Router Configuration and Static Routing

CS F303

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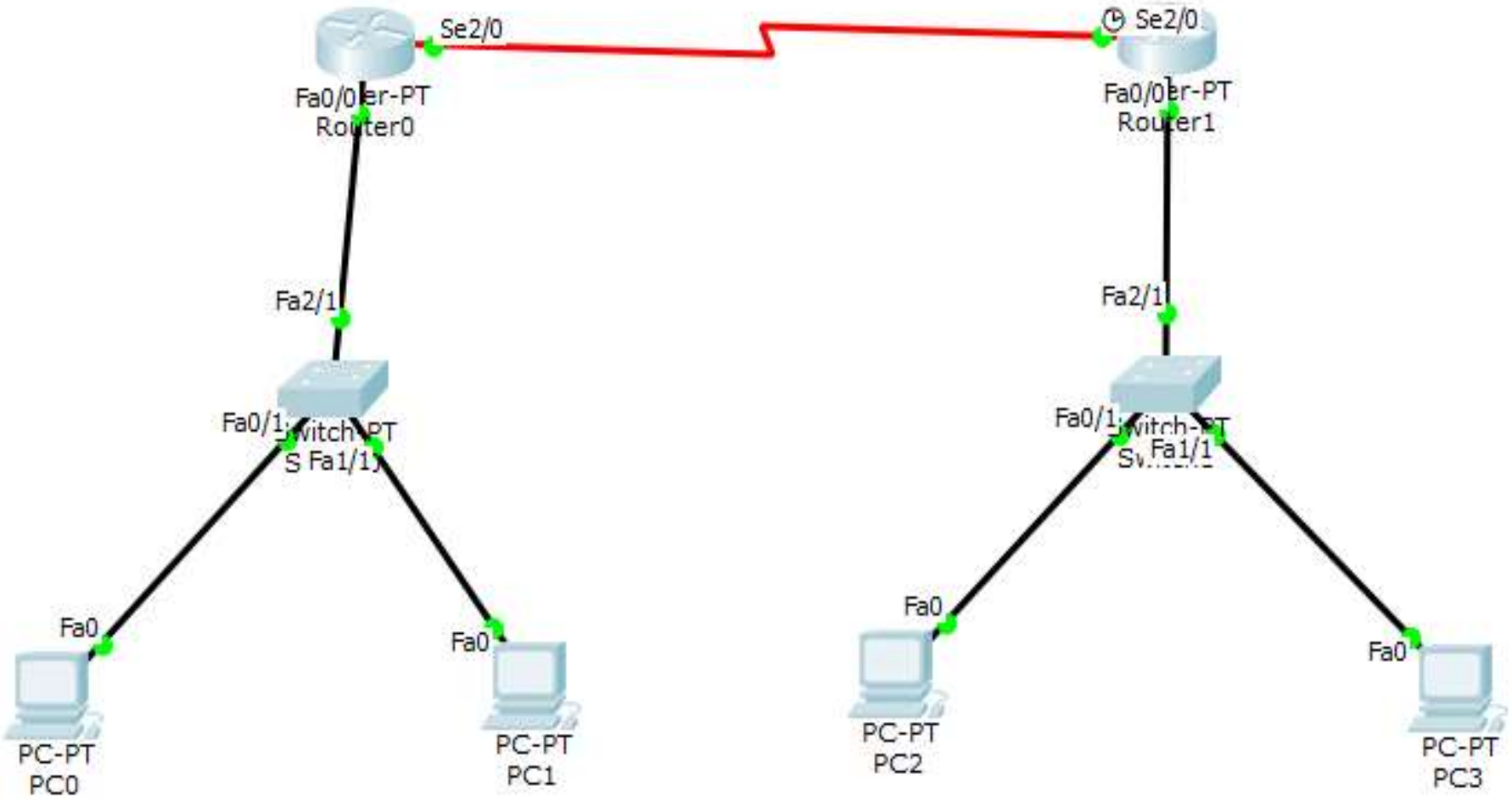
Packet Tracer

