



PRACTICAL LAB: DIRECT AND STATIC ROUTER CONFIGURATION



JORDAN ALLISON
jallison1@glos.ac.uk

Practical Lab: Direct and Static Router Configuration - JA

Table of Contents

1	<i>Introduction</i>	2
2	<i>Install Packet Tracer</i>	2
3	<i>Using Packet Tracer</i>	3
4	<i>Setting up devices and cabling</i>	4
5	<i>Device Configuration</i>	5
6	<i>Adding Static Routes</i>	9

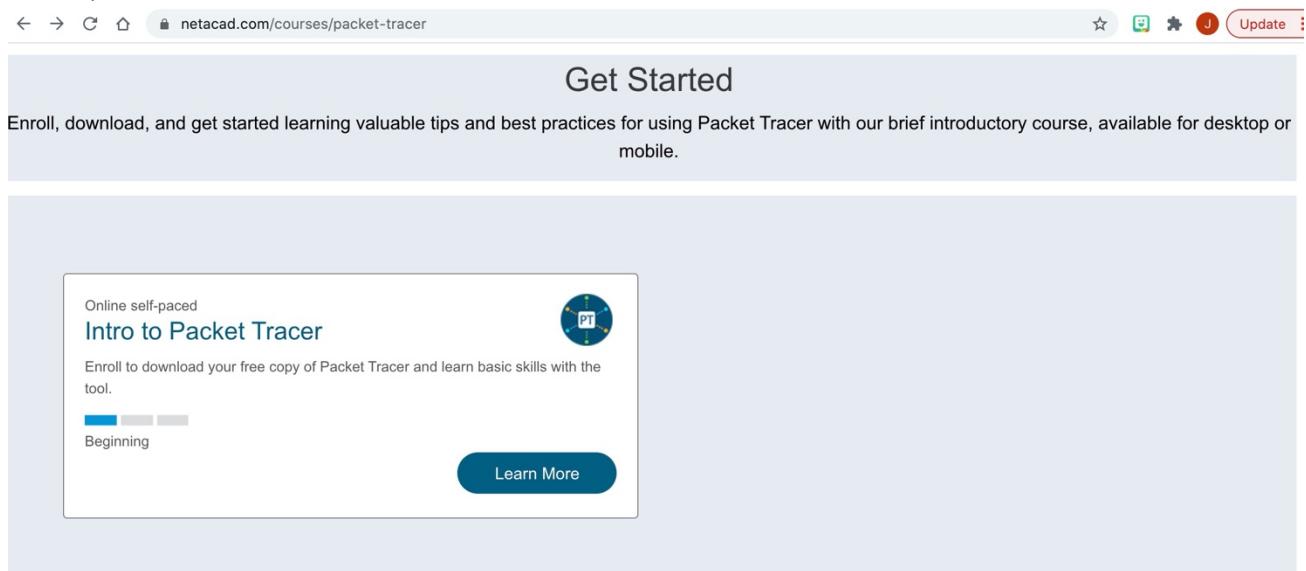
Practical Lab: Direct and Static Router Configuration - JA

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.

2 Install Packet Tracer

Please download and install the Packet Tracer application. You can access this on university PCs or you can download it once you have enrolled to the ‘Intro to Packet Tracer’ on netacad.com (see below).



The screenshot shows a web browser window with the URL netacad.com/courses/packet-tracer. The page title is 'Get Started'. Below the title, there is a brief description: 'Enroll, download, and get started learning valuable tips and best practices for using Packet Tracer with our brief introductory course, available for desktop or mobile.' A large button labeled 'Learn More' is visible. On the left, there is a box for the 'Intro to Packet Tracer' course, which is described as 'Online self-paced' and 'Beginning'. It includes a progress bar showing completion and a 'Learn More' button. At the bottom of the page, there are two more sections: 'Teaching with Packet Tracer' and 'Packet Tracer FAQs'.

Teaching with Packet Tracer

Discover how Packet Tracer helps instructors teach complex networking concepts.

[Learn More](#)

