

Lab 4

TERM	NAME – Student ID	COURSE CODE	WEIGHT
Summer 2020	Vahid Aghakhani – Vaghakhani1	HWD101	5%

Lab Objectives

Upon completion of this lab, you will be able to perform the following:

- Subnet a network based on network requirements
- Configure IP addressing on network devices
- Configure a router to route traffic from different networks
- Troubleshoot and resolve network connectivity issues

Lab Materials

- Cisco Packet Tracer

Lab Instructions

- Install Cisco Packet Tracer or run application from MyApps
- Launch software and perform lab
- Enter your name and student ID above (Example: david – dtrinh)
- Answer questions and add screenshots into the corresponding textboxes
- Save the file on your computer for future reference
- Save the file again as a “.pdf” file
- Submit the PDF file for grading

Part 1: Network Scenario

You are working for Seneca College's ITS Network team. The School of Information & Communications Technology has increased enrollment over the last 5 years. Due to enrollment increase, the school will split into 2 schools:

- Information and Technology Administration & Security (ITAS)
- Software Design and Data Science (SDDS)

In our scenario, we will require 2 subnets for each school. The existing network is 10.250.20.0/24.

Part 2: ICT Network Topology

1. Using Packet Tracer, create a single network with 8 computers.
 - Router: Model 2811
 - Switch: Model 2960
2. Connect each computer to the switch using an appropriate network cable.
3. Change the display name of the switch to ICT.
4. Connect the switch to the router using an appropriate network cable.



Record the router port used to connect to the switch.

5. Under the router properties, ensure all the ethernet ports are powered on.
6. Configure the 1st available IP address as the router's IP address.
7. Configure an IP address for each PC on the network within the network range.

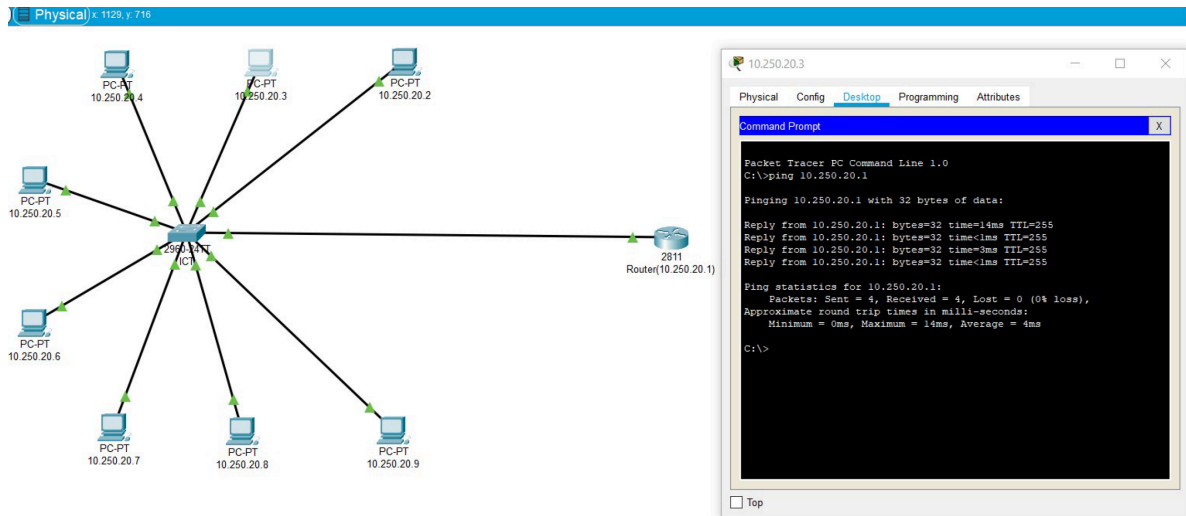


Remember to configure a gateway for each PC.

