DATA COMMUNICATION AND NETWORKING II

LAB MANUAL:

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FIELD : BSCS – A (6TH SEMESTER)

COURSE : DATA COMMUNICATION & NETWORKING II (512)

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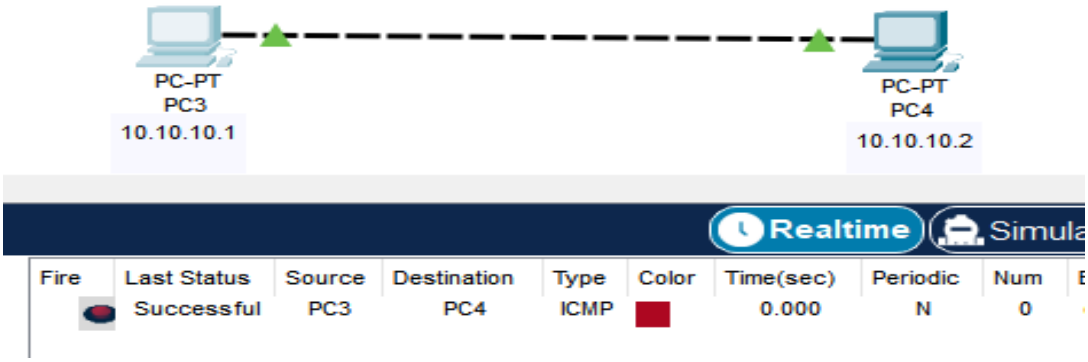
Peer-To-Peer Connection:

CONFIGURATION:

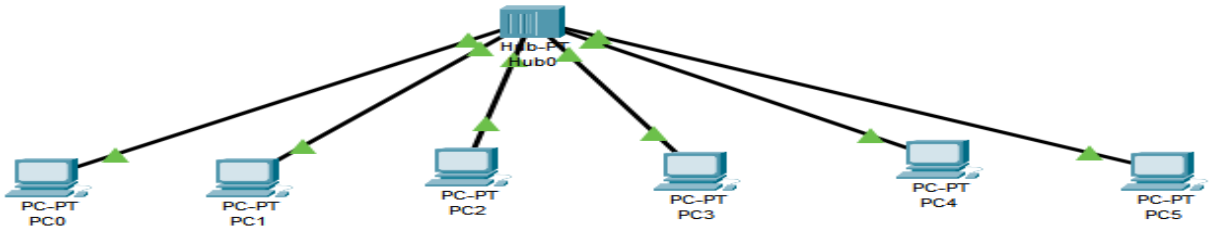
- **Devices:** 2 PCs
- **Connection:** Used crossover Ethernet cable.
- **Configuring IP Address:** Assign each computer a static IP in the same network range.
- **Testing:** Transfer packets to check connectivity

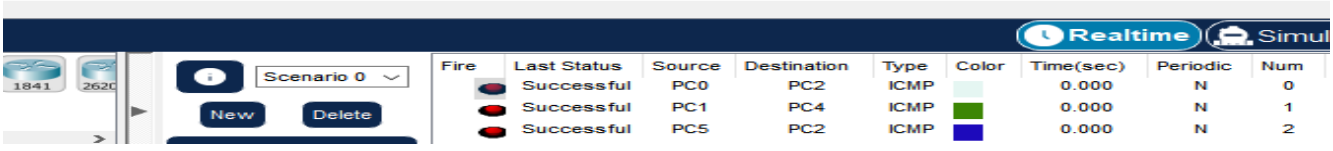


Hub Connection:

CONFIGURATION:

- **Devices:** 6 PCs and 1 Hub.
- **Connection:** Use copper-straight-through cable.
- **Assign IP Addresses:** Set static IPs in the same network range for each device.
- **Testing:** Transfer packets to check connectivity.