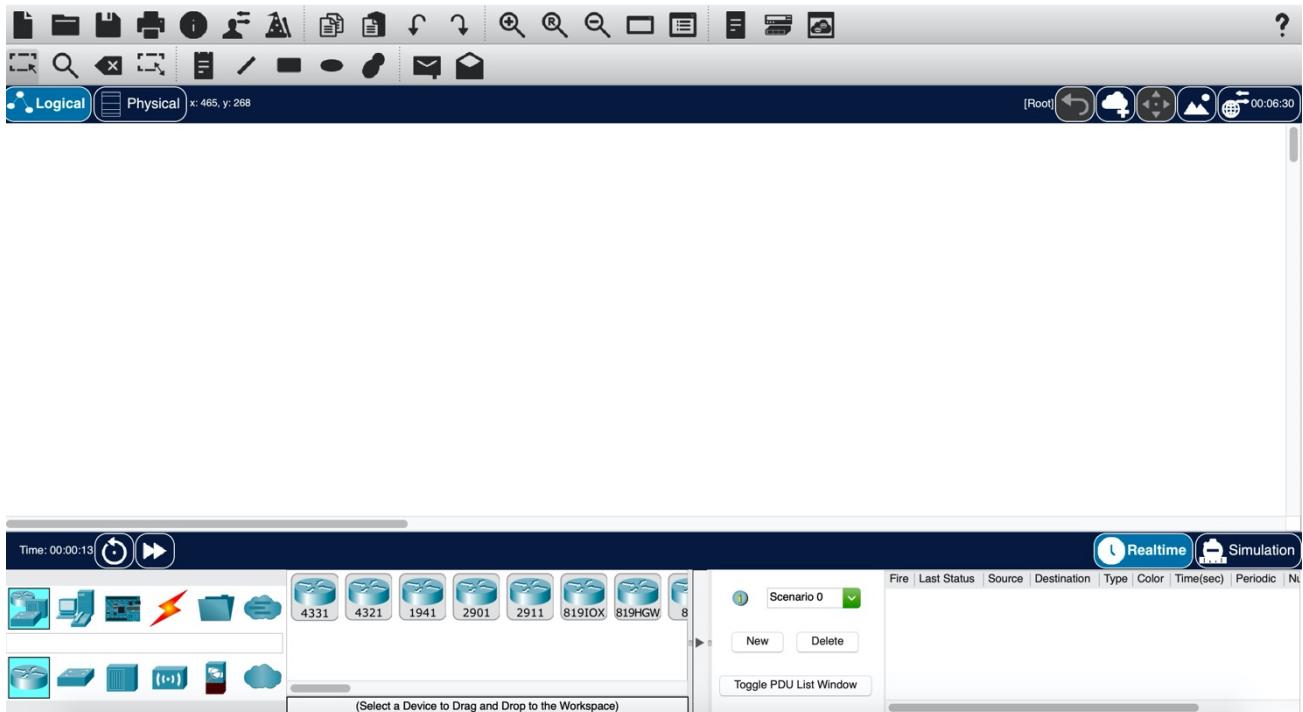
Packet Tracer FAQs

Still have questions? Get the answers to users most common questions

[Read](#)

Run the install. Once completed, the *Cisco Packet Tracer Student* shortcut should appear on your desktop. Double click the shortcut, you should see a screen similar to the one shown in the figure below.

Practical Lab: Direct and Static Router Configuration - JA



3 Using Packet Tracer

Watch the *Interface Overview* video. This is accessed by clicking Help, Tutorials and selecting Interface Overview in the Getting Started section.

Official Packet Tracer Tutorials
The following tutorials demonstrate the basic functions, features, and aspects of Packet Tracer.

1 Getting Started

- 1-0 Getting Started**
 - Learn how to start the application.
- 1-1 Interface Overview**
 - See section 15-1
 - Learn how to view and analyze network traffic.
- 1-2 Options**
 - Learn how to customize the application settings.

2 Logical Workspace

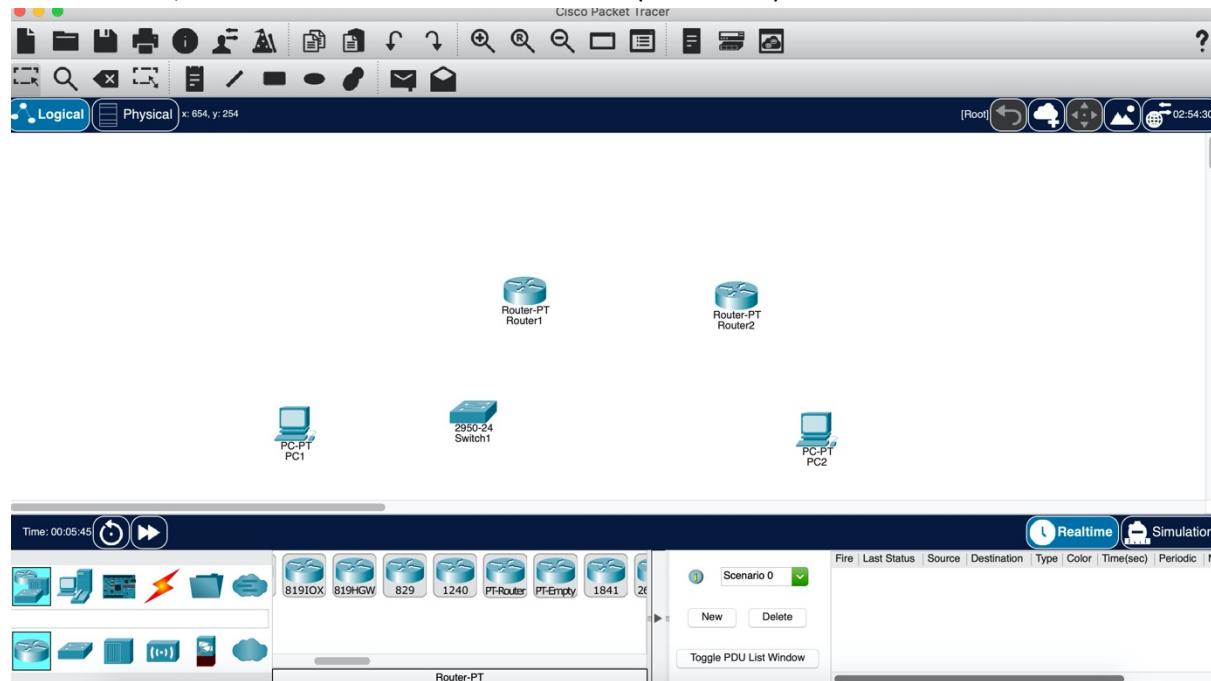
- 2-1 Creating A Network**
 - Learn how to create a basic network topology.
- 2-2 Custom Devices**
 - Learn how to create custom network devices.
- 2-3 Clustering A Network**
 - Learn how to create, arrange, uncluster, delete, and connect clusters.
- 2-4 Annotating A Network Topology**
 - Learn how to add annotations to network diagrams.

A video player window showing a tutorial video. The video frame displays the Cisco Packet Tracer interface with a network diagram. The video controls at the bottom indicate it is at 1:46 of a total duration of 1:46. The video title is 'which allows users to create'.

