



PRACTICAL LAB: STATIC ROUTER CONFIGURATION 3 (WITH UNKNOWN PACKETS)



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Practical Lab: Static Router Configuration 3 (with unknown packets) - JA

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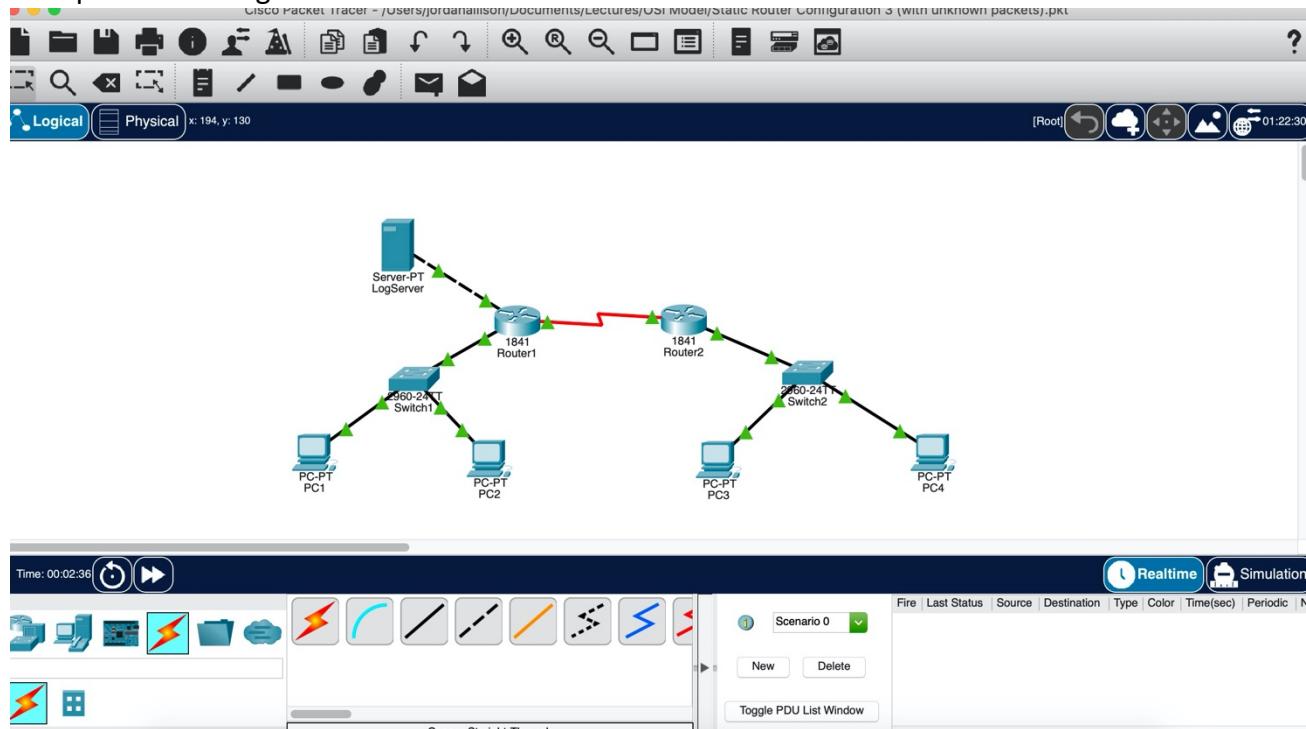
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1 Introduction

For this practical we will be using *Cisco Packet Tracer (student edition)*, a tool provided by Cisco to build and test Cisco networks. In this lab we are going to configure a network with static routes, and simulate the ability to send unknown packets to a log server.

