.0.0/8, version 6, epoch 0
  0 packets, 0 bytes
    via 0.0.0.0, 0 dependencies
      next hop 0.0.0.0

  192.168.21.1
```

The browser's sidebar shows a network topology with a single 'Main server' node. Below the browser is a taskbar with various icons and a system tray showing the date and time.

The screenshot shows a second web browser window with similar setup to the first. The active tab is titled 'GNS3 console' and displays the command-line interface of Router 1. The CLI output is identical to the first screenshot, showing the show ip cef detail command and the resulting CEF and Adjacency tables.

The browser's sidebar shows a network topology with a single 'Main server' node. Below the browser is a taskbar with various icons and a system tray showing the date and time.

Router 2

R2>
R2>show ip cef detail
IP CEF with switching (Table Version 31), flags=0x0
22 routes, 0 reresolve, 0 unresolved (0 old, 0 new), peak 0
22 leaves, 13 nodes, 16920 bytes, 39 inserts, 17 invalidations
1 load sharing elements, 376 bytes, 1 references
universal per-destination load sharing algorithm, id 97331840
3(0) CEF resets, 1 revisions of existing leaves
Resolution Timer: Exponential (currently 1s, peak 1s)
0 in-place/0 aborted modifications
refcounts: 3650 leaf, 3584 node
Table epoch: 0 (22 entries at this epoch)
Adjacency Table has 6 adjacencies
0.0.0.0/0, version 0, epoch 0, attached, default route handler
0 packets, 0 bytes
via 0.0.0.0, 0 dependencies
valid no route adjacency
0.0.0.0/8, version 6, epoch 0
0 packets, 0 bytes
via 0.0.0.0, 0 dependencies
next hop 0.0.0.0
valid drop adjacency
0.0.0.0/32, version 1, epoch 0, receive
--More--

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Router 3

R3>
R3>
R3>show ip cef detail
IP CEF with switching (Table Version 20), flags=0x0
19 routes, 0 reresolve, 0 unresolved (0 old, 0 new), peak 0
19 leaves, 12 nodes, 15424 bytes, 28 inserts, 9 invalidations
1 load sharing elements, 376 bytes, 1 references
universal per-destination load sharing algorithm, id 7464F995
3(0) CEF resets, 1 revisions of existing leaves
Resolution Timer: Exponential (currently 1s, peak 1s)
0 in-place/0 aborted modifications
refcounts: 3384 leaf, 3328 node
Table epoch: 0 (19 entries at this epoch)
Adjacency Table has 4 adjacencies
0.0.0.0/0, version 0, epoch 0, attached, default route handler
0 packets, 0 bytes
via 0.0.0.0, 0 dependencies
valid no route adjacency
0.0.0.0/8, version 6, epoch 0
0 packets, 0 bytes
via 0.0.0.0, 0 dependencies
next hop 0.0.0.0
valid drop adjacency
0.0.0.0/32, version 1, epoch 0, receive
--More--

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Router 4

The screenshot shows the GNS3 console interface with multiple tabs: R2, R3, R4 (selected), R5, and R1. On the right, there is a 'Map topology' window showing a single 'Main server' at 127.0.0.1 and a 'Servers' section. Below the tabs, the terminal window displays the output of the command 'show ip cef detail'. The output shows 19 routes, 12 nodes, and 15368 bytes. It also details the universal per-destination load sharing algorithm (id 3C1B63A2) and the resolution timer (Exponential). The adjacency table has 4 adjacencies, all attached to the default route handler. The epoch is 0 with 19 entries.

```
R4>
R4>show ip cef detail
IP CEF with switching (Table Version 23), flags=0x0
 19 routes, 0 reresolve, 0 unresolved (0 old, 0 new), peak 0
 19 leaves, 12 nodes, 15368 bytes, 31 inserts, 12 invalidations
 0 load sharing elements, 0 bytes, 0 references
  universal per-destination load sharing algorithm, id 3C1B63A2
 3(0) CEF resets, 0 revisions of existing leaves
 Resolution Timer: Exponential (currently 1s, peak 1s)
 0 in-place/0 aborted modifications
 refcounts: 3383 leaf, 3328 node

 Table epoch: 0 (19 entries at this epoch)

 Adjacency Table has 4 adjacencies
 0.0.0.0/0, version 0, epoch 0, attached, default route handler
 0 packets, 0 bytes
   via 0.0.0.0, 0 dependencies
   valid no route adjacency
 0.0.0.0/8, version 6, epoch 0
 0 packets, 0 bytes
   via 0.0.0.0, 0 dependencies
   next hop 0.0.0.0
   valid drop adjacency
 0.0.0.0/32, version 1, epoch 0, receive
--More--
```

Router 5

The screenshot shows the GNS3 console interface with the same tab structure as Router 4. The 'Map topology' window shows a 'Main server' at 127.0.0.1. The terminal window displays the output of 'show ip cef detail' for Router 5. The output shows 16 routes, 11 nodes, and 13872 bytes. The universal per-destination load sharing algorithm (id C723BC69) and the resolution timer (Exponential) are also present. The adjacency table has 2 adjacencies, all attached to the default route handler. The epoch is 0 with 16 entries.

```
R5>
R5>show ip cef detail
IP CEF with switching (Table Version 16), flags=0x0
 16 routes, 0 reresolve, 0 unresolved (0 old, 0 new), peak 0
 16 leaves, 11 nodes, 13872 bytes, 24 inserts, 8 invalidations
 0 load sharing elements, 0 bytes, 0 references
  universal per-destination load sharing algorithm, id C723BC69
 3(0) CEF resets, 0 revisions of existing leaves
 Resolution Timer: Exponential (currently 1s, peak 1s)
 0 in-place/0 aborted modifications
 refcounts: 3117 leaf, 3072 node

 Table epoch: 0 (16 entries at this epoch)

 Adjacency Table has 2 adjacencies
 0.0.0.0/0, version 0, epoch 0, attached, default route handler
 0 packets, 0 bytes
   via 0.0.0.0, 0 dependencies
   valid no route adjacency
 0.0.0.0/8, version 6, epoch 0
 0 packets, 0 bytes
   via 0.0.0.0, 0 dependencies
   next hop 0.0.0.0
   valid drop adjacency
 0.0.0.0/32, version 1, epoch 0, receive
--More--
```