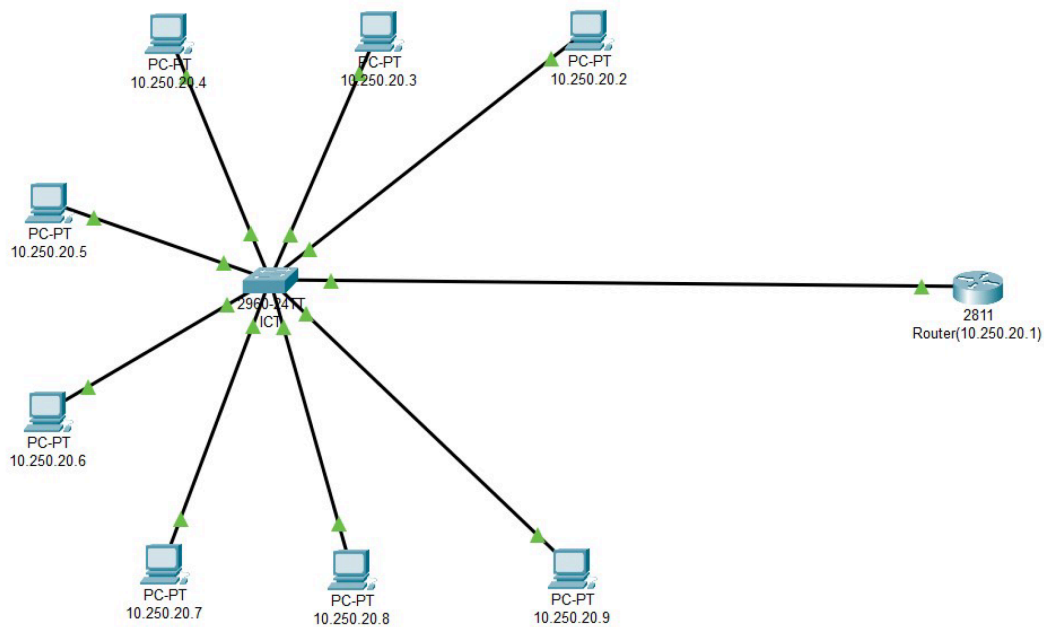
8. Change the display name of each PC to its IP address.
9. Confirm a PC can ping another PC successfully.
10. Confirm a PC can ping the router successfully.



Screenshot 2.0: "ping" response from a PC and router



Screenshot 2.1: ICT Network Topology



Part 3: ITAS / SDDS Network Topology

- Using the existing network of 10.250.20.0/24, subnet this network to support 2 subnets.



Subnet ID for each subnet with correct subnet mask

IP Address	Subnet Mask
10.250.20.0	255.255.255.128
10.250.20.128	255.255.255.128

2. Calculate the valid ranges for each subnet.

**Ranges for each subnet**

Subnet	First available IP	Last available IP
10.250.20.0/25	10.250.20.1	10.250.20.126
10.250.20.128/25	10.250.20.129	10.250.20.254

The school of ITAS will use Subnet #1 and SDDS will use Subnet #2. ITAS will use the first available IP address for their gateway. SDDS will use the last available IP address for their gateway.

1. Add another switch [model 2960] and reconnect 4 PCs to this switch.
2. Change the display name of this switch to “SDDS”.
3. Change the display name of “ICT” to “ITAS”.
4. Connect the switch “SDDS” to the router using an appropriate network cable.

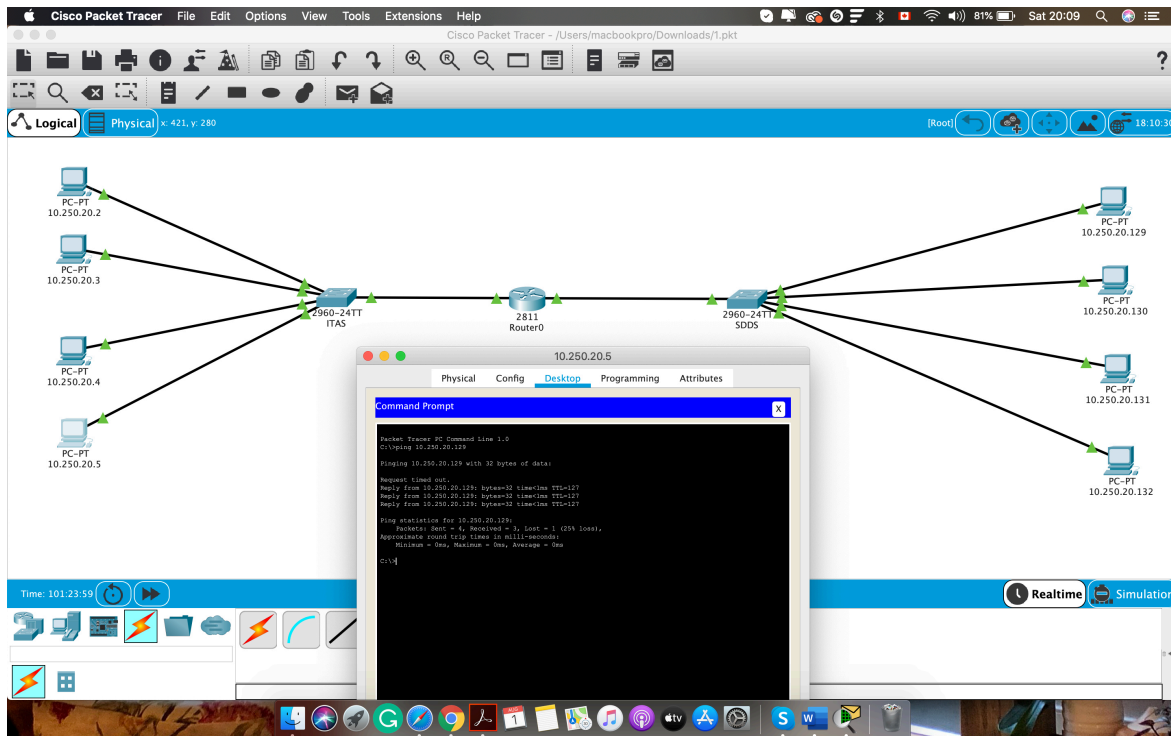
**Record the router port used to connect to the switch.****ITAS Network**