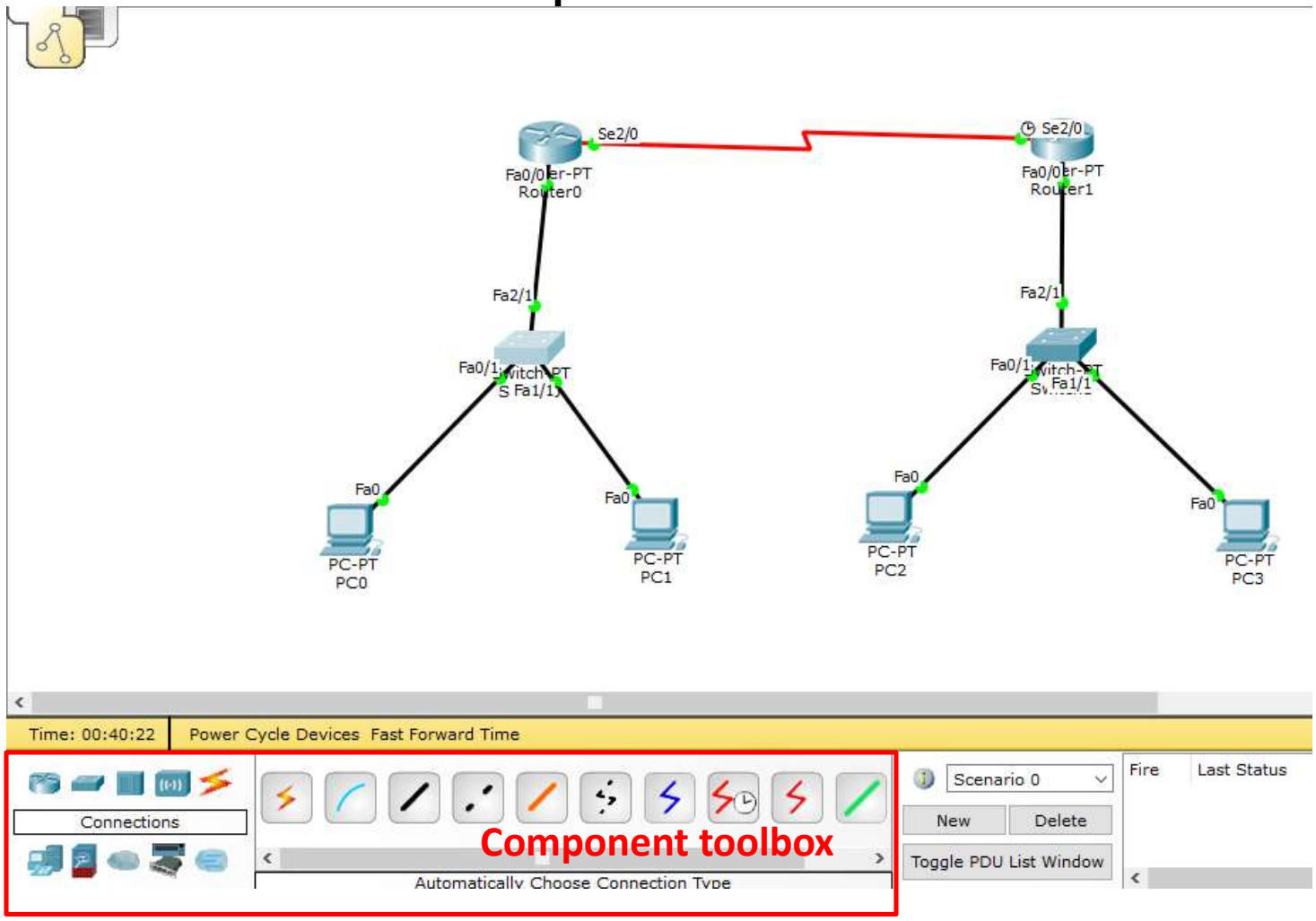
- Packet Tracer is a program used to illustrate how computer networks work.
- Packet Tracer has two different views
  - Logical Workspace
  - Physical Workspace
- Packet Tracer also has two modes of operation
  - Realtime Mode
  - Simulation Mode

Topology


Se2/0
Se2/0
Fa0/0
Router0
Fa0/0
Router1
Fa2/1
Fa2/1
Fa0/1
Fa1/1
Fa0/1
Fa1/1
Fa0
Fa0
Fa0
Fa0
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3