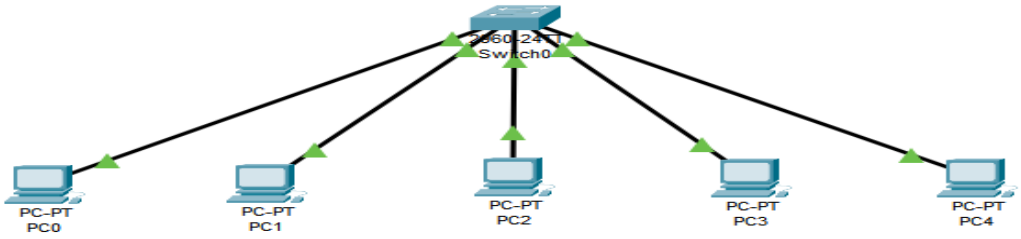


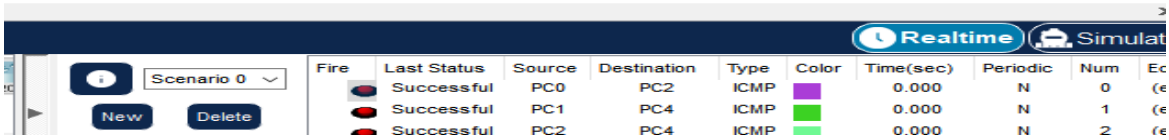


Switch Connection:

CONFIGURATION:

- **Devices:** 5 PCs and 1 Switch.
- **Connection:** Link computers to the switch Copper-straight-through cables.
- **Assign IP Addresses:** Configure static IP addresses.
- **Testing:** Transfer packets to check connectivity

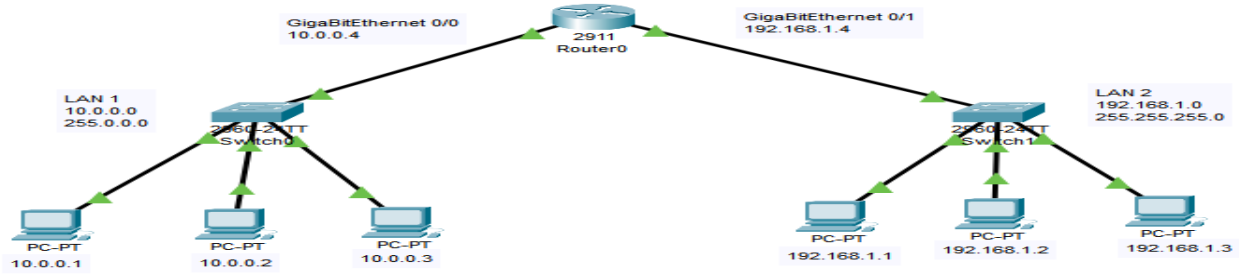


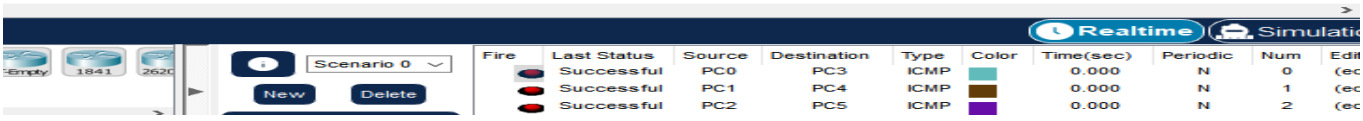


Router Connection:

CONFIGURATION:

- **Devices:** 6 PCs, 2 Switches and 1 Router.
- **Connection:** Connect one end of an Ethernet cable to a device and the other to the router's LAN port.
- **Configure IP Addressing:** Set up the router with an IP address and default gateway address in the same network as connected devices.
- **Testing:** Transfer packets to check connectivity