1. Recalling the router port used for the ICT network, configure this port with the first available IP address for Subnet #1.
2. Configure each PC with an appropriate IP address.
3. Change the display name of each PC to its IP address.

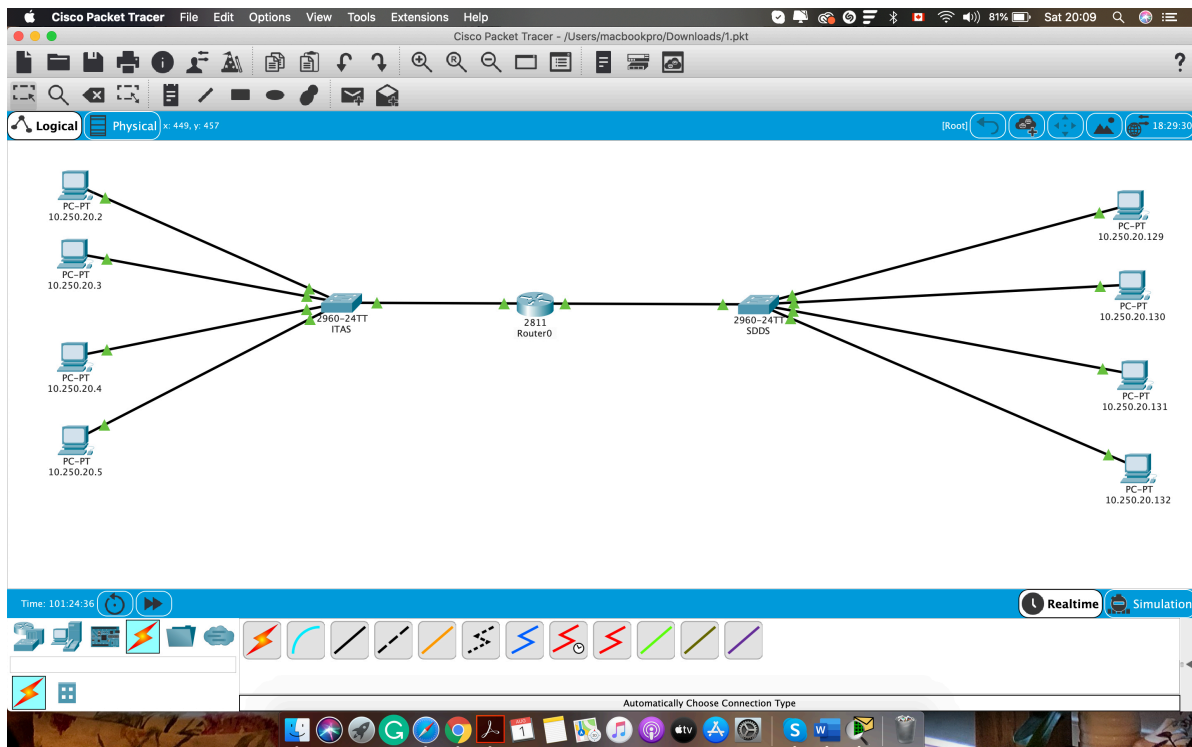
SDDS Network

1. Recalling the router port used for the SDDS network, configure this port with the last available IP address for Subnet #2.
2. Configure each PC with an appropriate IP address.
3. Change the display name of each PC to its IP address.

**Screenshot 3.0: “ping” response from a ITAS PC to a SDDS PC**



Screenshot 3.1: ITAS / SDDS Network Topology



Part 4: Subnetting ITAS Network

The school of ITAS has decided to divide their department into 2 sub-schools:

- Technology Administration (TA)
- Information Security (IS)