Create Network

- Drag and drop the required components from the Packet Tracer component toolbox

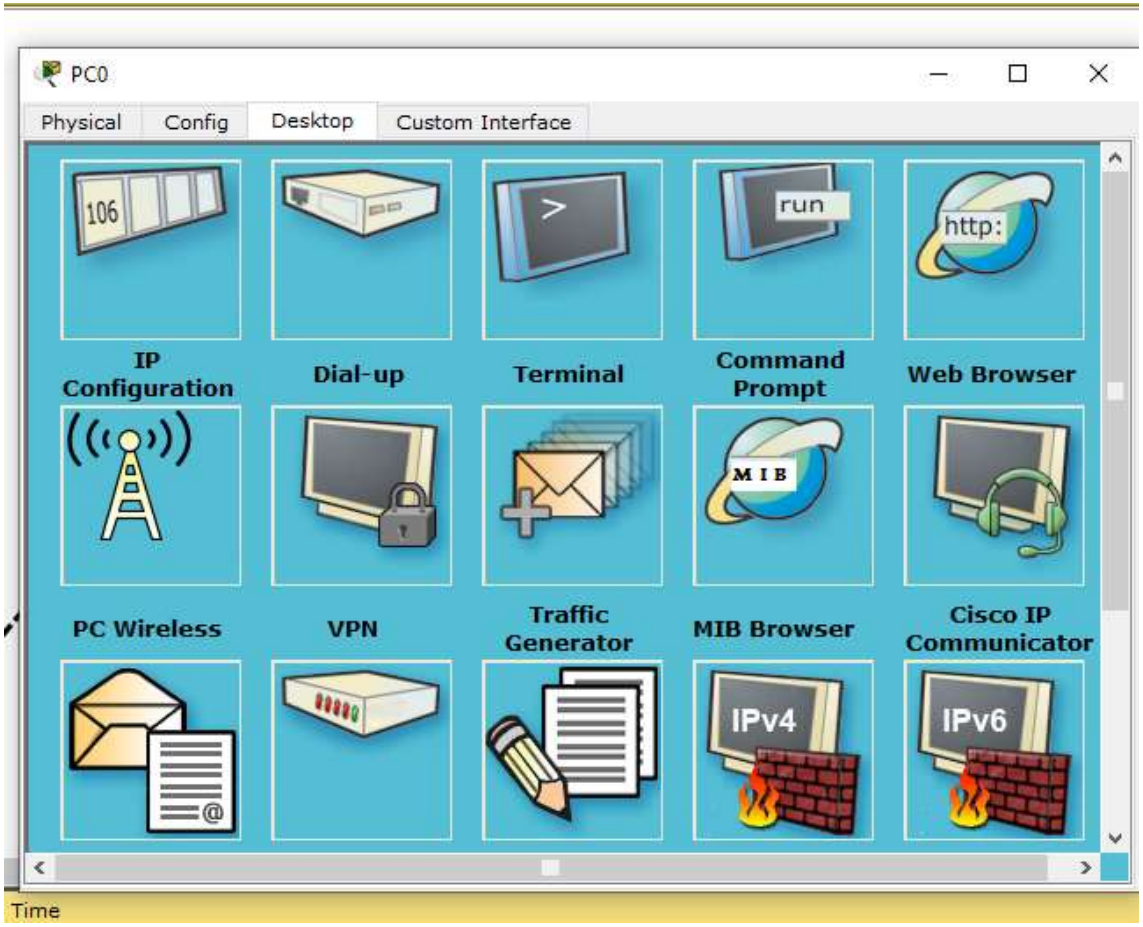


Assign addressed to Connections

Device	Connected from	Connected to	IP Address
PC0	FastEthernet 0	Switch0 FastEthernet 0/1	10.0.0.2
PC1	FastEthernet 0	Switch0 FastEthernet 1/1	10.0.0.3
Router0 (Gateway)	Switch0 FastEthernet 2/1	Router0's FastEthernet 0/1	10.0.0.1
Router0	Serial 2/0	Router1's Serial 2/0	192.168.0.253
Router1	Serial 2/0	Router0's Serial 2/0	192.168.0.254
Router1 (Gateway)	Switch1 FastEthernet 2/1	Router1's FastEthernet 0/1	20.0.0.1
PC2	FastEthernet 0	Switch1 FastEthernet 0/1	20.0.0.2
PC3	FastEthernet 0	Switch1 FastEthernet 1/1	20.0.0.3

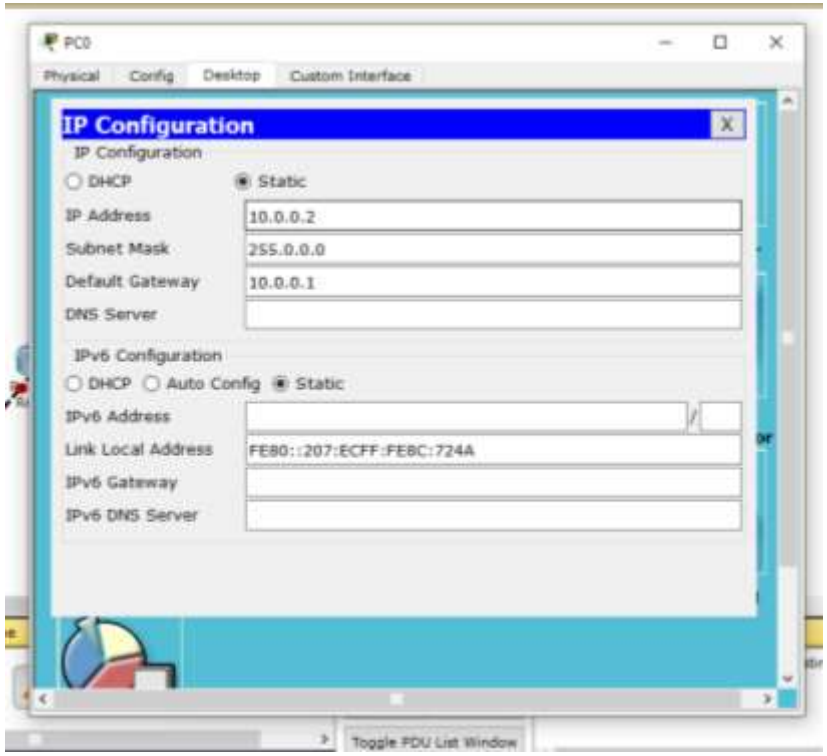
Assign IP Address PC (1)

- Assign IP address to PC0.
  - Step 1: Click on PC0, we will get following window.