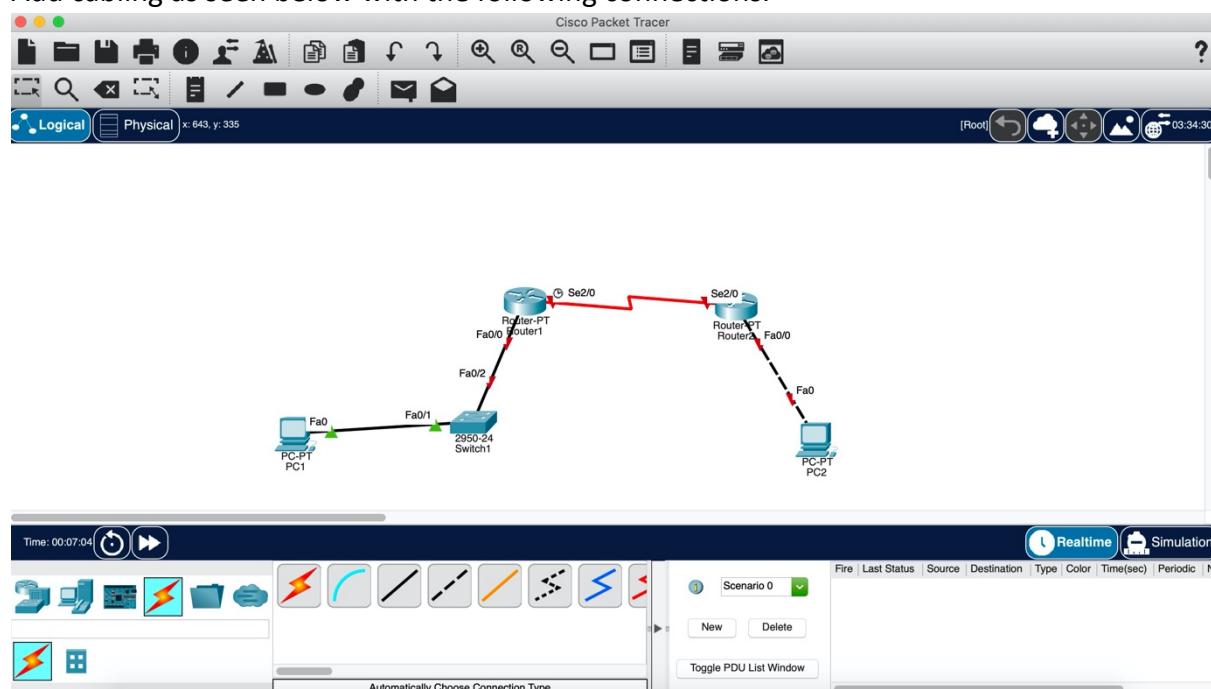
Practical Lab: Direct and Static Router Configuration - JA

4 Setting up devices and cabling

Add two PCs, a 2950-24 switch and two routers (Router PT) like below:



Add cabling as seen below with the following connections.



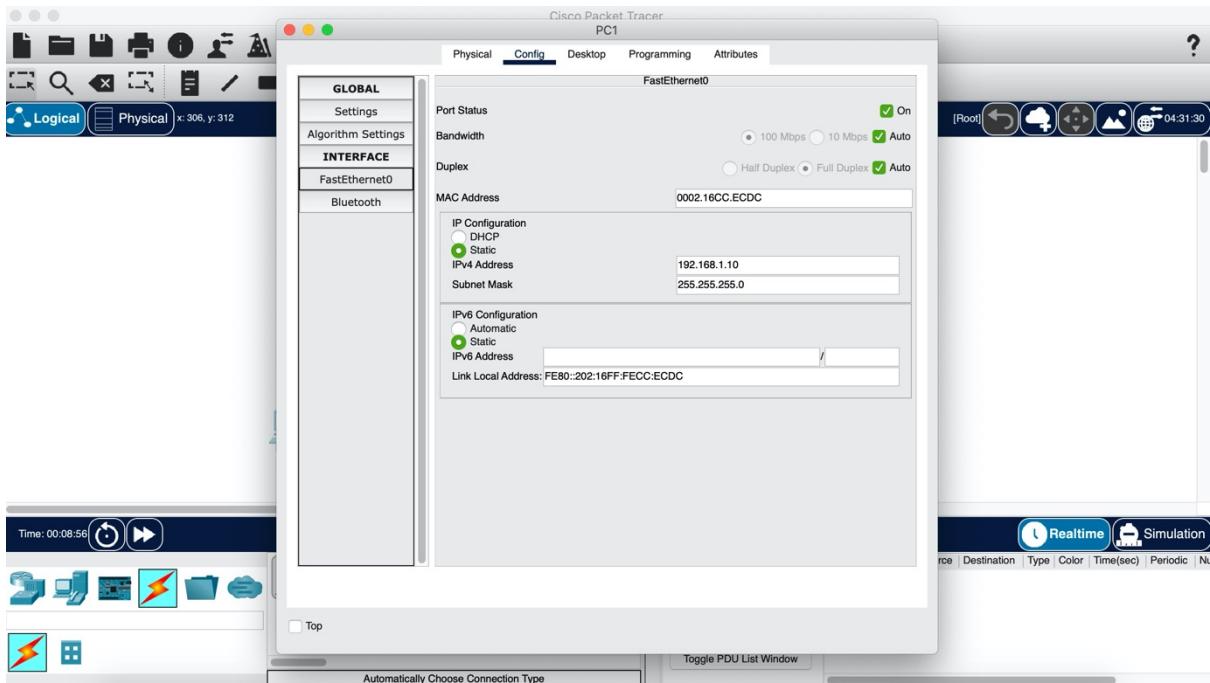
Practical Lab: Direct and Static Router Configuration - JA