1. Using the existing network of 10.250.20.0/25, subnet this network to support 2 subnets.

 Subnet ID for each subnet with correct subnet mask

IP Address	Subnet Mask
10.250.20.0	255.255.255.192
10.250.20.64	255.255.255.192

2. Calculate the valid ranges for each subnet.

 Ranges for each subnet

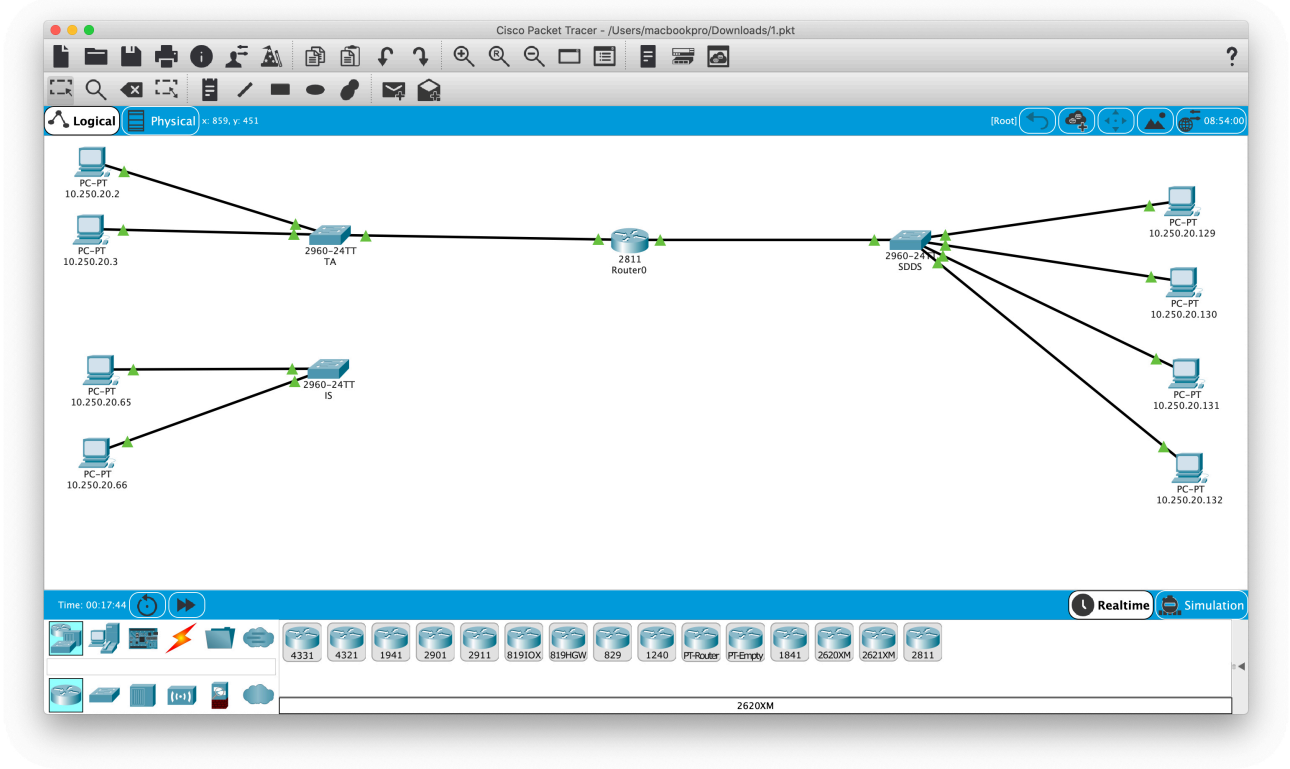
Subnet	First available IP	Last available IP
10.250.20.0	10.250.20.1	10.250.20.62
10.250.20.64	10.250.20.65	10.250.20.126

The school of TA will use Subnet #1 and IS will use Subnet #2. TA will use the first available IP address for their gateway. IS will use the last available IP address for their gateway.

5. Add another switch [model 2960] and reconnect 2 PCs to this switch.
6. Change the display name of this switch to “IS”.
7. Change the display name of “ITAS” to “TA”.
8. Connect the switch “IS” to the router using an appropriate network cable.

 Due to the limited ports on the router, we cannot connect “IS” to the router.

 Screenshot 4.0: Current TA / IS / SDDS Network topology



We have a few options to resolve this issue:

1. Replace the router
 - This can be done without routing.
2. Introduce another router
 - This will require us to understand routing (next lesson).