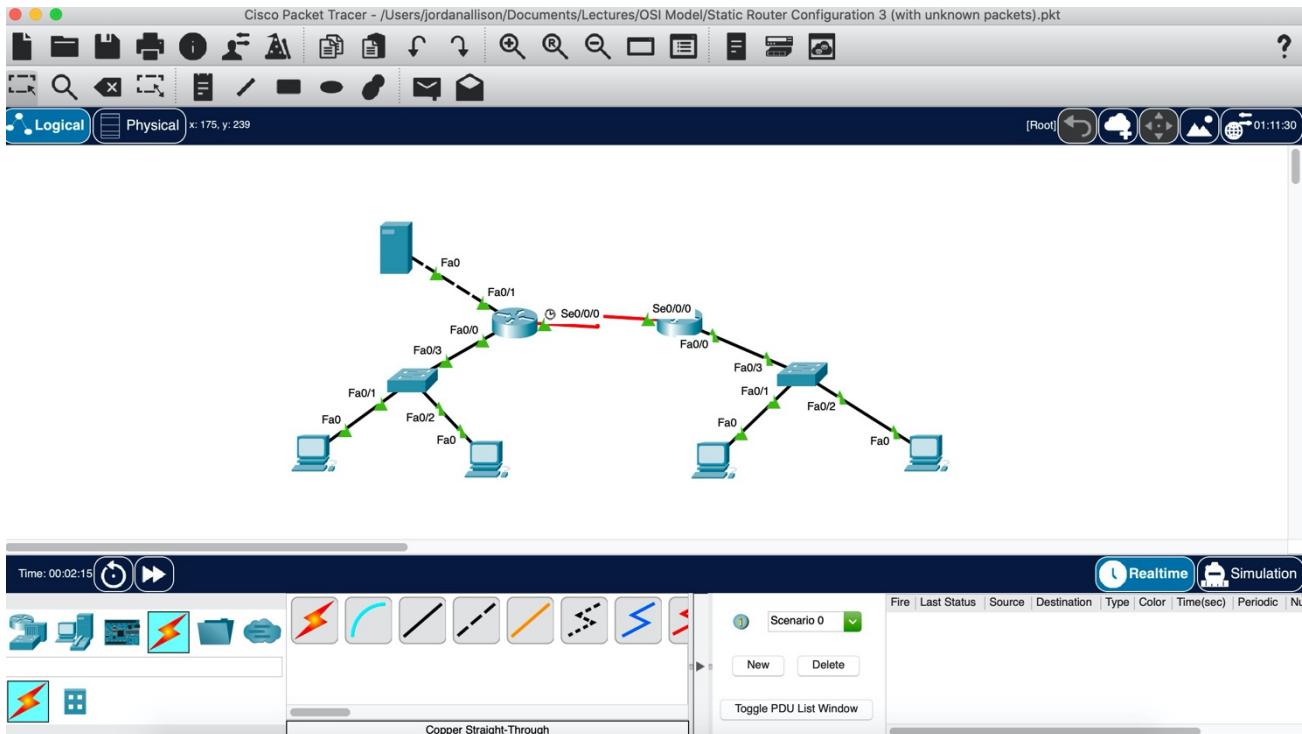
2 Setting Up Devices

Set up the following devices. Name and device view:



Cable connection view:

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3 Configure Devices

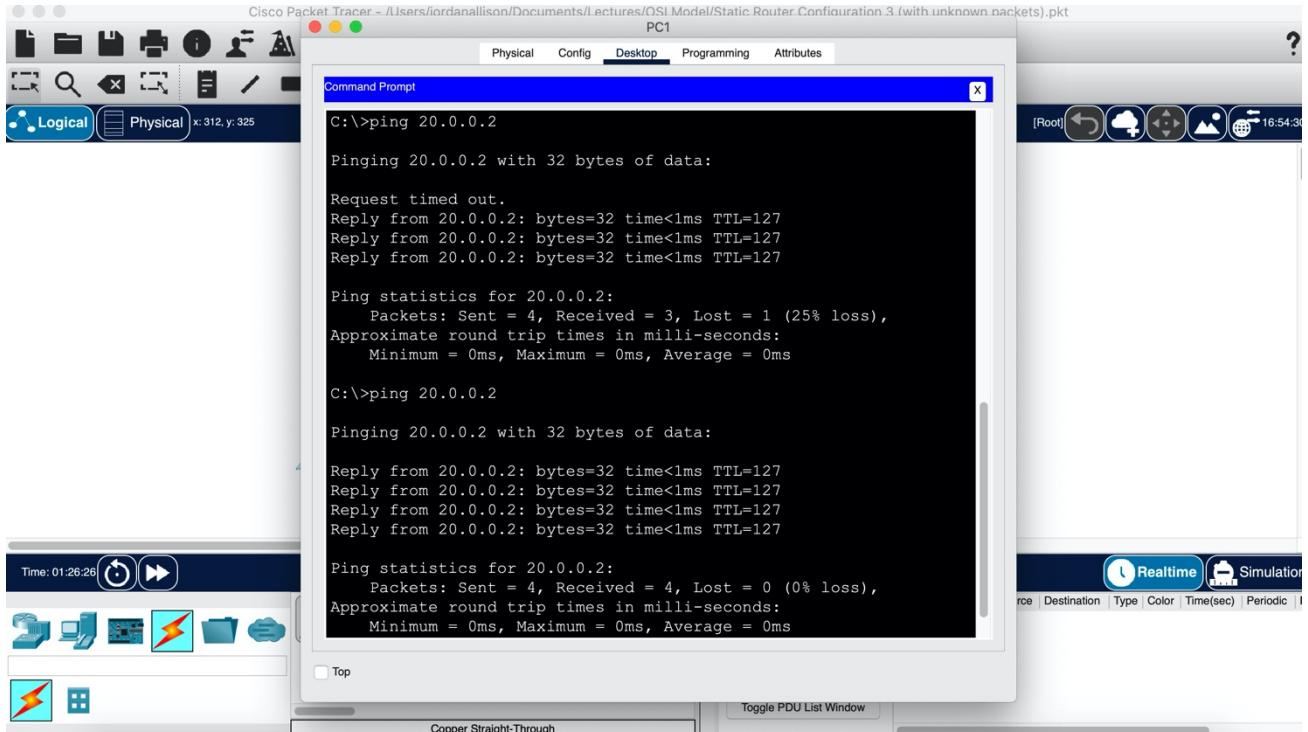
Configure the devices as given below:

Device	Interface	IP Addresses	Subnet Mask	Default Gateway
PC1	N/A	10.0.0.2	255.0.0.0	10.0.0.1
PC2	N/A	10.0.0.3	255.0.0.0	10.0.0.1
PC3	N/A	40.0.0.2	255.0.0.0	40.0.0.1
PC4	N/A	40.0.0.3	255.0.0.0	40.0.0.1
Router1	Fa0/0	10.0.0.1	255.0.0.0	N/A
	Fa0/1	20.0.0.1	255.0.0.0	N/A
	Se0/0	30.0.0.1	255.0.0.0	N/A
Router2	Fa0/0	40.0.0.1	255.0.0.0	N/A
	Se0/0	30.0.0.2	255.0.0.0	N/A
LogServer	N/A	20.0.0.2	255.0.0.0	20.0.0.1

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4 Test Connectivity.