5 Device Configuration

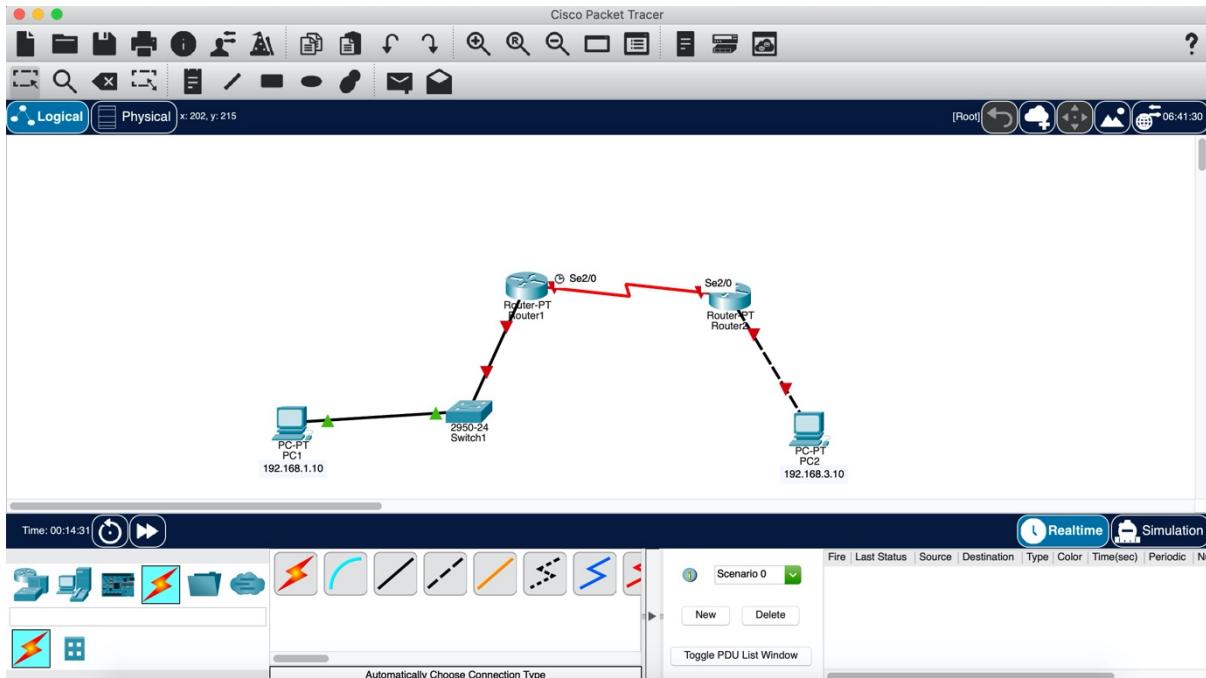
Configure the device to have the following:

Device	Interface	IP Addresses	Subnet Mask	Default Gateway
PC1	N/A	192.168.1.10	255.255.255.0	192.168.1.1
PC2	N/A	192.168.3.10	255.255.255.0	192.168.3.1
R1	Fa0/0	192.168.1.1	255.255.255.0	N/A
	Se2/0	192.168.2.1	255.255.255.0	N/A
R2	Fa0/0	192.168.3.1	255.255.255.0	N/A
	Se2/0	192.168.2.2	255.255.255.0	N/A

Configure PC1 and PC2



Practical Lab: Direct and Static Router Configuration - JA



Configure Router 1 with the instructions as shown below.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Router1
Router1(config)#interface Serial2/0
Router1(config-if)#ip address 192.168.2.1 255.255.255.0
Router1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router1(config-if)#clock rate 64000
Router1(config-if)#
Router1(config-if)#interface FastEthernet0/0
Router1(config-if)#ip address 192.168.1.1 255.255.255.0
Router1(config-if)#no shutdown

Router1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

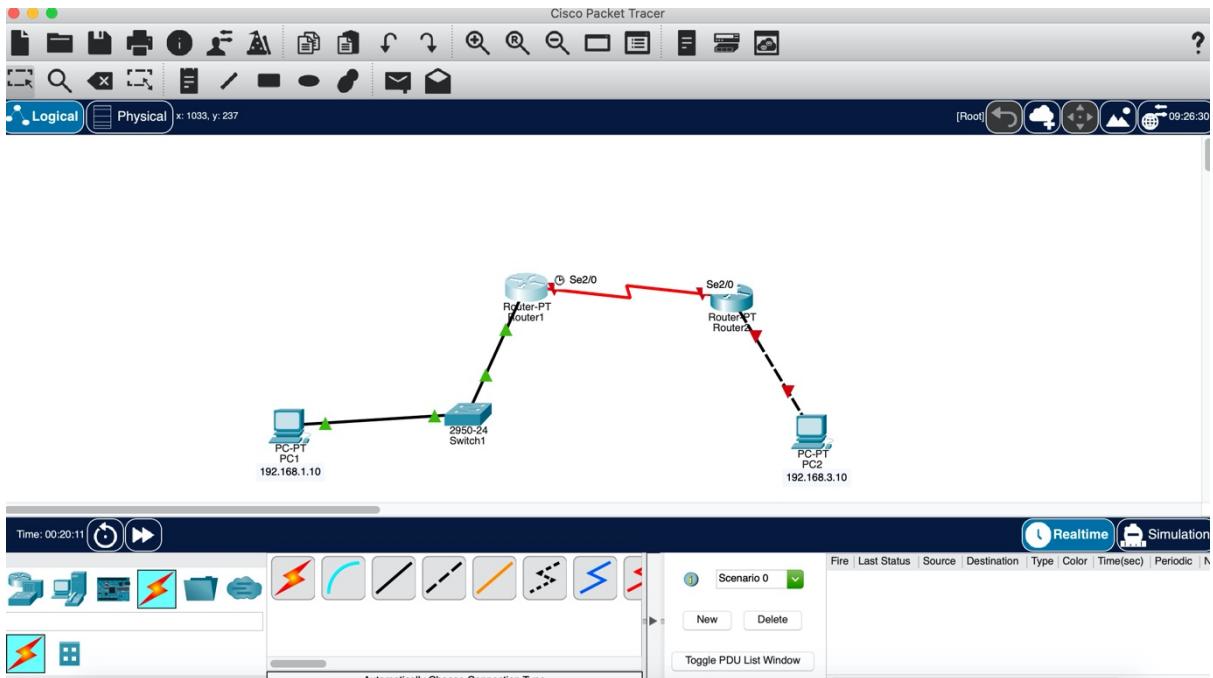
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router1(config-if)#exit
Router1(config)#exit
Router1#
%SYS-5-CONFIG_I: Configured from console by console

Command-F6 to exit CLU focus
```

Fast Ethernet between Router 1 and switch should then be connected green:

Practical Lab: Direct and Static Router Configuration - JA



Type in on Router 1: 'Show IP Interface Brief' to check your configuration.

The screenshot shows the Cisco Packet Tracer CLI interface for Router1. The user has entered the command `Show IP Interface Brief`. The output displays the configuration and status of all interfaces:

```
Router1(config-if)#interface FastEthernet0/0
Router1(config-if)#ip address 192.168.1.1 255.255.255.0
Router1(config-if)#no shutdown

