ASSUMPTION UNIVERSITY

FACULTY OF ENGINEERING

COMPUTER ENGINEERING

CE4224 TELECOMMUNICATION NETWORK LABORATORY
SECTION 641
SEMESTER 2/2022

WEEK3
STATICS ROUTING AND SERIAL INTERFACE

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Introduction

Static route

- A static route is created, maintained, and updated by a network administrator, manually.
- A static route to every network must be configured on every router for full connectivity.
- Static routing is a form of routing that occurs when a router uses a manually configured routing entry, rather than information from dynamic routing traffic. In many cases, static routes are manually configured by a network administrator by adding in entries into a routing table, though this may not always be the case. Unlike dynamic routing, static routes are fixed and do not change if the network is changed or reconfigured. Static routing and dynamic routing are not mutually exclusive. Both dynamic routing and static routing are usually used on a router to maximize routing efficiency and to provide backups in case dynamic routing information fails to be exchanged. Static routing can also be used in stub networks, or to provide a gateway of last resort.
- Synchronous Communication

In the lab, to synchronize the clocks on the serial interfaces of both routers on the ends of a serial link, one end must provide clocking. DCE side determined by cable add clocking to DCE side only.

- Setting Clock Rate Setting clock rate on a router's serial interface is required when you want to use a back-to-back WAN connection. When two routers are connected one must supply the clocking for communication with each other. Setting clock rate is important for synchronization as each clock pulse signals the transmission of a bit.

It is important to know the process of setting clock rate on router's serial interface from CCNA exam perspective and network labs, but in real world almost every network provider delivers clock signal which does not require setting any clock rate on router at the customer end.

```
Router1(config)# interface serial 0/0/0
Router1(config-if)#clock rate ?
Speed (bits per second)
1200
2400
4800
9600
19200
38400
56000
64000
72000
125000
128000
148000
250000
500000
800000
1000000
1300000
```

2000000
4000000
<300-4000000> Choose clockrate from list above

UpaaeRouter1> enable
UpaaeRouter1# configure terminal
UpaaeRouter1(config)#
UpaaeRouter1(config)# interface serial 0/0/0
UpaaeRouter1(config-if)# clock rate 64000
UpaaeRouter1(config-if)# end

- Serial interface

A serial interface is a communication interface between two digital systems that transmits data as a series of voltage pulses down a wire. A "1" is represented by a high logical voltage and a "0" is represented by a low logical voltage. Essentially, the serial interface encodes the bits of a binary number by their "temporal" location on a wire rather than their "spatial" location within a set of wires. Encoding data bits by their "spatial" location is referred to as a parallel interface and encoding bits by their "temporal" location is referred to as a serial interface. Figure 3 graphically illustrates the difference between these two communication methods.

A key issue with a serial interface is knowing where the data is on the wire. As an example, let's assume that the wire is initially at a low logical level. We'll refer to this as the idle channel condition. If we now transmit a string of zeros down the wire, how can we distinguish between the string of zeros and the idle channel condition?

The answer to our dilemma lies in creating a protocol. A protocol is an agreement between two parties about how the two parties should behave. A communication protocol is a protocol about how two parties should speak to each other. Serial communication protocols assume that bits are transmitted in series down a single channel. A serial protocol has to address the following issues

How does the receiver know when to start looking for information?
When should the receiver look at the channel for the information bits?
What is the bit order? (MSB or LSB first)
How does the receiver know when the transmission is complete?

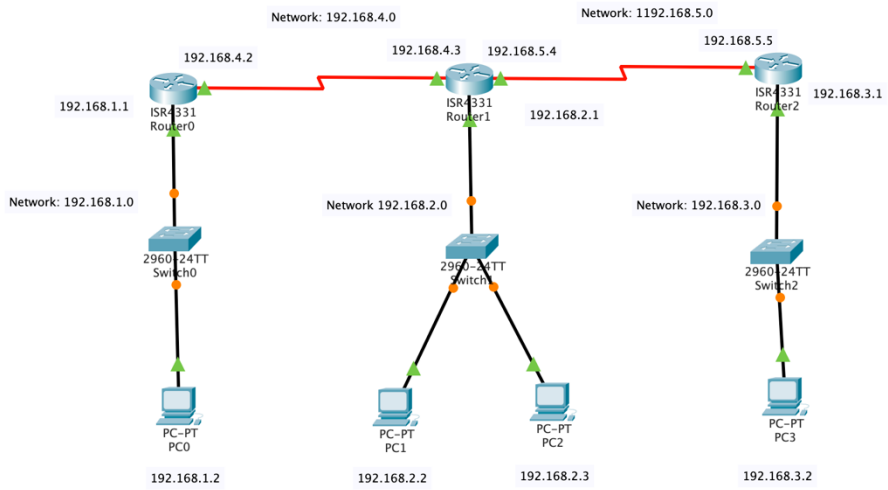
These issues can be addressed in a variety of ways, but we can usually identify two distinct approaches. The first approach is embodied in synchronous serial interfaces (usually abbreviated as SPI) and the second is in asynchronous serial interfaces (usually abbreviated as SCI). Asynchronous serial links are commonly used to communicate between two computers. You used the SCI interface when you used OutString to write out characters to the PC's terminal window. The synchronous serial link (SPI) is used when you transmit data between devices that may not have an internal clock. The SPI interface is what you'll use in this lab because the parallel-to-serial shift register you're using has no internal clock.