Try pinging the log server from PC1



C:\>ping 20.0.0.2
Pinging 20.0.0.2 with 32 bytes of data:

Request timed out.
Reply from 20.0.0.2: bytes=32 time<1ms TTL=127
Reply from 20.0.0.2: bytes=32 time<1ms TTL=127
Reply from 20.0.0.2: bytes=32 time<1ms TTL=127

Ping statistics for 20.0.0.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 20.0.0.2

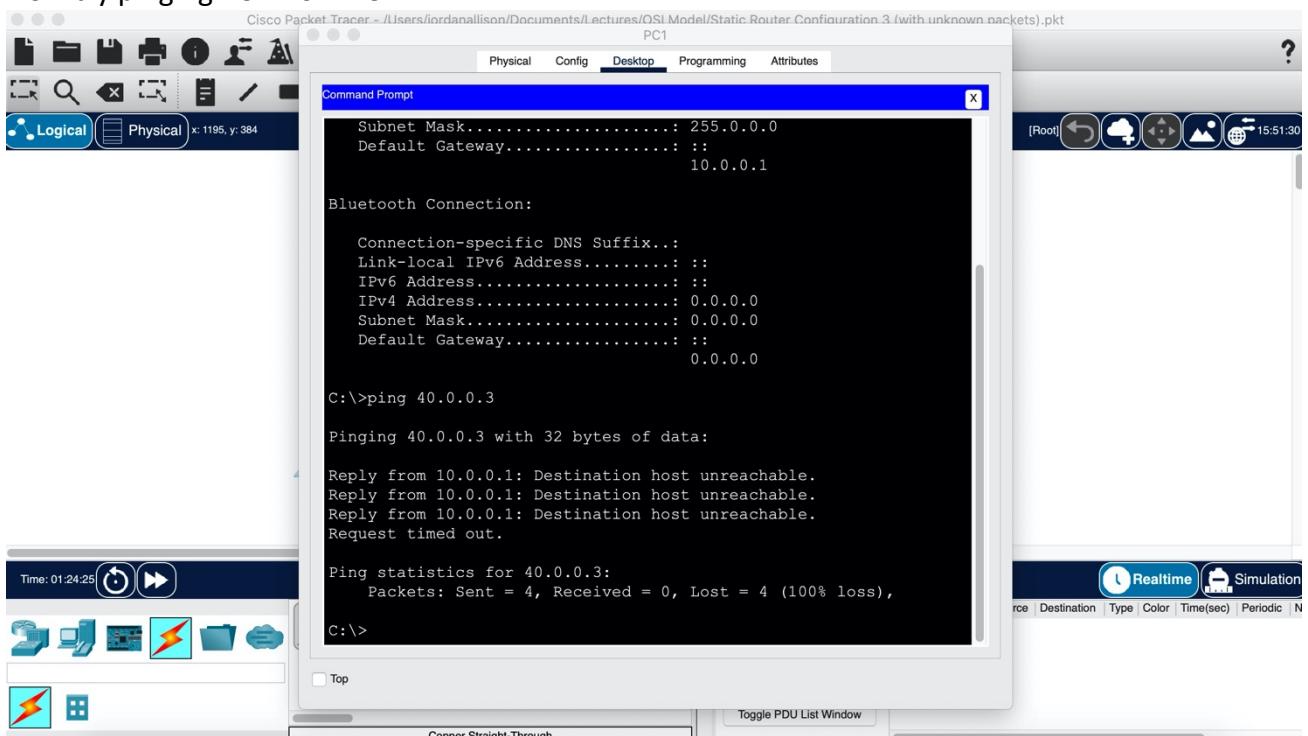
Pinging 20.0.0.2 with 32 bytes of data:

Reply from 20.0.0.2: bytes=32 time<1ms TTL=127

Ping statistics for 20.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms

This should work fine as above.