Part 5: Replacing the router

SDDS Network

1. Remove the existing router and replace it with the 2911 router.
2. Reconnect the SDDS network to the router.

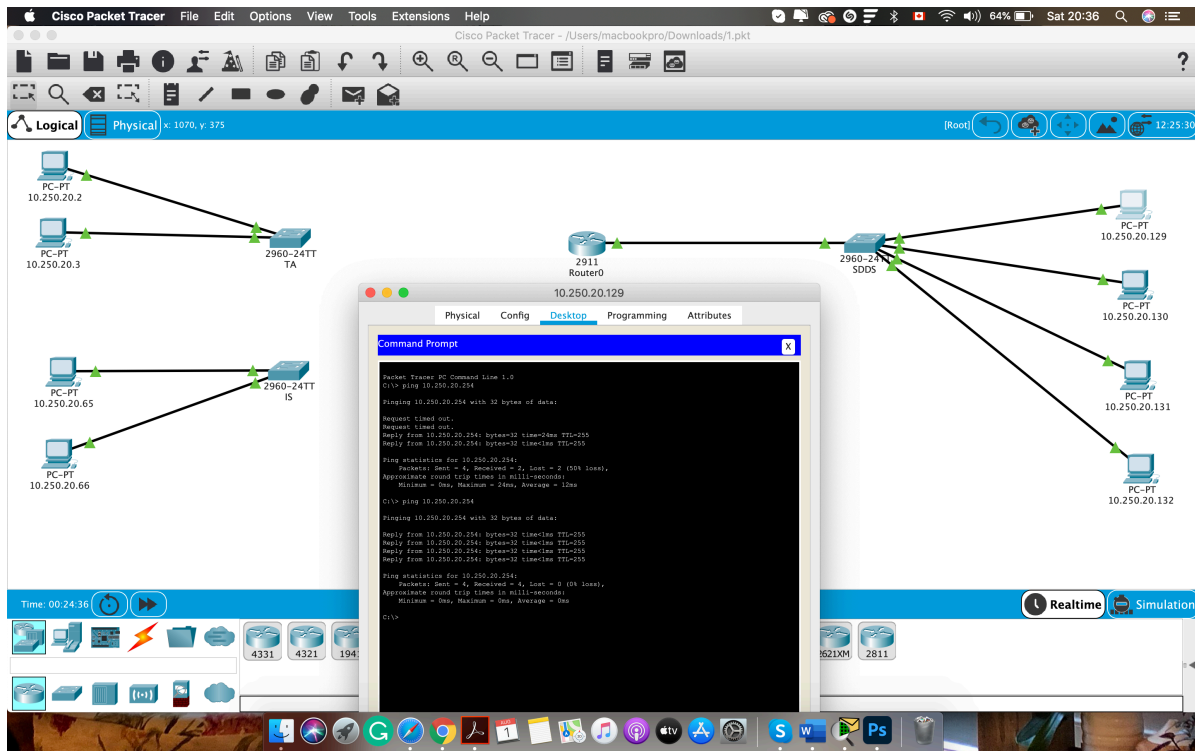


Remember to power on all the ports on the router.

3. Under the router properties, configure the port connecting to the SDDS network with the same IP address used before.
4. Confirm the SDDS PCs can ping the router and each other.



Screenshot 5.0: “ping” response from SDDS PC to router.