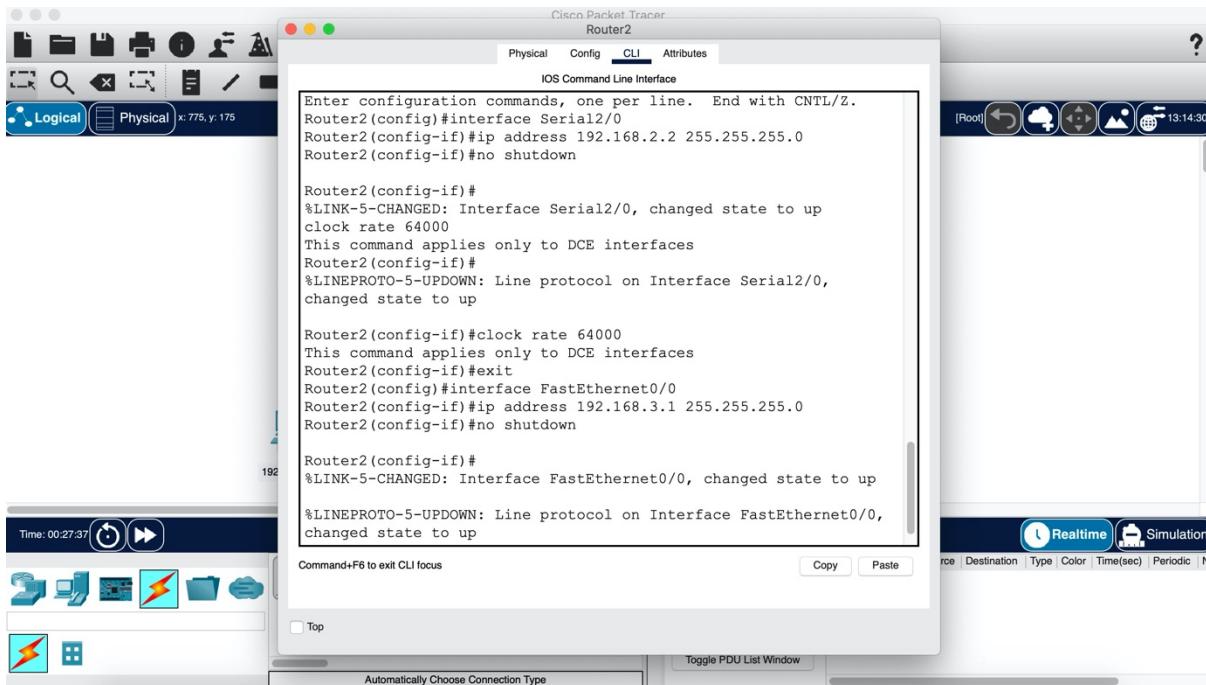
Router1(config-if)#%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router1(config-if)#exit
Router1(config)#exit
Router1#
%SYS-5-CONFIG_I: Configured from console by console