Assign IP Address PC (2)

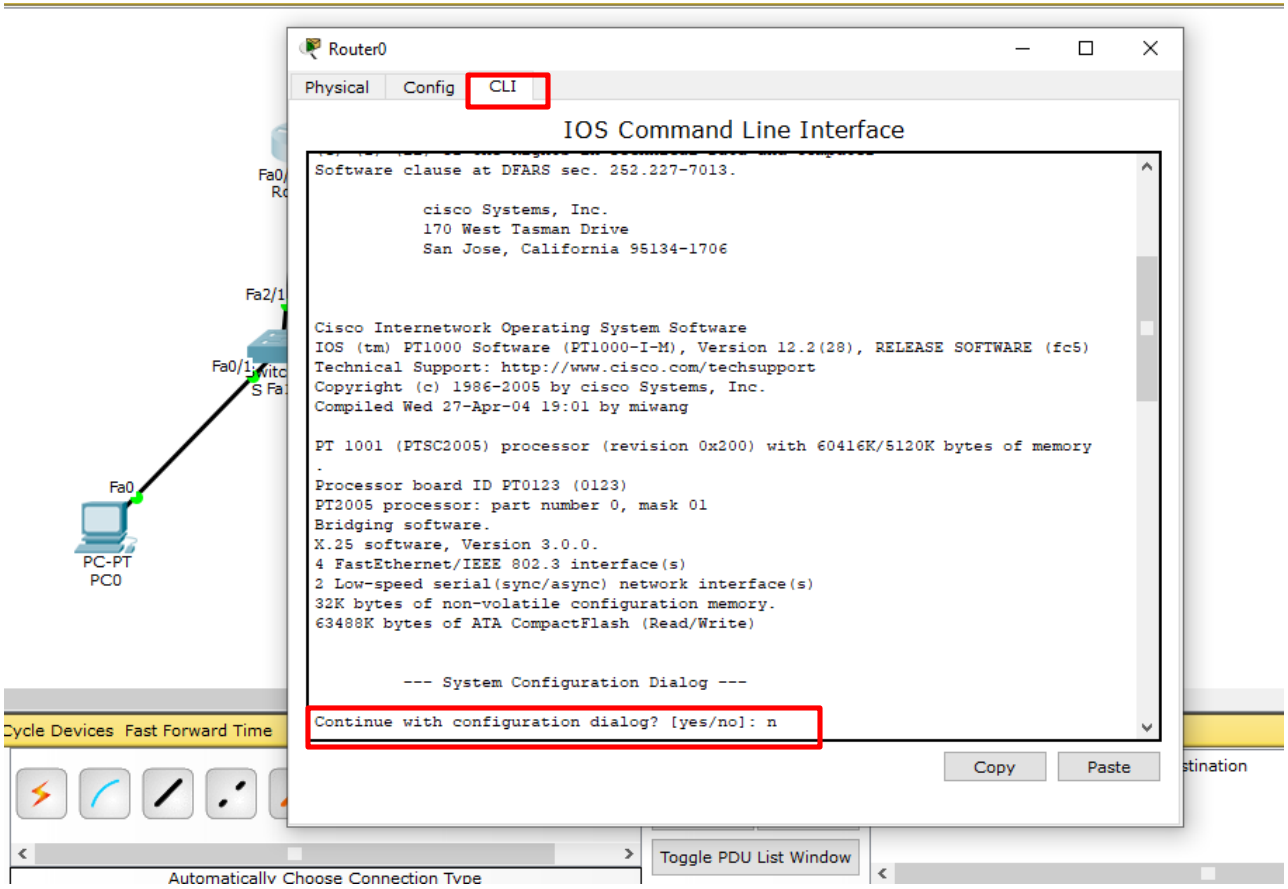
- Assign IP address to PC0.
  - Step 2: Click on IP configuration and set the IP address, subnet mask and gateway address.



- Assign IP address to PC1, PC2, and PC3 in same way.

Configuring Router 0 (1)

- Step1: Double click Router0 and click CLI and press Enter key to access the command prompt of Router0.



- Press N in Continue with configuration dialog? [yes/no]:

Configuring Router (2)

- Step 2: Use following commands to configure Router 0, FastEthernet 0/0 interface.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet 0/0
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#exit
Router#
```

Configuring Router 0 (2)

Step 2: Use following commands to configure Router 0, Serial 2/0 interface.