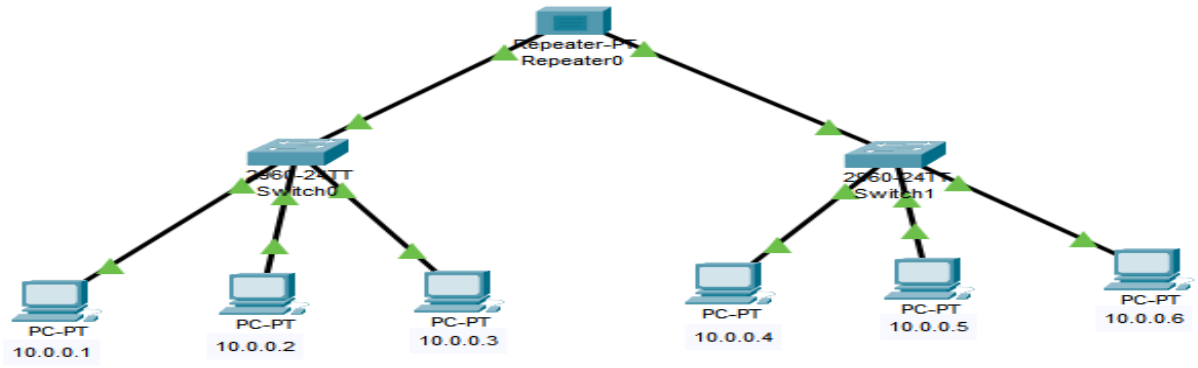


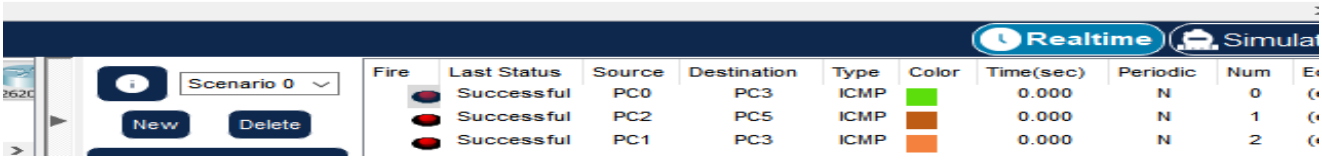


Repeater Connection:

CONFIGURATION:

- **Devices:** 6 PCs, 2 Switches and 1 Repeater.
- **Connection:** Connect devices using copper-straight-through cable.
- **Configure Repeater Settings:** Access the repeater's interface to set the SSID and security details identical to the main network.
- **Testing:** Transfer packets to check connectivity



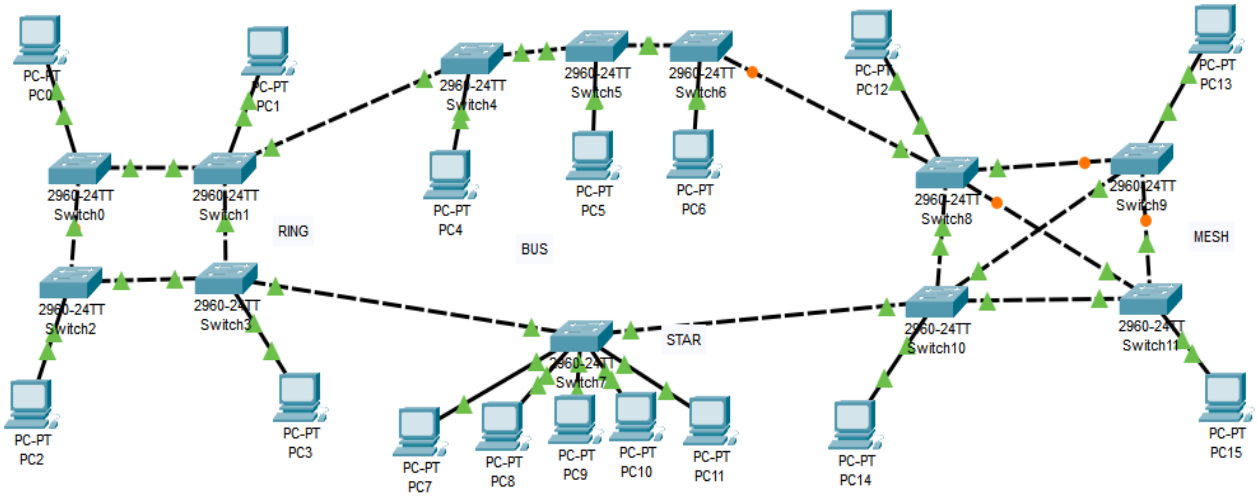


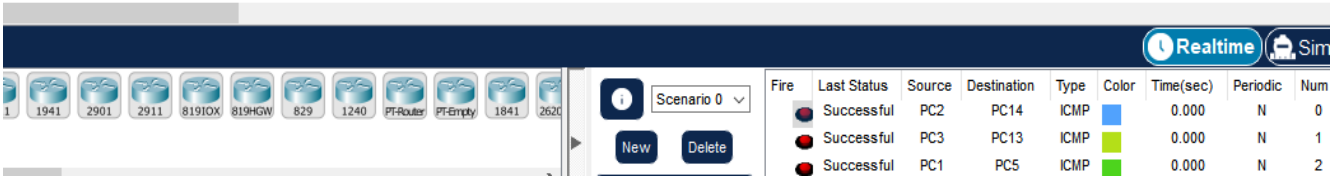
Topologies:

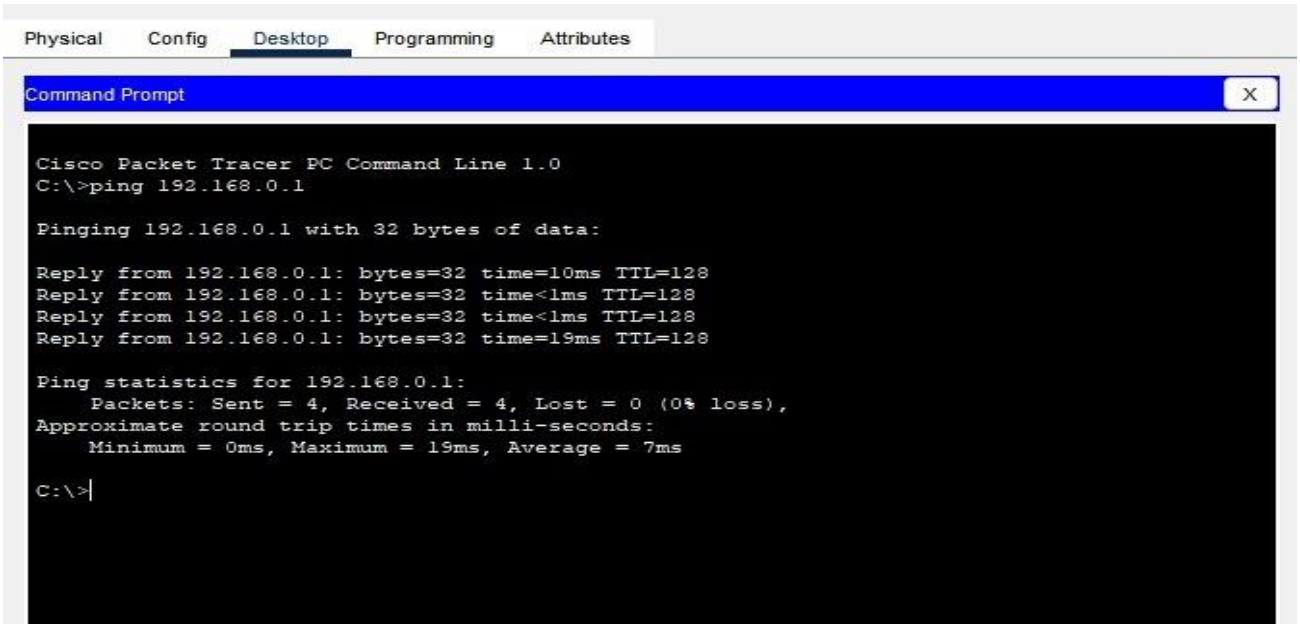
CONFIGURATION:

Topologies:

- **Topology:** Star, Ring, Bus and Mesh topologies.
- **Devices:** 16 PCs and 12 Switches.
- **Connection:** Connect Switches using crossover cable and PCs using cable-straight-through-cable.
- **Ping:** Use ping command to test the connectivity between devices.


PC-PT PC0
PC-PT PC1
2960-24TT Switch4
2960-24TT Switch5
2960-24TT Switch6
PC-PT PC12
PC-PT PC13
2960-24TT Switch0
2960-24TT Switch1
RING
PC-PT PC4
BUS
PC-PT PC5
PC-PT PC6
2960-24TT Switch8
2960-24TT Switch9
MESH
2960-24TT Switch2
2960-24TT Switch3
STAR
2960-24TT Switch10
2960-24TT Switch11
2960-24TT Switch7
PC-PT PC2
PC-PT PC3
PC-PT PC7
PC-PT PC8
PC-PT PC9
PC-PT PC10
PC-PT PC11
PC-PT PC14
PC-PT PC15

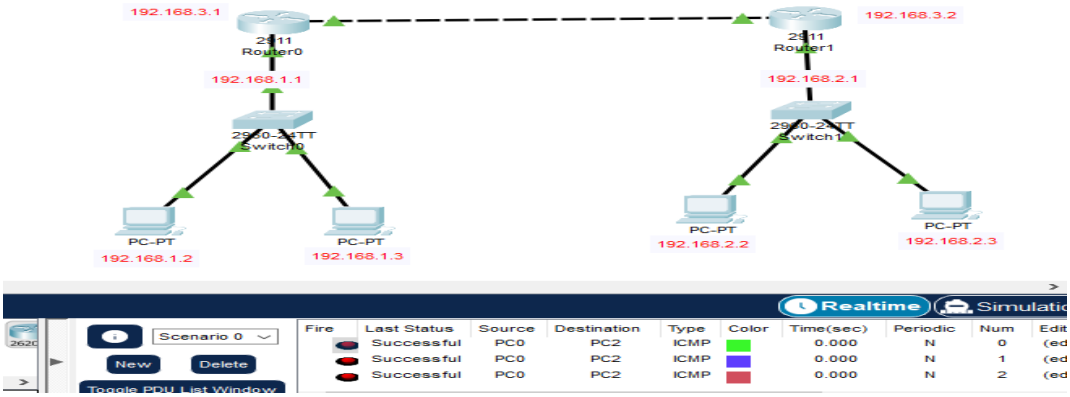

Realtime
Scenario 0
New
Delete
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Successful PC2 PC14 ICMP 0.000 N 0
Successful PC3 PC13 ICMP 0.000 N 1
Successful PC1 PC5 ICMP 0.000 N 2


Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.1
Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time=10ms TTL=128
Reply from 192.168.0.1: bytes=32 time<1ms TTL=128
Reply from 192.168.0.1: bytes=32 time<1ms TTL=128
Reply from 192.168.0.1: bytes=32 time=19ms TTL=128
Ping statistics for 192.168.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 19ms, Average = 7ms
C:\>

Static Routing:

CONFIGURATION:

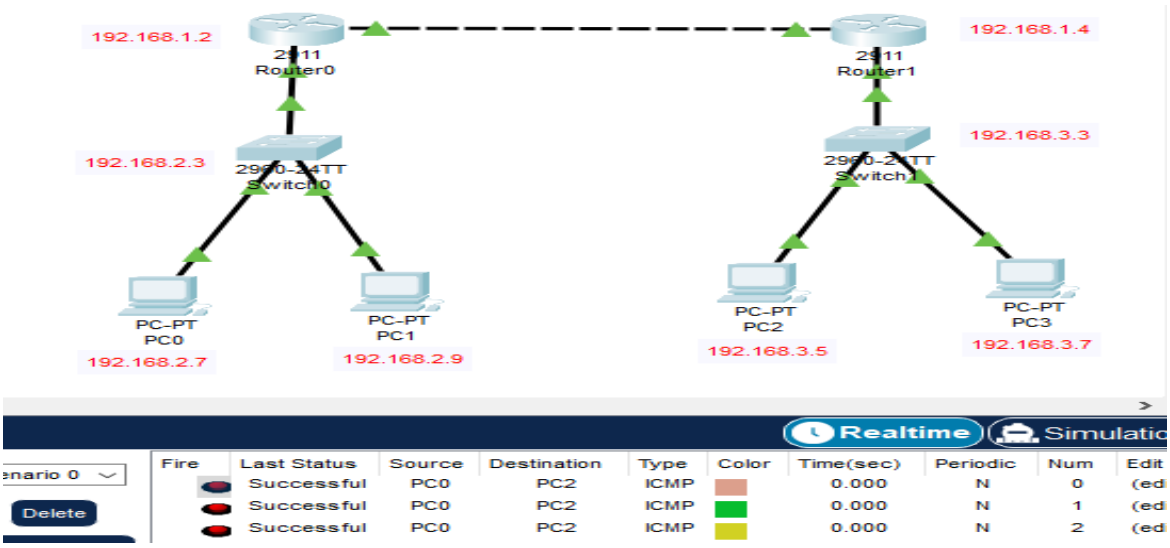
- **Devices:** 4 PCs, 2 Switches and 2 Routers.
- **Connection:** Connect routers with each other using crossover cable and switch to router and PCs to switches using copper-straight-through cable.
- **Assigning IP Address:** Assign each PC IP address and default gateway. Also assign each router IP address.
- **Configuration:** Router config -> Static -> add -> Network, Mask and Next Hop Address.
- **Testing:** Transfer packets to check connectivity.



Static Routing CLI:

CONFIGURATION:

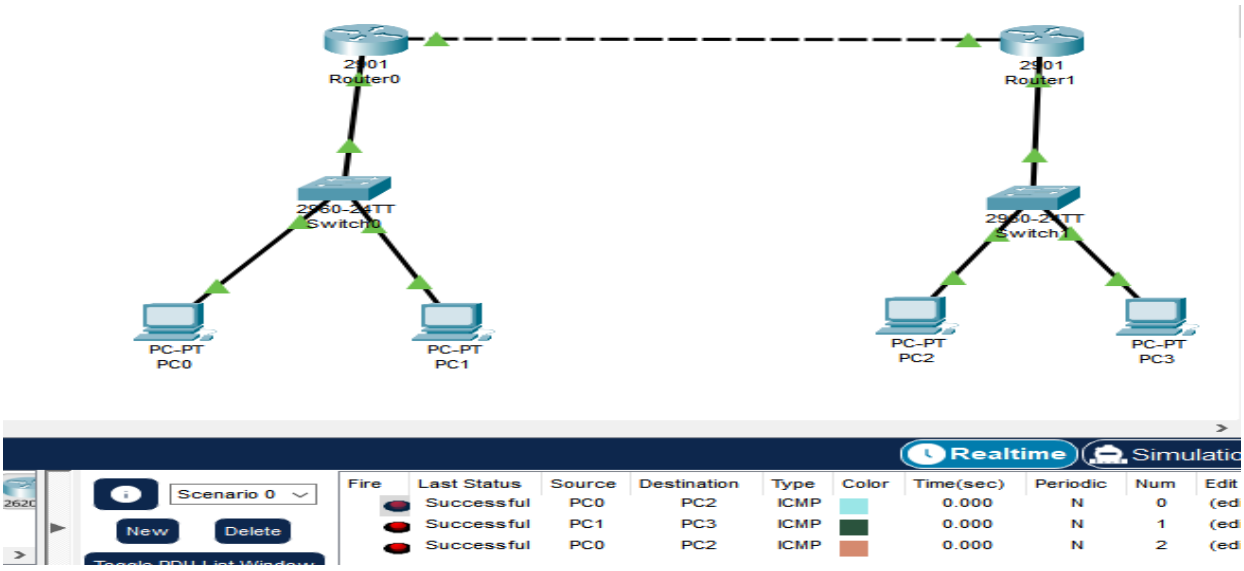
- **Devices:** 4 PCs, 2 Switches and 2 Routers.
- **Connection:** Connect routers with each other using crossover cable and switch to router and PCs to switches using copper-straight-through cable.
- **Assigning IP Address:** Assign each PC IP address and default gateway. Also assign each router IP address.
- **Configuration:** Routers -> CLI -> enable -> conf t -> ip route network_address subnet_mask default_gateway -> exit.
- **Testing:** Transfer packet to check connectivity.



Dynamic Routing RIP:

CONFIGURATION:

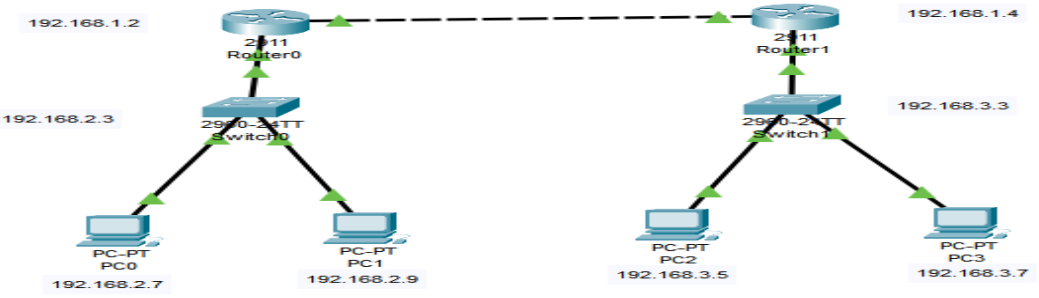
- **Devices:** 4 PCs, 2 Switches and 2 Routers.
- **Connection:** Connect routers with each other using crossover cable and switch to router and PCs to switches using copper-straight-through cable.
- **Assigning IP Address:** Assign each PC IP address and default gateway. Also assign each router IP address.
- **Configuration:** Router -> config -> RIP -> add the networks.
- **Testing:** Transfer packet to check connectivity.



Dynamic Routing CLI:

CONFIGURATION:

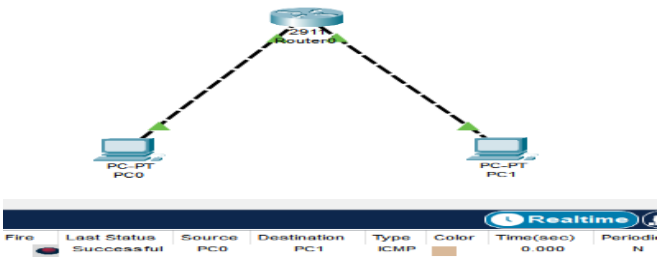
- **Devices:** 4 PCs, 2 Switches and 2 Routers.
- **Connection:** Connect routers with each other using crossover cable and switch to router and PCs to switches using copper-straight-through cable.
- **Assigning IP Address**: Assign each PC IP address and default gateway. Also assign each router IP address.
- **Configuration:** Router -> CLI -> enable -> conf t -> route rip network network_ address network_ address -> version 2 -> exit.
- **Testing:** Transfer packet to check connectivity.