Apparatus

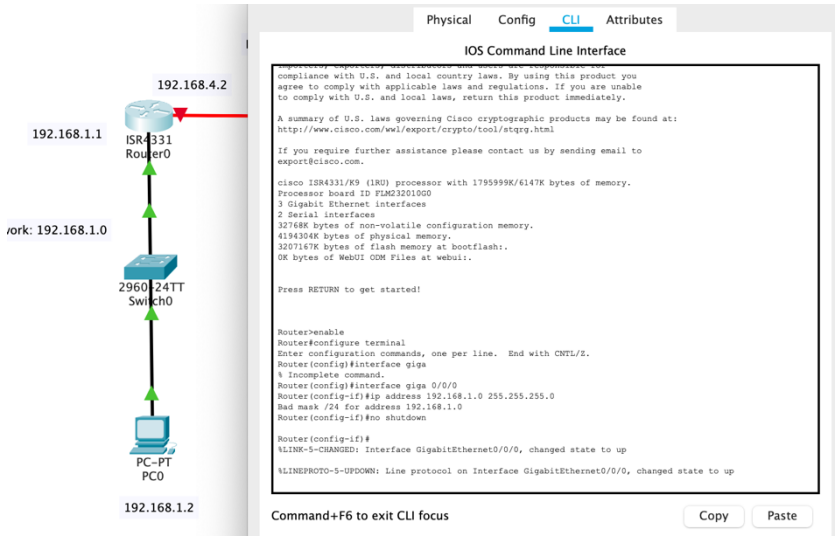
- Laptop
- Cisco Packet Tracer

Procedure

1. Make the topology of 3 networks connected by Ethernet port, 4 PCs and 3 switches

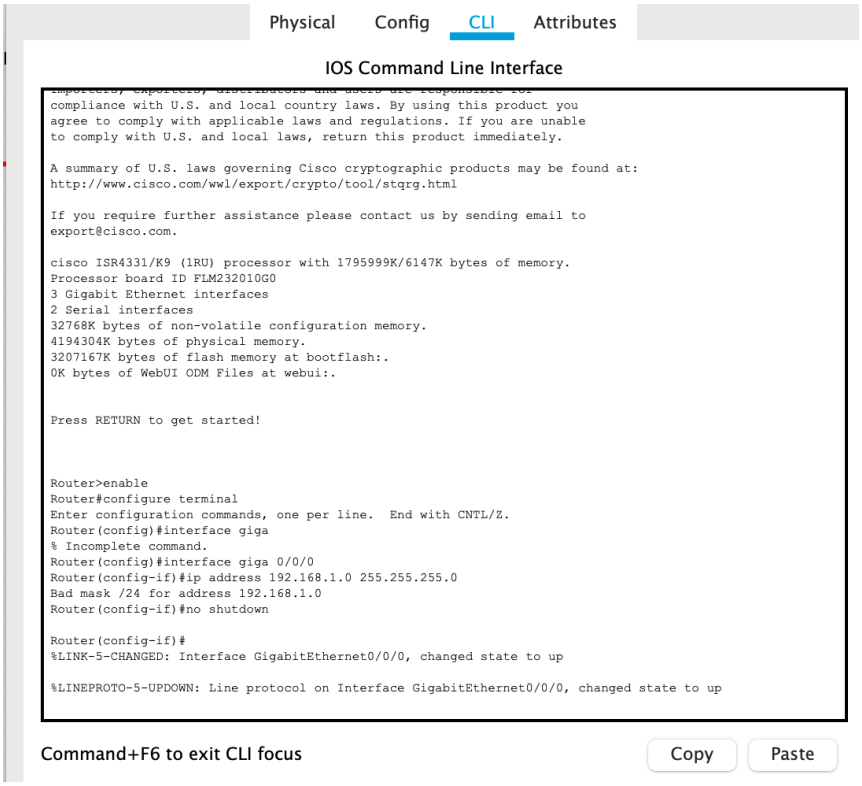