Now try pinging PC4 from PC1



Subnet Mask.....: 255.0.0.0
Default Gateway...: ::
 10.0.0.1

Bluetooth Connection:

Connection-specific DNS Suffix...:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
 0.0.0.0

C:\>ping 40.0.0.3

Pinging 40.0.0.3 with 32 bytes of data:

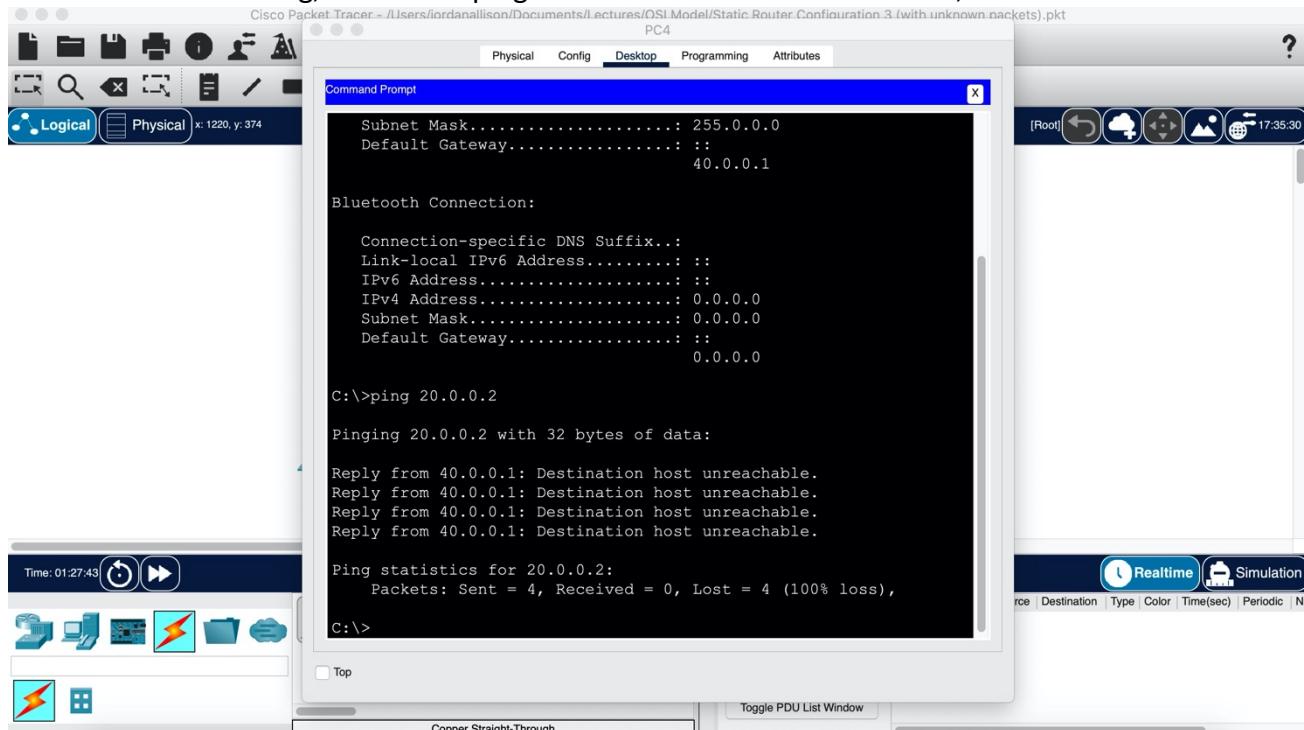
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Request timed out.

Ping statistics for 40.0.0.3:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

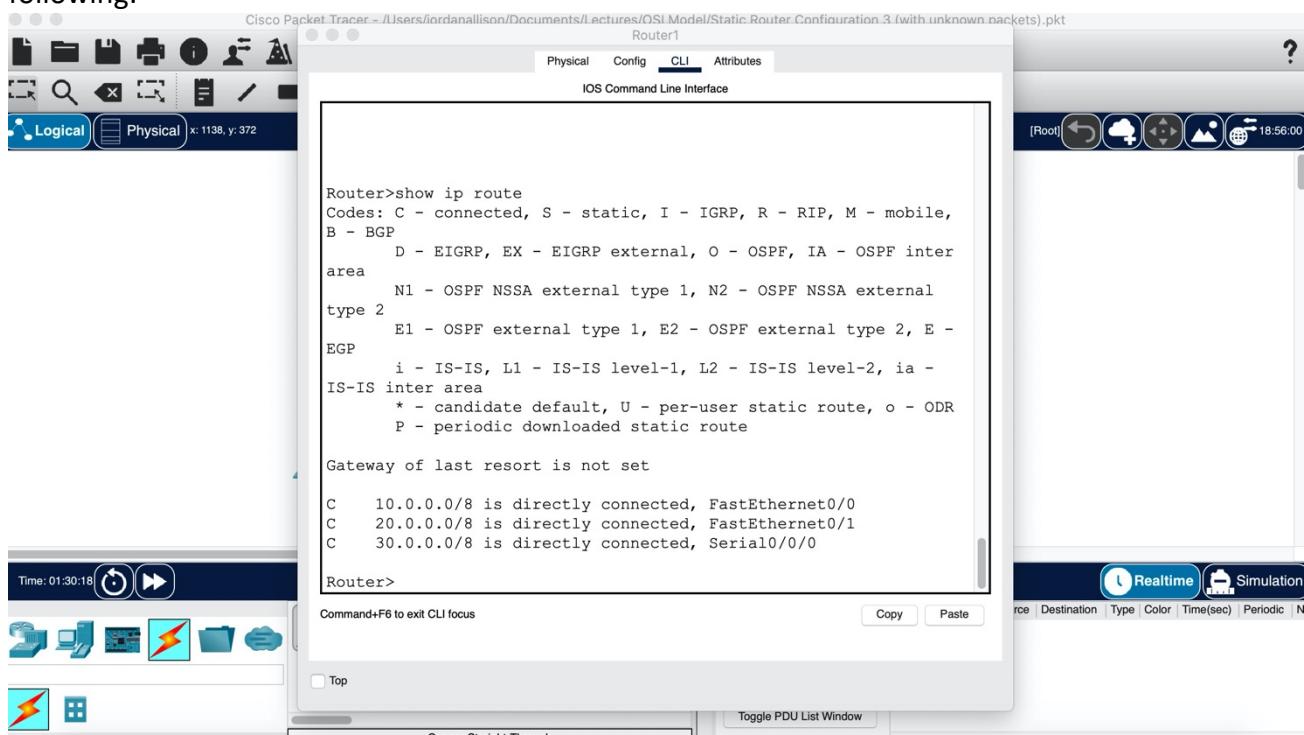
It should not work yet as we have not configured the static routes between the routers, so we will need to do this.