```
Router#configure terminal
Router(config)#interface Serial2/0
Router(config-if)#ip address 192.168.0.253 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#exit
Router#
```

Configuring Router 1

- In same way, Configure Serial 2/0 and FastEthernet 0/0 interface.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#ip address 192.168.0.254 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#exit
Router#
```

Configure Routing (1)

- For Router 0: Instructs router that when you receive a packet for 20.0.0.0 network give it to 192.168.0.254.

```
Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 20.0.0.0 255.0.0.0 192.168.0.254
Router(config)#exit
Router#
```

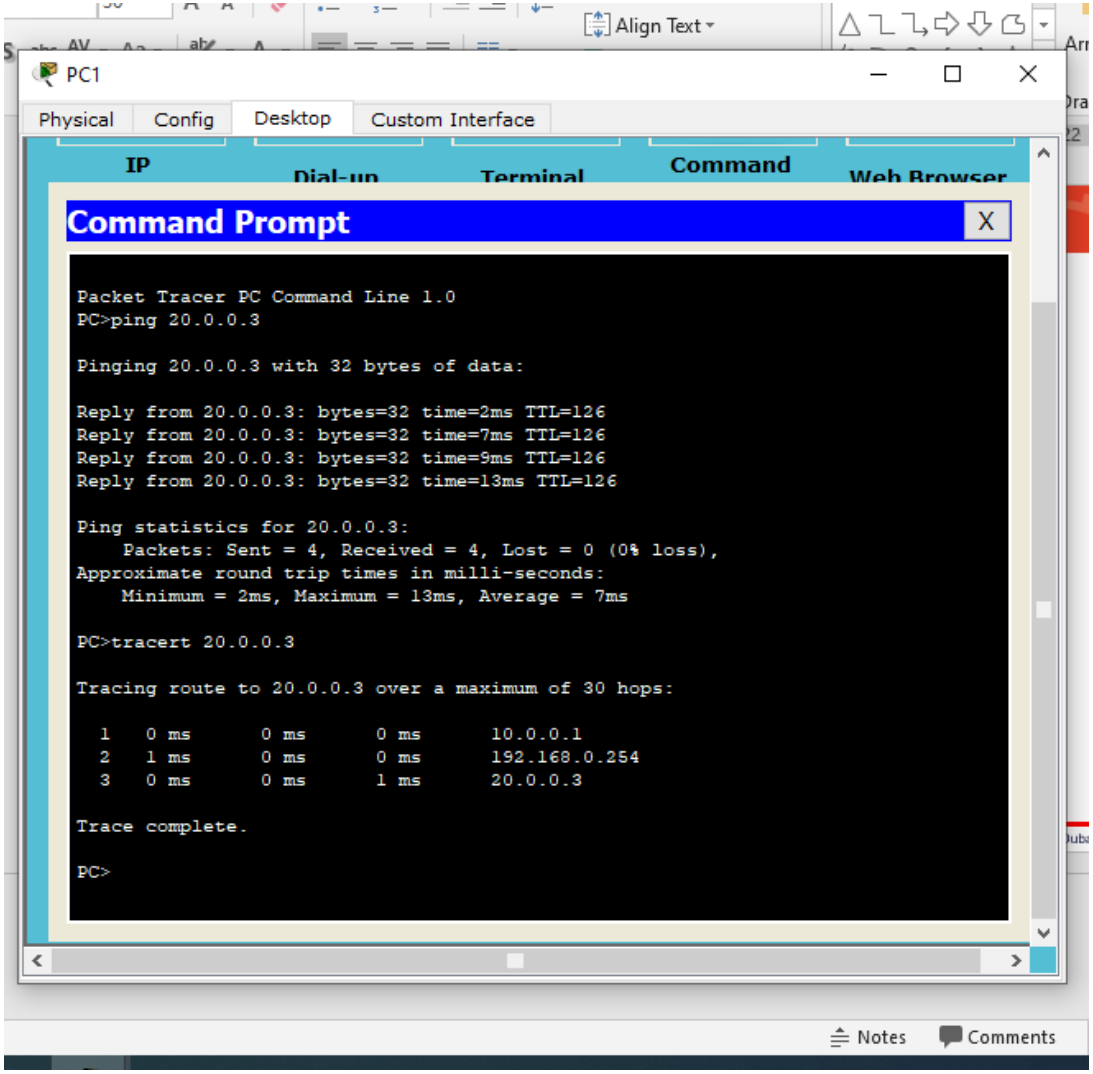
Configure Routing (2)