DHCP on Router:

CONFIGURATION:

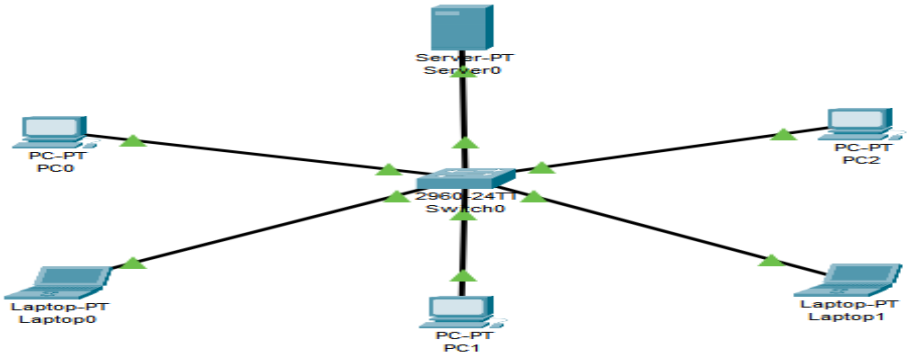
- **Devices:** 2 PCs and 1 Router.
- **Connection:** Connect using crossover cables.
- **Configuration:**
  Router -> CLI -> no -> en -> conf t -> ip dhcp pool lan -> net network_address subnet_mask -> default-router network_address -> exit -> int gig0/0 -> IP address network_address subnet_mask -> no shutdown
- **Testing:** Transfer packet to check connectivity.

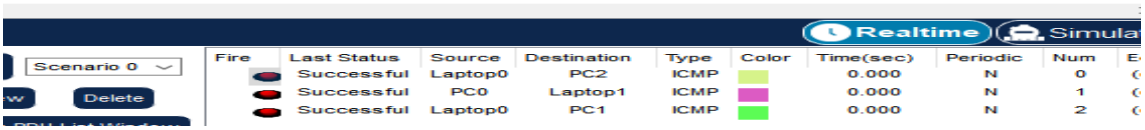


DHCP on Server:

CONFIGURATION:

- **Devices:** 3 PCs, 2 Laptops, 1 Switch and 1 Server.
- **Connection:** Connect devices using copper-straight-through cable.
- **Configuration:** Server -> Desktop -> IP config -> static -> network address, press enter.
  Services -> DHCP -> turn it on and give default gateway and click on save.
- **Testing:** Transfer packet to check connectivity.

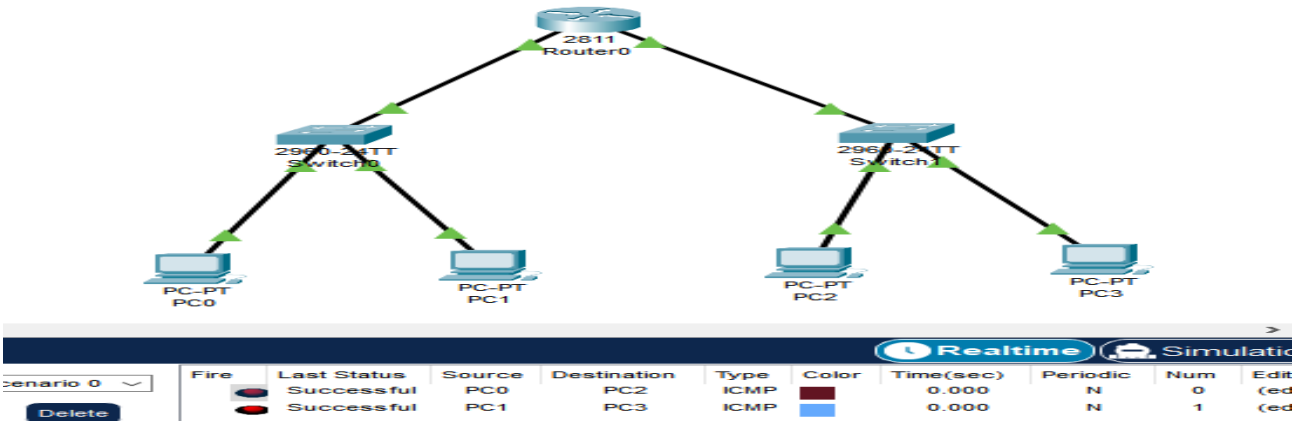




Subnetting:

CONFIGURATION:

- **Devices:** 4 PCs, 2 Switches and 1 Router.
- **Connection:** We have used copper straight-through to connect devices with the switches and the switches to the router.
- **Assigning IP Address**: Assign each PC IP address and default gateway
- **Configuration**:
  Router -> config -> fastEthernet0/0 -> on -> IPv4 address and subnet mask
  Router -> config -> fastEthernet0/1 -> on -> IPv4 address and subnet mask
- **Testing:** Transfer packet to check connectivity.