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For the same reasoning, we cannot ping the server from PC4 for instance, as seen below:



As an example, if we use the 'show IP route' command in the CLI of Router1, we should see the following:



We have the three connected routes as expected, but no static routes yet.

5 Add Static Routes

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For Router 1 we need the following:

- Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.2
- Router(config)#ip route 0.0.0.0 0.0.0.0 20.0.0.2

To do this go to CLI on Router 1 and do the following:

The screenshot shows the Cisco Packet Tracer interface. The main window title is "Cisco Packet Tracer - /Users/iordanallison/Documents/Lectures/OSI Model/Static Router Configuration 3 (with unknown packets).pkt". The tab bar at the top has "Physical", "Config", "CLI", and "Attributes" tabs, with "CLI" being the active tab. The central pane displays the IOS Command Line Interface (CLI) session for Router1. The command history shows the configuration of two static routes:

```
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    20.0.0.0/8 is directly connected, FastEthernet0/1
C    30.0.0.0/8 is directly connected, Serial0/0/0

Router>
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to up

Router>en
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 40.0.0.0 255.0.0.0 30.0.0.2
Router(config)#ip route 0.0.0.0 0.0.0.0 20.0.0.2
Router(config)#
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Command+F6 to exit CLI focus
```

Use the 'show ip route' command to see all routes added:

The screenshot shows the Cisco Packet Tracer interface with the same configuration as the previous screen. The CLI session now displays the output of the "show ip route" command:

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

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile,
B - BGP
          D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter
area
          N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
          E1 - OSPF external type 1, E2 - OSPF external type 2, E -
EGP
          i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia -
IS-IS inter area
          * - candidate default, U - per-user static route, o - ODR
          P - periodic downloaded static route

Gateway of last resort is 20.0.0.2 to network 0.0.0.0

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    20.0.0.0/8 is directly connected, FastEthernet0/1
C    30.0.0.0/8 is directly connected, Serial0/0/0
S*   40.0.0.0/8 [1/0] via 30.0.0.2
S*   0.0.0.0/0 [1/0] via 20.0.0.2

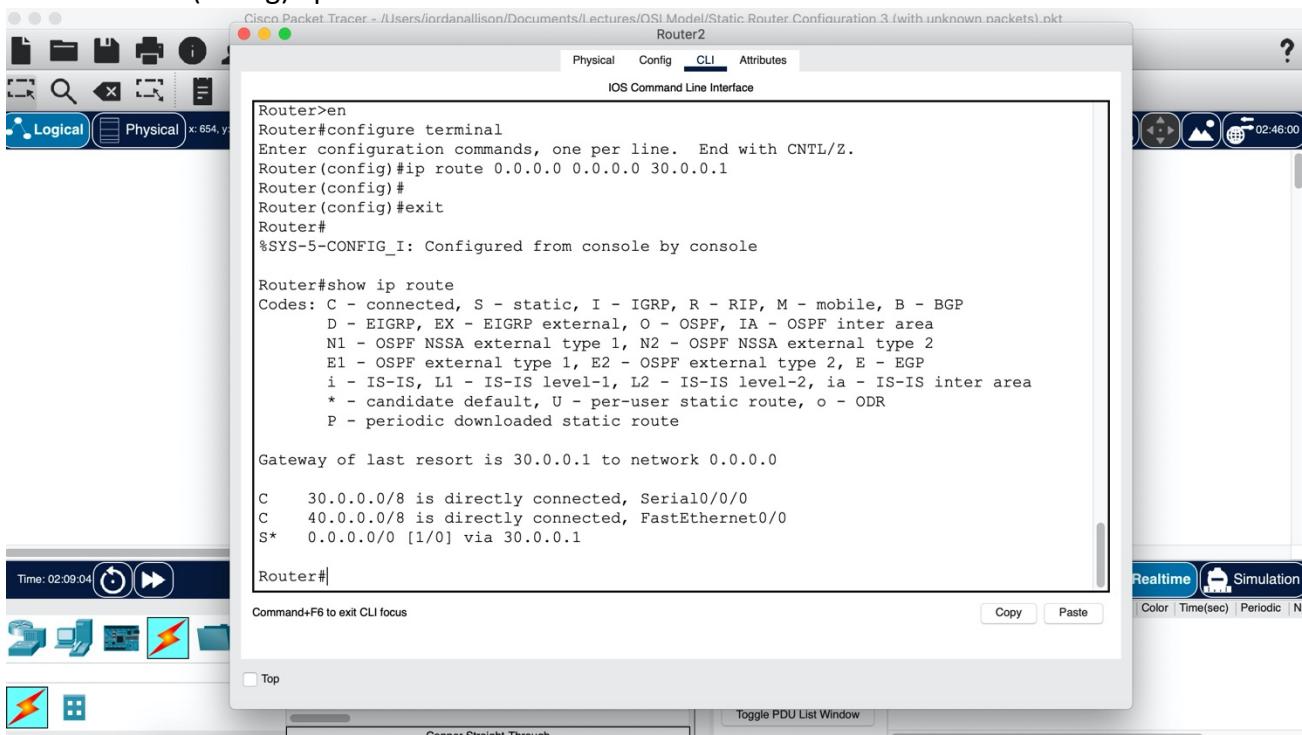
Router#
%SYS-5-CONFIG_I: Configured from console by console