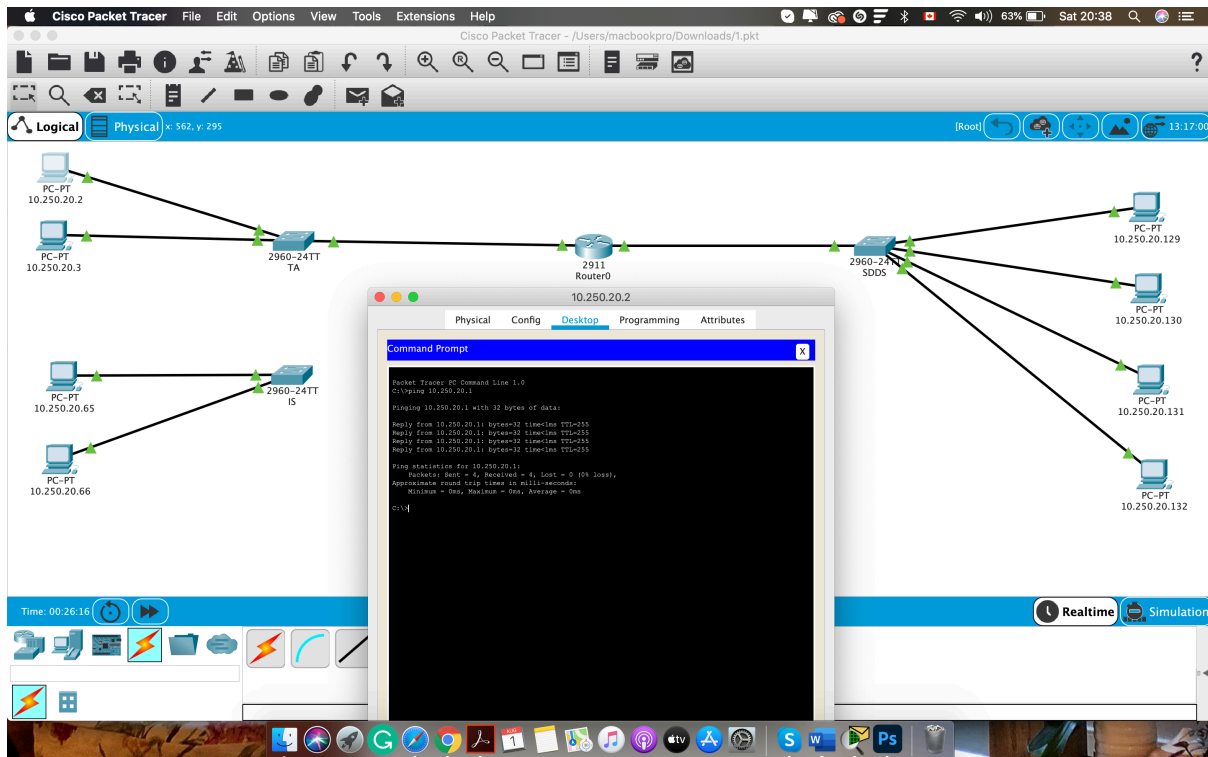


TA Network

1. Reconnect the TA switch to the router.
2. Under the router properties, configure the port connecting to the TA network with the IP address specified earlier.
3. Update the PCs IP configuration with the new subnet and gateway information.
4. Confirm the TA PCs can ping the router and each other.



Screenshot 5.1: “ping” response from TA PC to router.

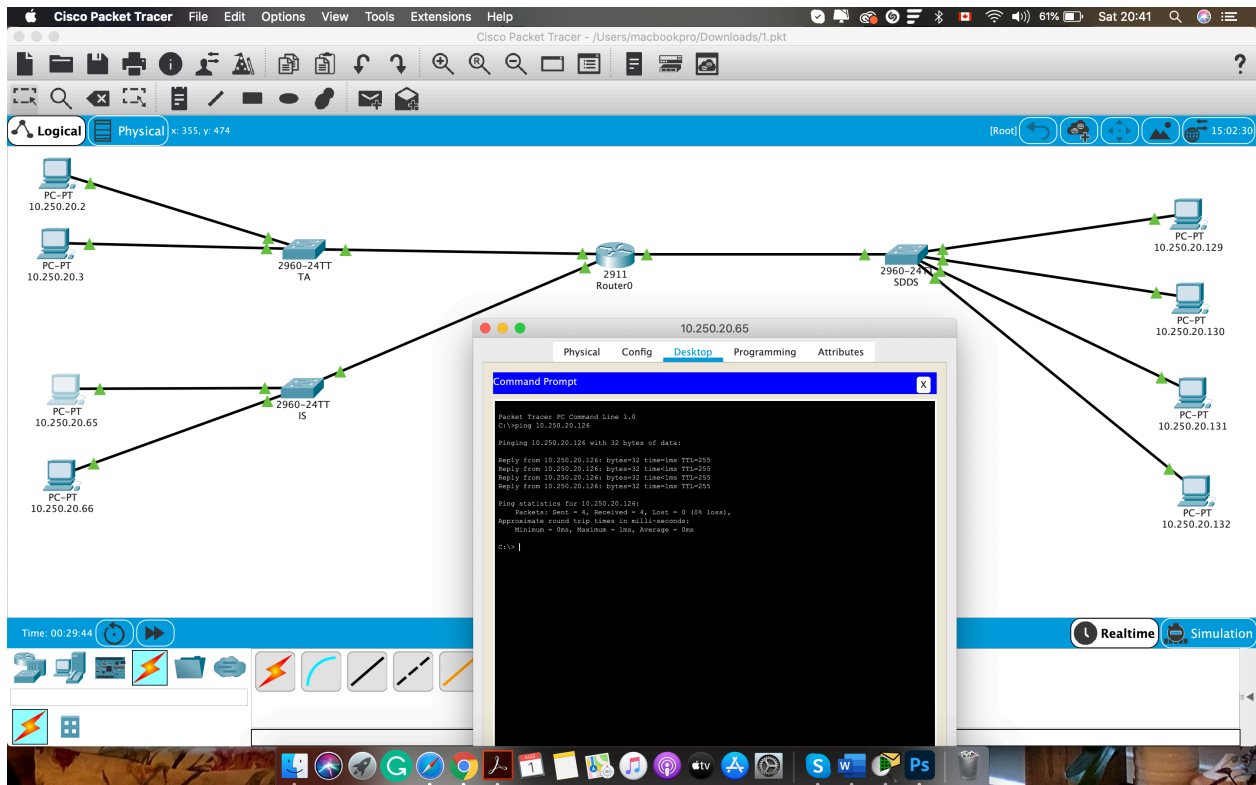


IS Network

1. Connect the IS switch to the router.
2. Under the router properties, configure the port connecting to the IS network with the IP address specified earlier.
3. Update the PCs IP configuration with the new subnet and gateway information.
4. Confirm the IS PCs can ping the router and each other.