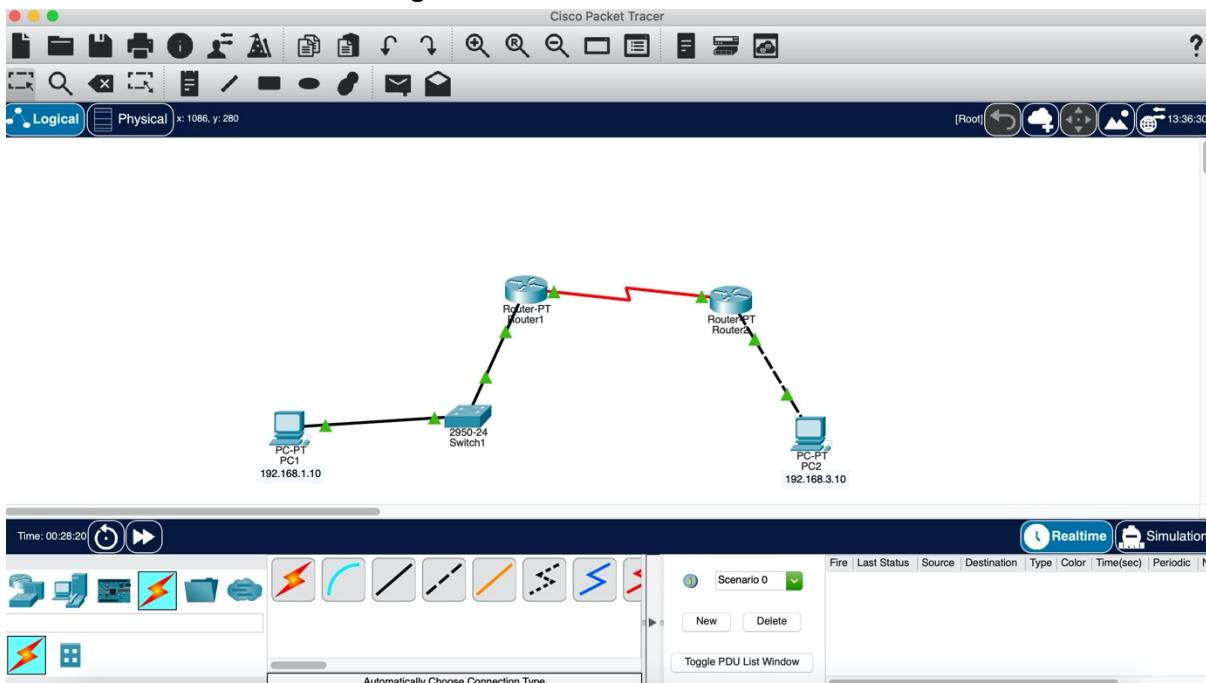
Router1#show ip interface brief
Interface          IP-Address      OK? Method Status
Protocol
FastEthernet0/0      192.168.1.1    YES manual up
FastEthernet1/0      unassigned     YES unset administratively down down
Serial2/0            192.168.2.1   YES manual down
Serial3/0            unassigned     YES unset administratively down down
FastEthernet4/0      unassigned     YES unset administratively down down
FastEthernet5/0      unassigned     YES unset administratively down down
Router1#
```

Practical Lab: Direct and Static Router Configuration - JA

Configure Router 2 using the instructions below:

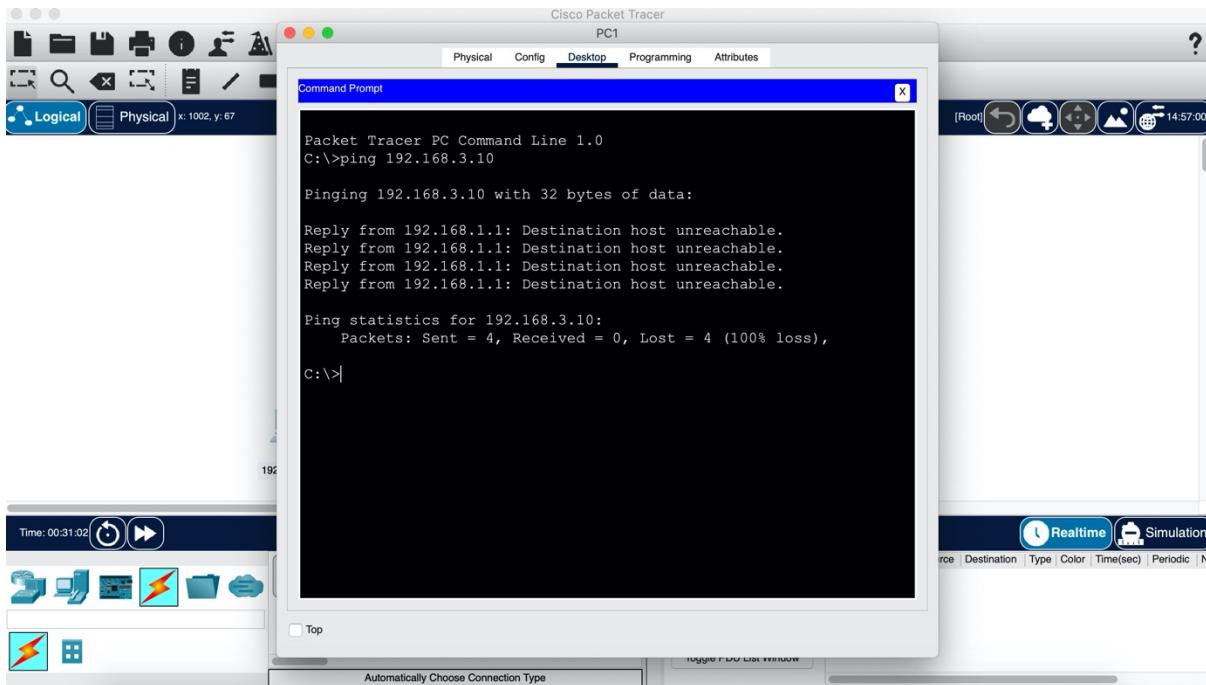