Command+F6 to exit CLI focus
```

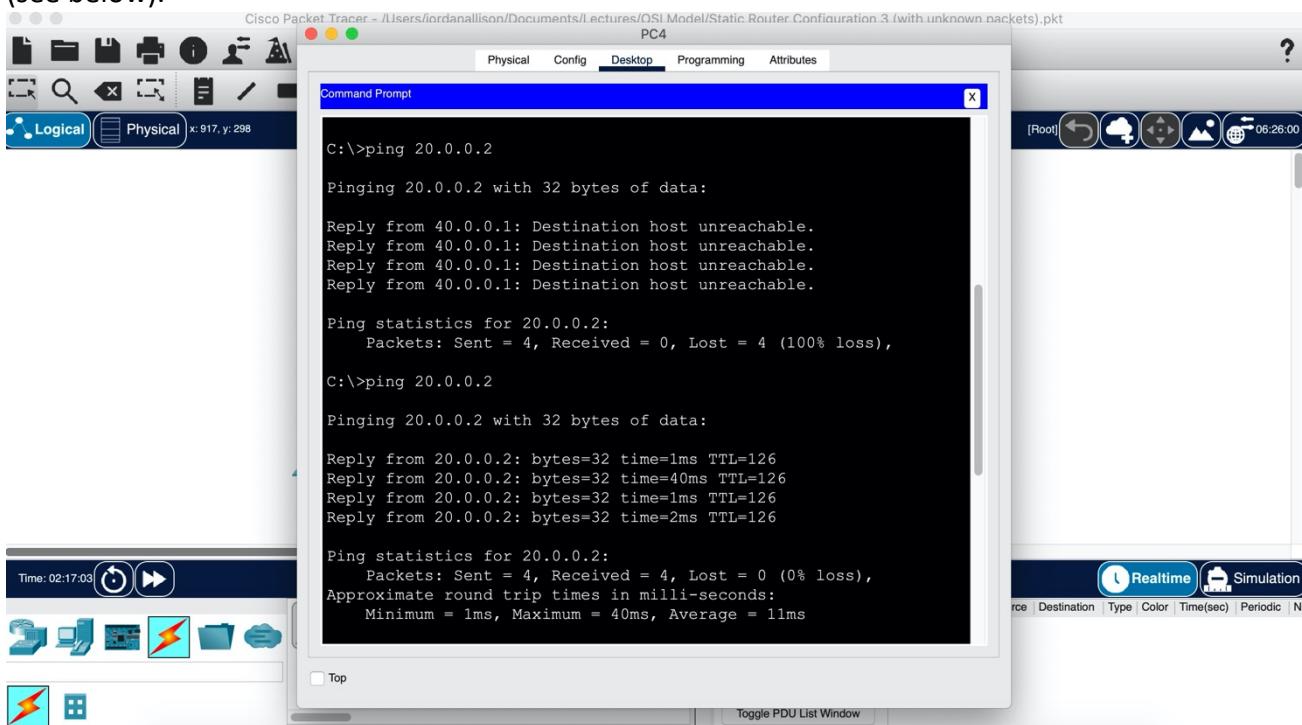
Now Router1 is configured, it is time for Router2. For Router 2 we need the following:

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- Router(config)#ip route 0.0.0.0 0.0.0.0 30.0.0.1



Now this is complete, we should be able to ping across the network(s). E.g. from PC4 to the server (see below).

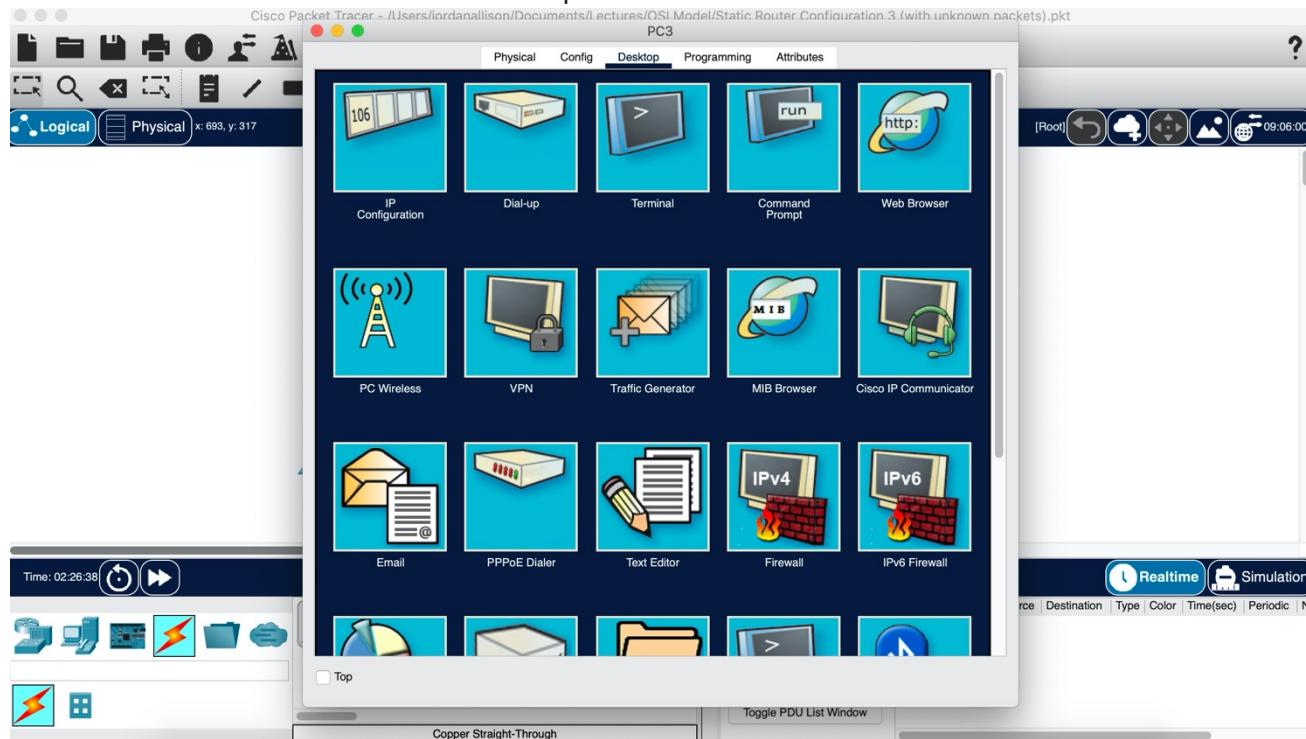


When looking at the above screenshot you can see the before and after attempt at pinging the server (20.0.0.2) from PC4 (40.0.0.3). In the first attempt, the destination host is unreachable, with the reply coming from Router2 (40.0.0.1). However, once the static route between routers is added, there is now a successful reply from the server (20.0.0.2).