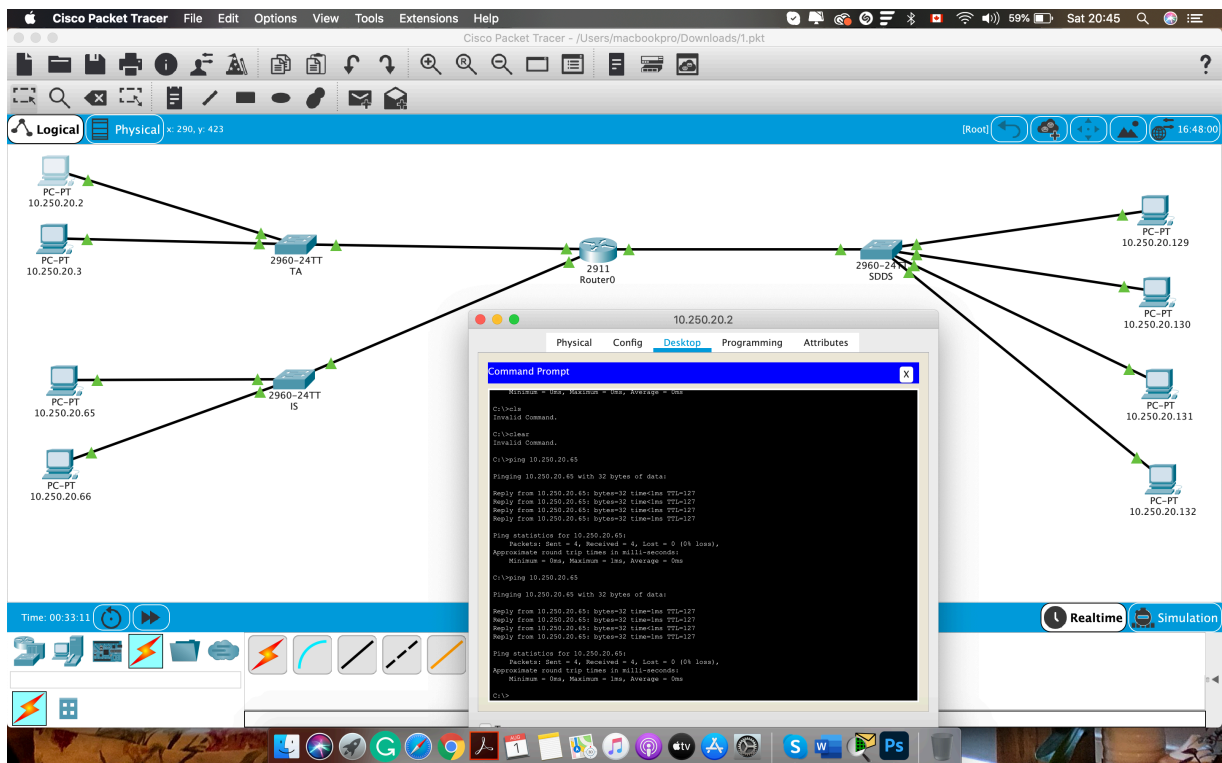
Screenshot 5.2: “ping” response from IS PC to router.



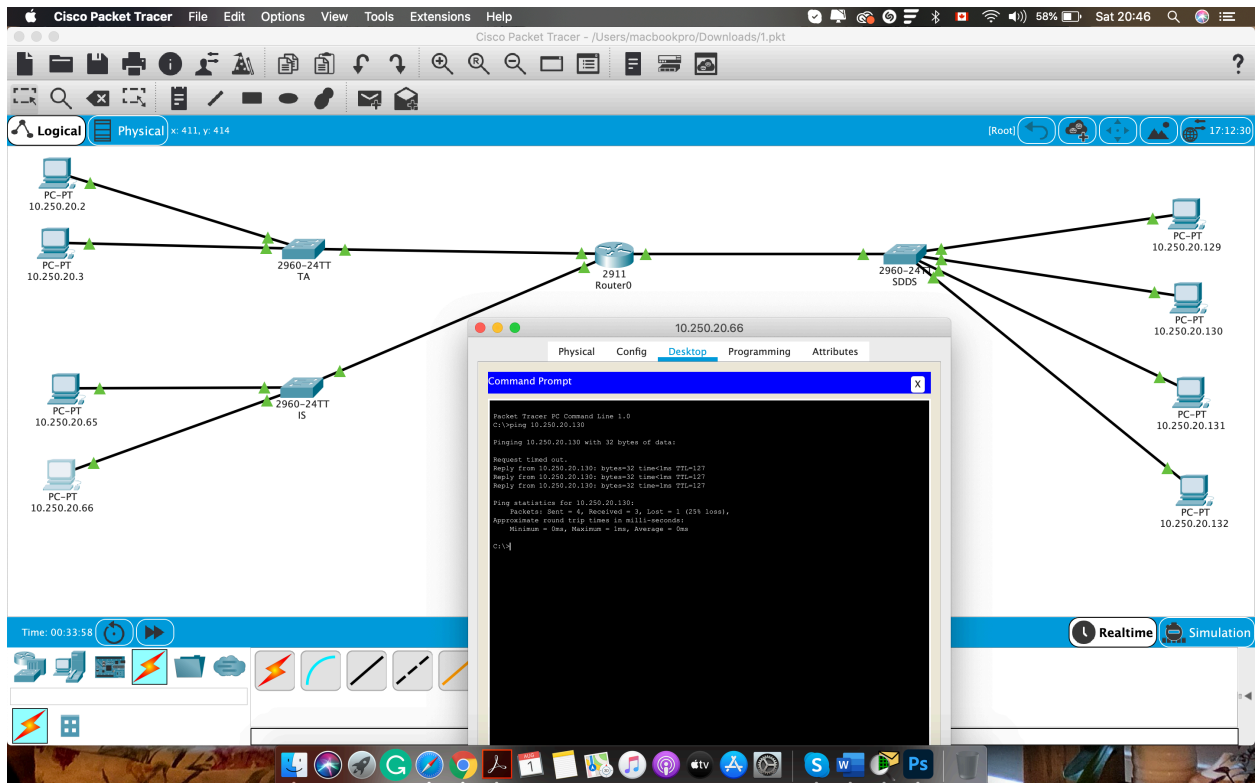
Confirm each PC on different networks can “ping” each other.