2. 5 Networks 192.168.10 – 194.168.5.0

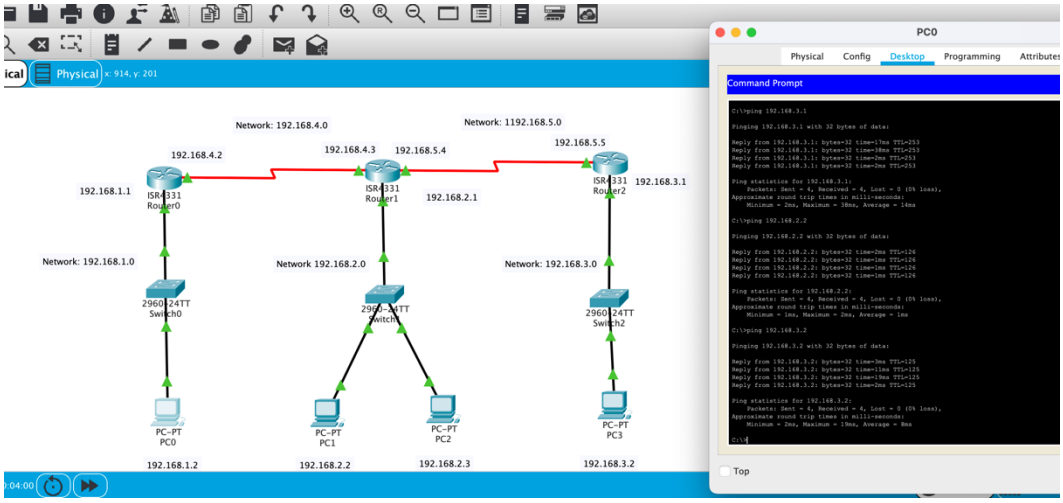


3. Draw an addressing table for the network given above

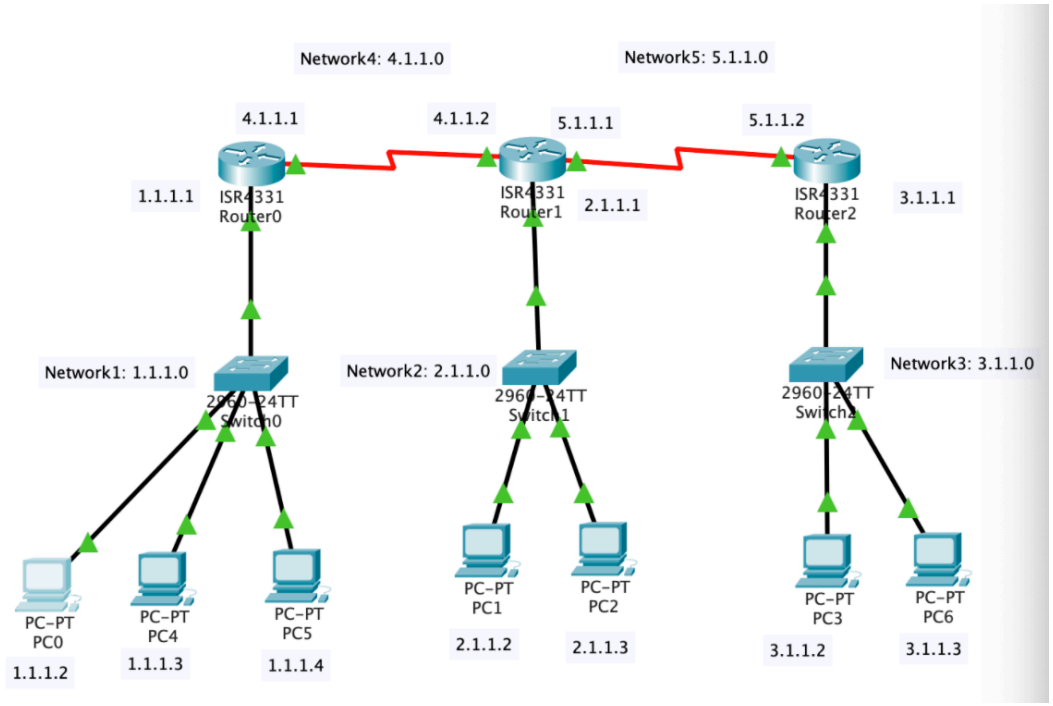
4. Write the commands in your CLI of the router and configure