- For Router 1: Instructs router that when you receive a packet for 10.0.0.0 network give it to 192.168.0.253.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with
    CNTL/Z.
Router(config)#ip route 10.0.0.0 255.0.0.0 192.168.0.253
Router(config)#exit
Router#
```

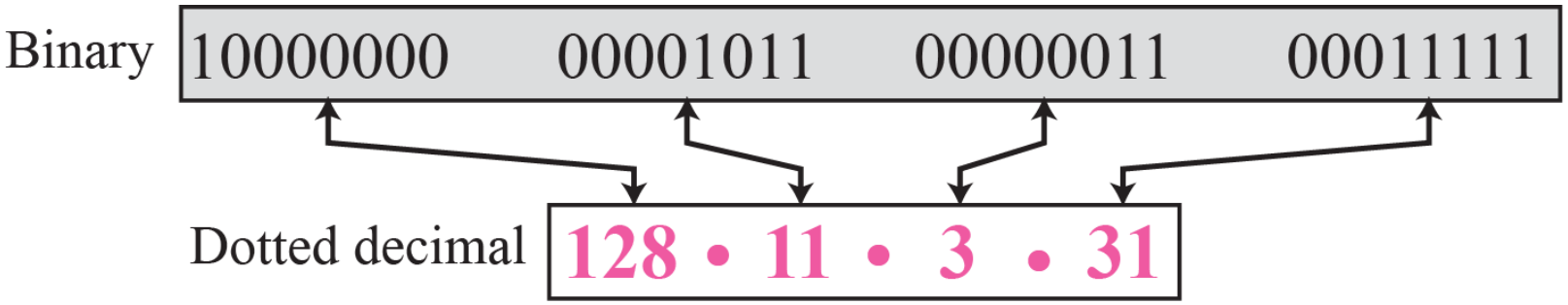
Communication from PC1 to PC3

- Ping and tracert from PC1 to PC3

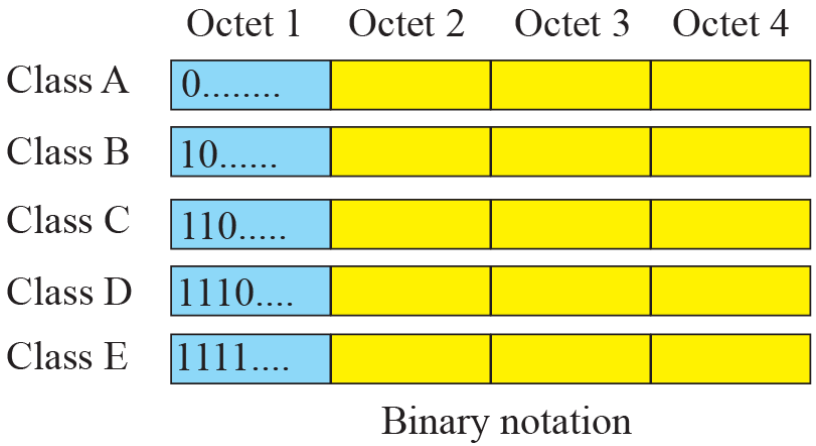