All connections should now be green



Try Pinging PC2 from PC1

Practical Lab: Direct and Static Router Configuration - JA

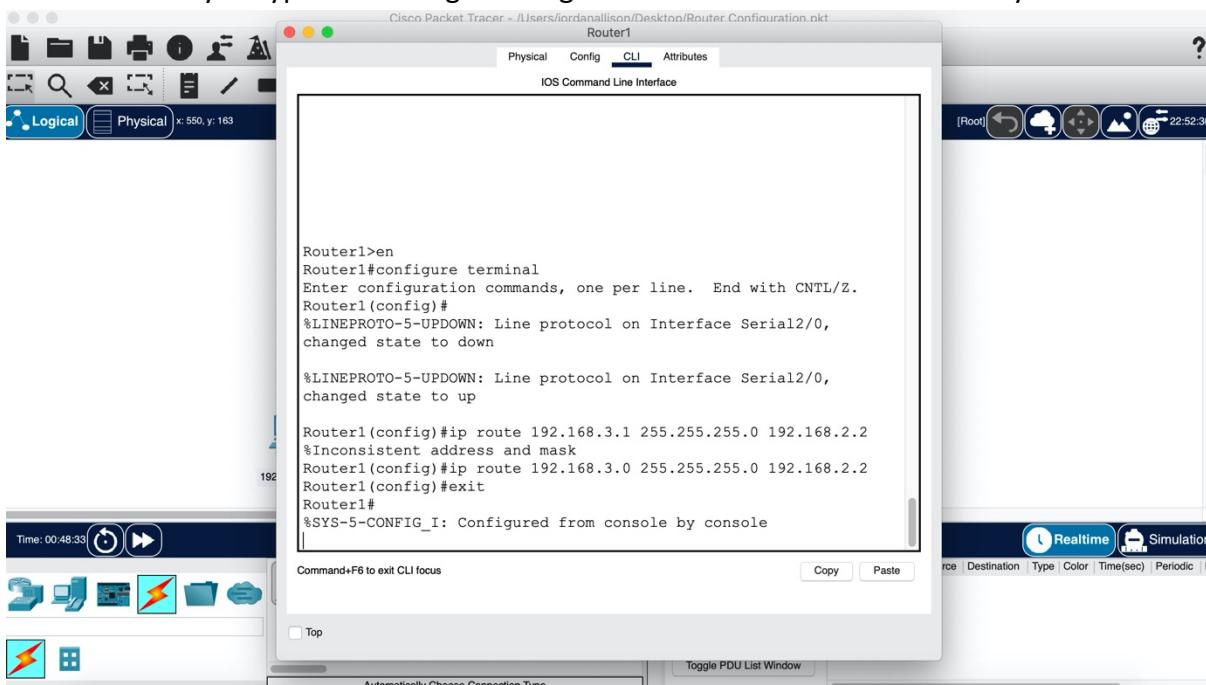


We can't yet, as the destination host is unreachable. We need to add static routes.

6 Adding Static Routes

For Router 1 type: ip route 192.168.3.0 255.255.255.0 192.168.2.2

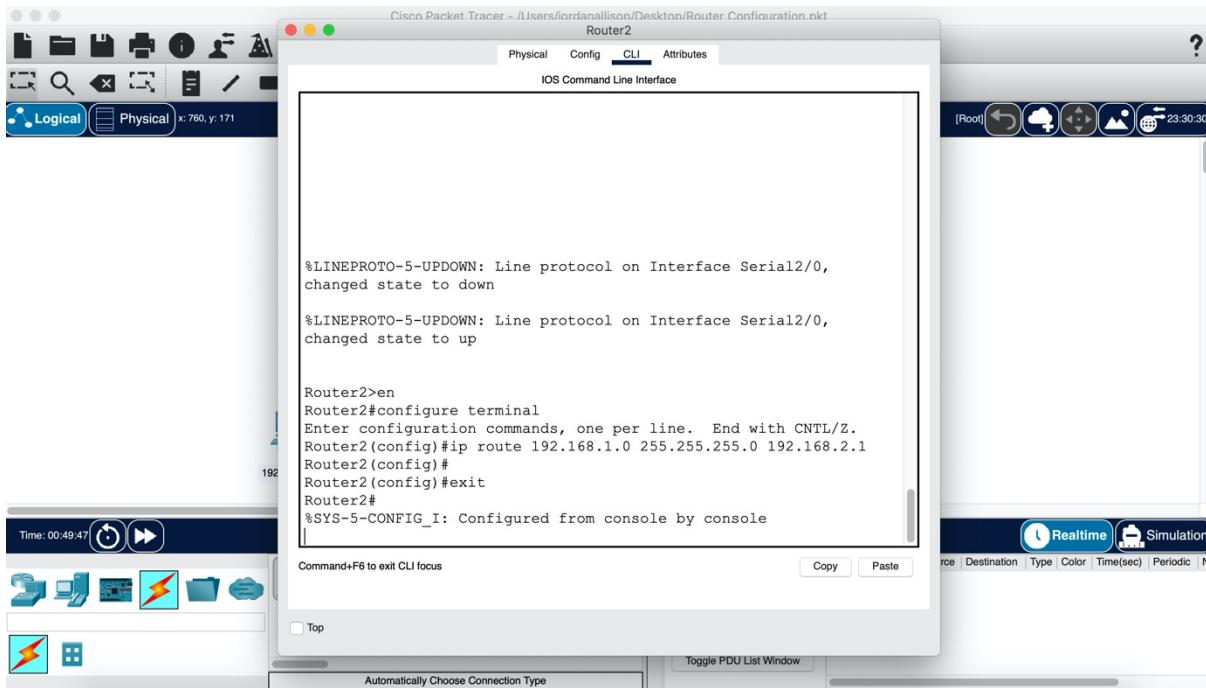
This command instructs Router 1 that when you receive a packet for 192.168.3.0 network give it to 192.168.2.2. If you type something unrecognised or inconsistent it should let you know.



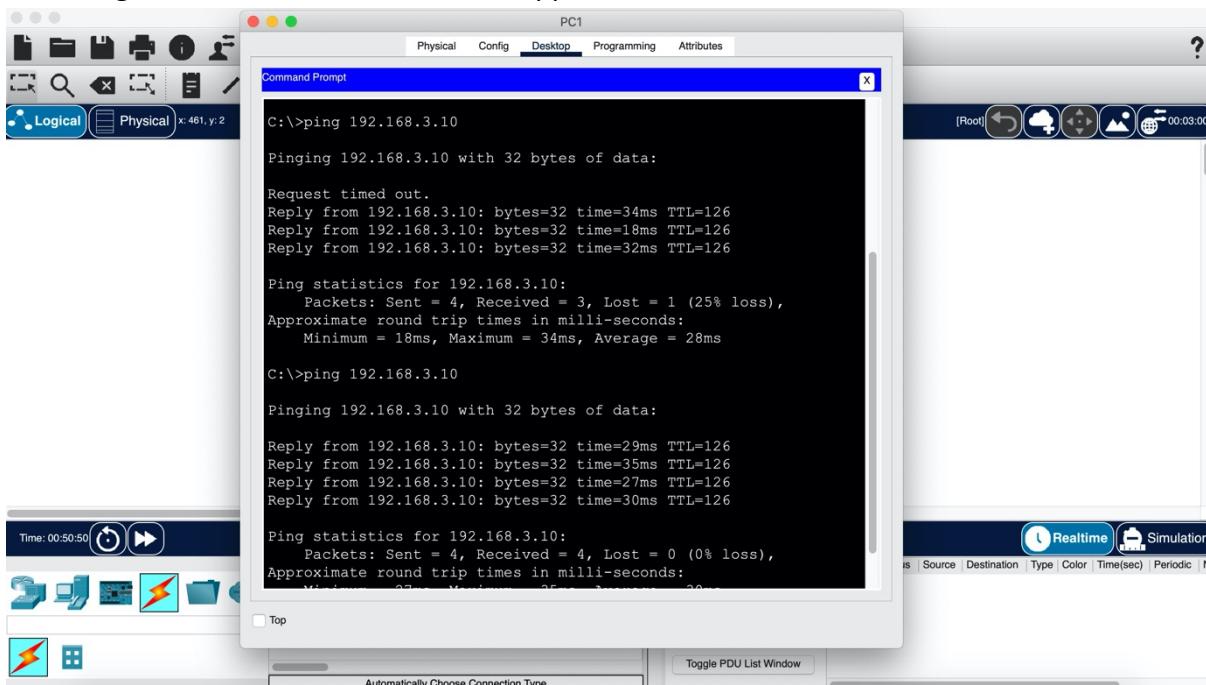
For Router 2 type: ip route 192.168.1.0 255.255.255.0 192.168.2.1

Practical Lab: Direct and Static Router Configuration - JA