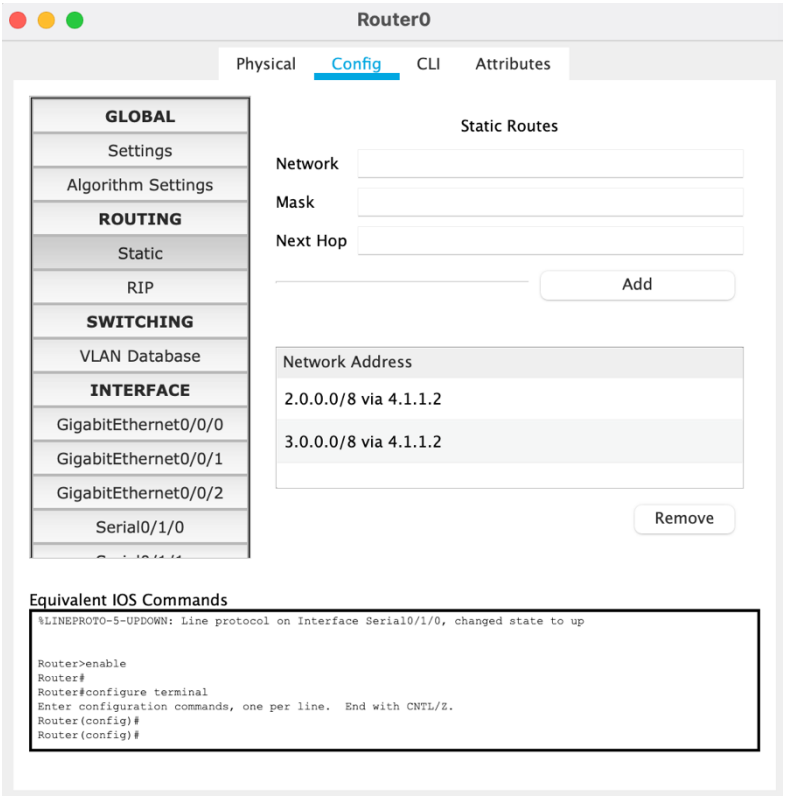


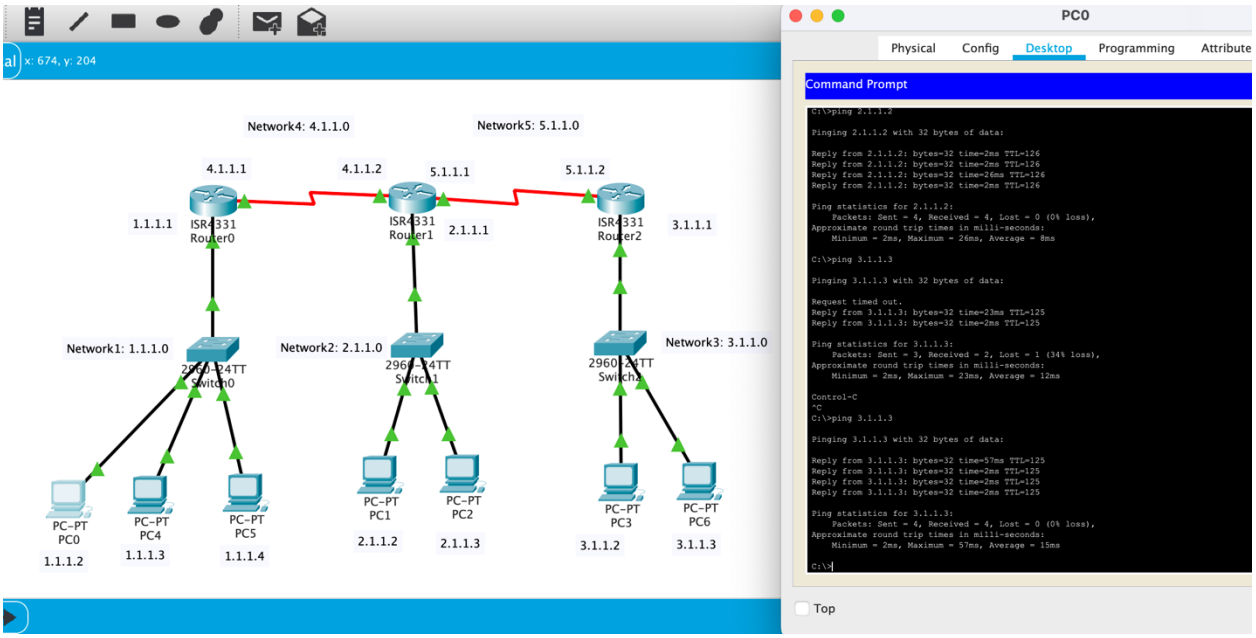
5. Verify your connection Ping



Practice Question







Conclusion

In this experiment, I have learned about how to connect 3 Network and setting clock rate and the function more clearly especially about the IP address and how to connect the network by using static routing and it easier than using command in CLI and I did it more advance by connecting between three router and try to connect in each other which make me more understand about the gate in and out of network.