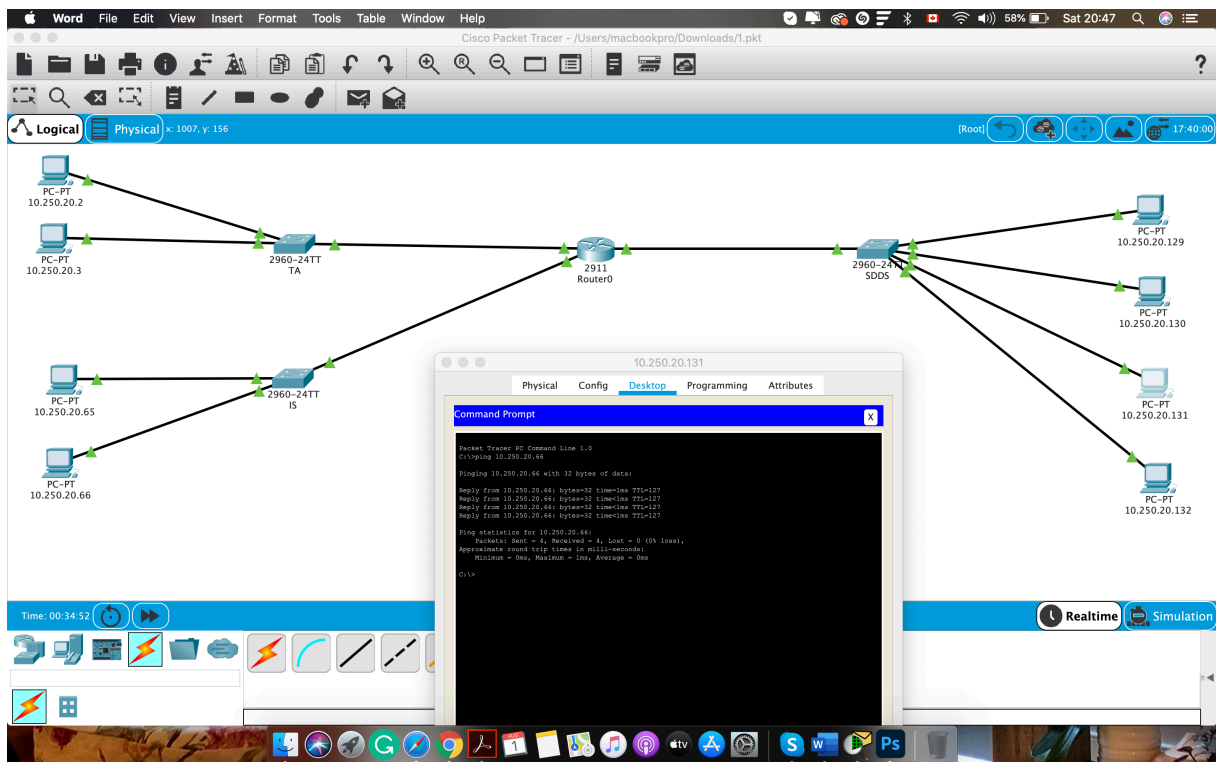
Screenshot 5.3: “ping” response from TA PC to IS PC.



Screenshot 5.4: “ping” response from TA PC to SDDS PC.



Screenshot 5.5: “ping” response from SDDS PC to IS PC.



Save the Packet Tracer file. This file will be used for the next lab.