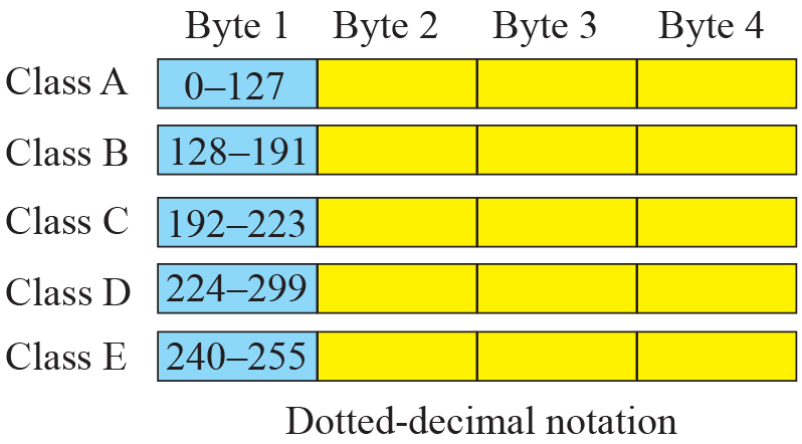
Appendix (1)

- IPv4 Address



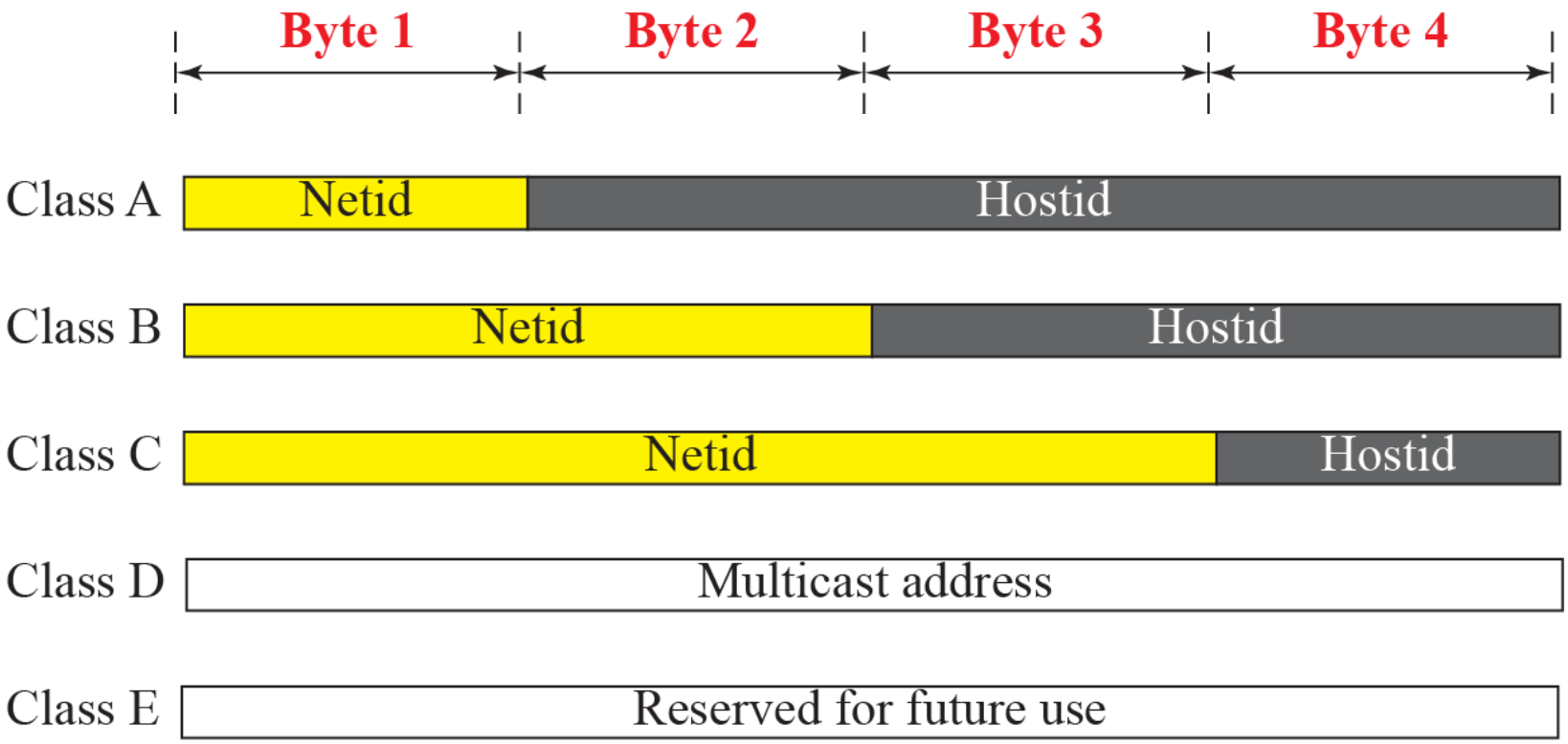
- Classes of IPv4 Address





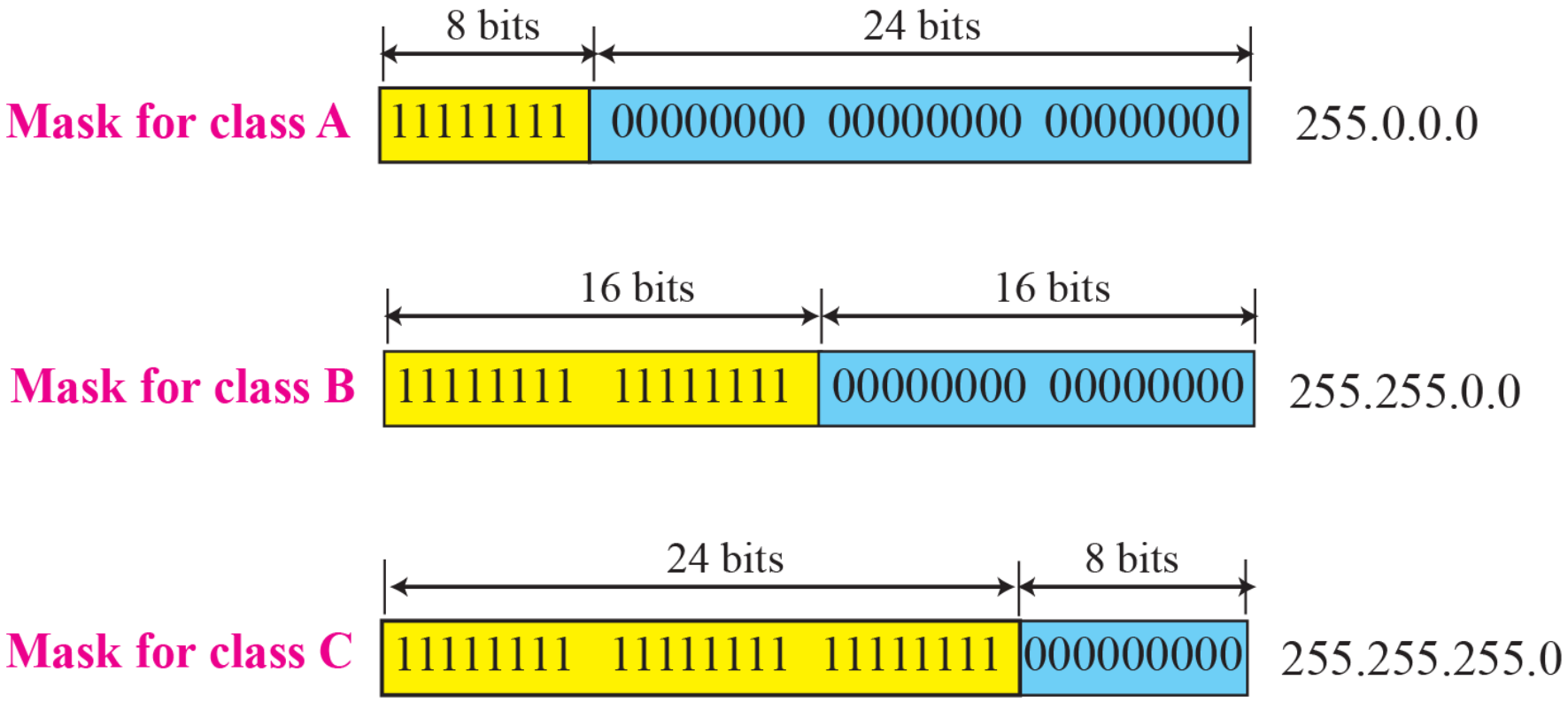
Appendix (2)

- Netid and hostid



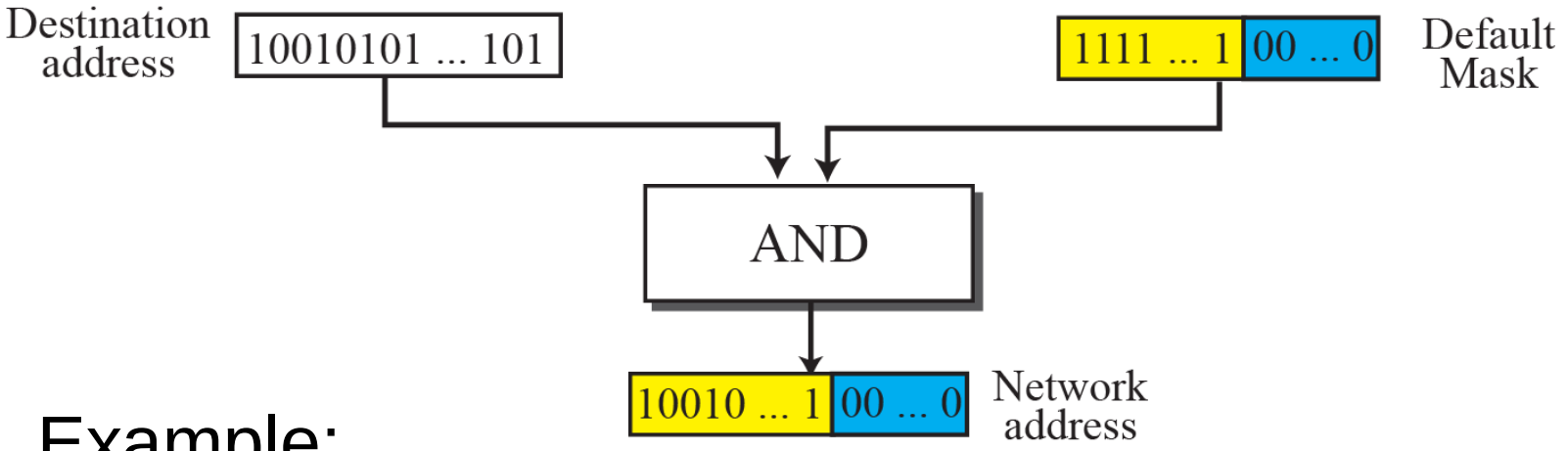
Appendix (3)

- Default Mask



Appendix (4)

- Finding a network address using the default mask



- Example:

A router receives a packet with the destination address 201.24.67.32. Show how the router finds the network address of the packet.

Solution

Since the class of the address is B, we assume that the router applies the default mask for class B, 255.255.0.0 to find the network address.

Destination address	→	201	.	24	.	67	.	32
Default mask	→	255	.	255	.	0	.	0
Network address	→	201	.	24	.	0	.	0

Thank You!