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6 Simulating the Transfer of Unknown Packets to the LogServer.

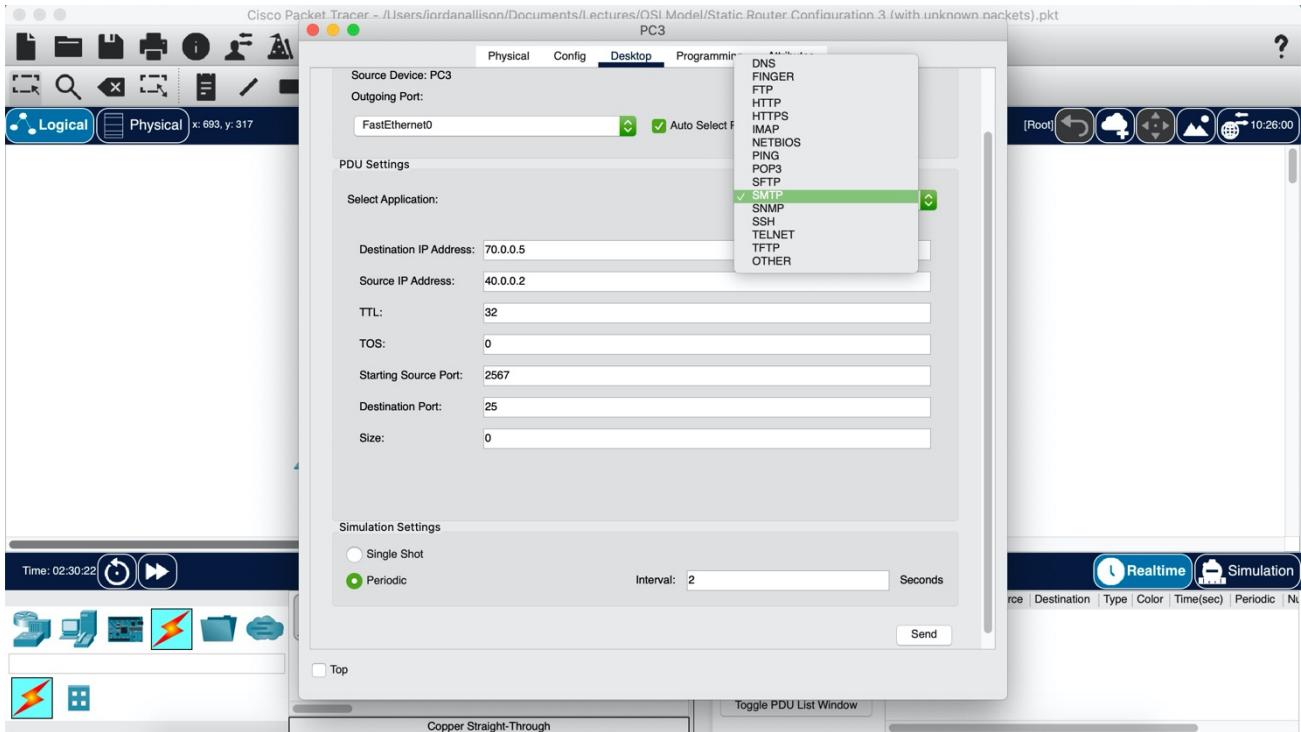
To verify that unknown packets will be forwarded to the server, click on PC3 and click the ‘Desktop’ tab and then click the ‘Traffic Generator’ option which looks like a letter with a +.



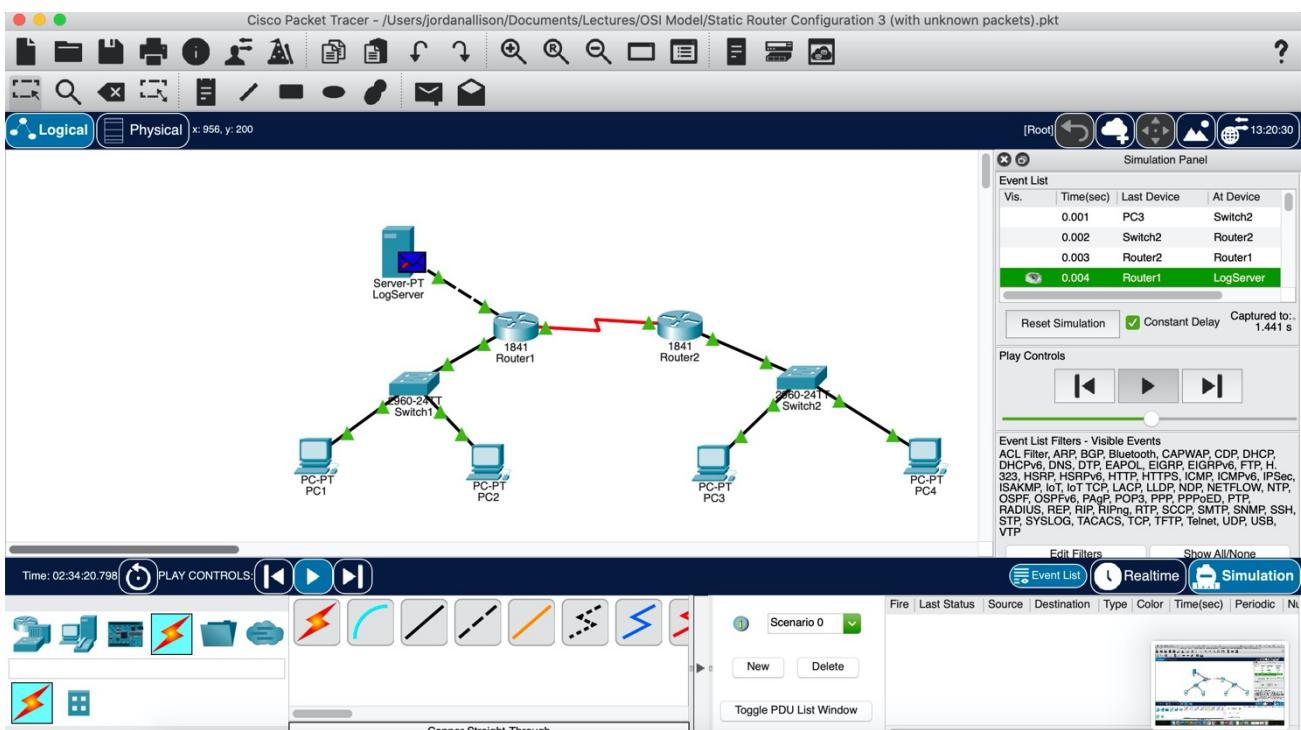
In the PDU Settings section, adjust the settings as highlighted below:

- Select any application such as SMTP from the drop-down.
- In the ‘destination IP address’ field, set an IP address that does not belong to your available networks.
- For the ‘Source IP Address’, type in the IP address of the PC you are using
- For the ‘Starting Source Port’, set any number between 1000 and 4000.
- For simulation settings, set to periodic, and set a time interval of 2 seconds.
- Then click send.

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Now enter the simulation mode, and press play. If the packets sent by PC3 to an unknown host (in the above case 70.0.05) reach the LogServer, then this shows that you have successfully configured everything successfully.



If you want to stop the testing, open the traffic generator back up on PC3, and click 'Stop'.

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