This command instructs Router 2 that when you receive a packet for 192.168.1.0 network give it to 192.168.2.1



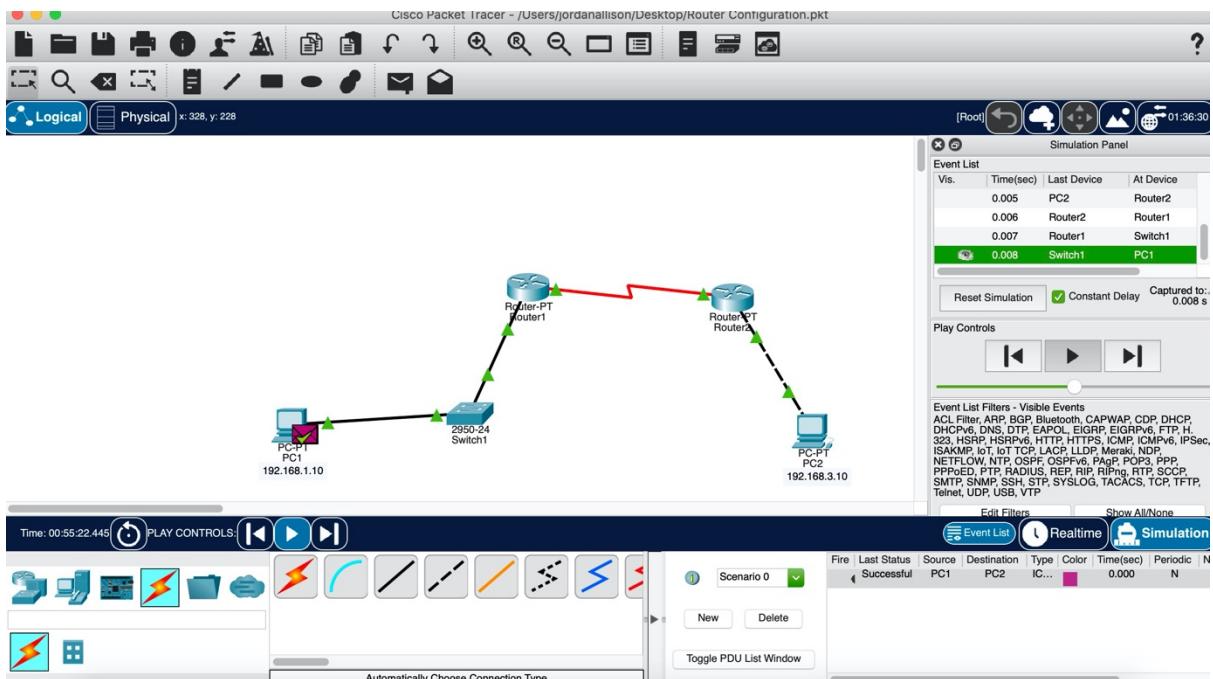
Now Ping PC2 from PC1 and see what happens:



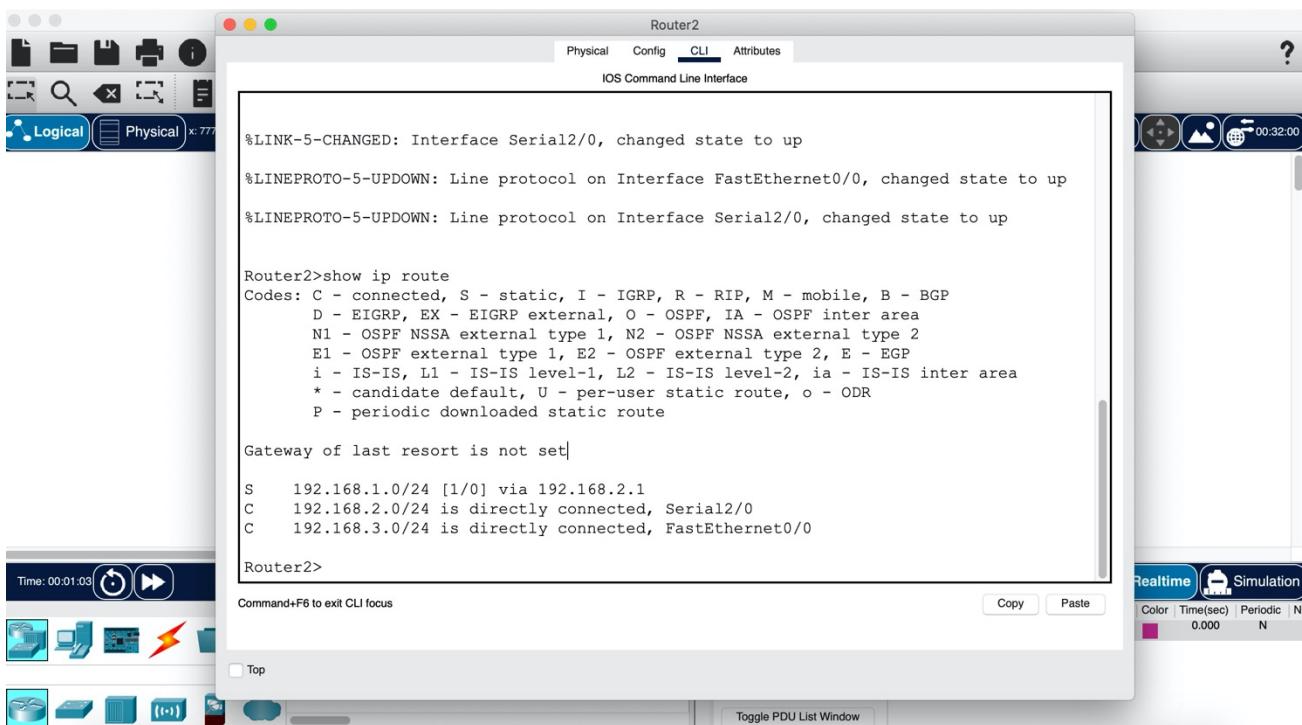
It receives a reply! Our static route has worked.

To visualise this, just run the simulation tool, click on 'Add Simple PDU' then click on PC1, then PC2. Then click on simulation mode and press the play button.

Practical Lab: Direct and Static Router Configuration - JA



Further, if we click on one of our routers and click on CLI and type 'show IP route' we should see three connections as below:



S – Indicates static routes

C – indicates connected routes