Setting Password:

CONFIGURATION:

- **Devices:** 2 Switches.
- **Configuration:**
  Switch0 -> en -> conf t -> enable password (Non- Encrypted Password) -> exit -> show running -> config (Not encrypted).
  Switch1 -> en -> conf t -> enable secret (Encrypted Password) -> exit -> show running -> config (Not encrypted).

Smart Home Implementation:

CONFIGURATION:

- **Devices:** 1 Webcam, 1 Motion Detector, 1 Server and 1 Switch.
- **Connection:** Connect devices using copper-straight-through cable.
- **Configuration:**
  <u>Webcam:</u>
  config -> fastEthernet0 -> static -> IP address

  setting -> remote server -> server_address, user, password and click on config.

Motion Detector:

config-> fastEthernet0 -> static -> IP address

config -> setting -> remote server -> server_address, user, password and click on config.

Server:

IoT -> turn on

config -> fastEthernet0 -> IP address

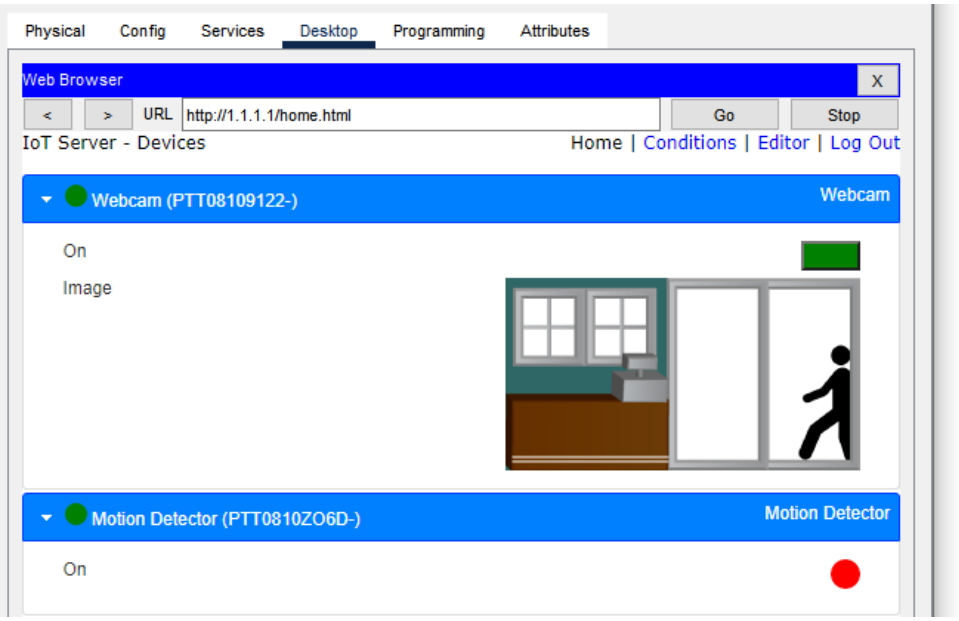
Desktop-> give url, user and password.

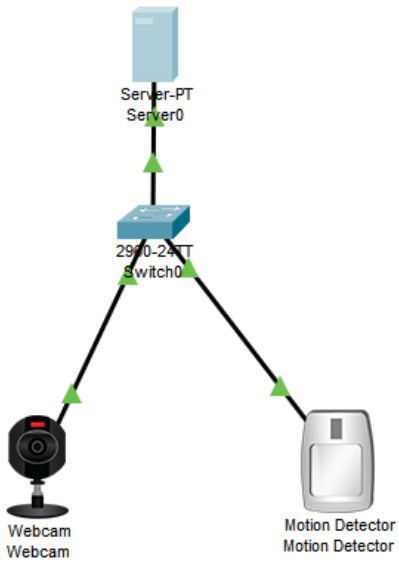
Server:

Desktop -> https -> give url, user, password

Condition -> add -> webcam and motion detector

- **Testing:** server -> desktop -> http request -> user, password -> camera will be on.





RIPv2:

CONFIGURATION:

- **Devices:** 9 PCs, 3 Switches and 3 Routers.
- **Connection:** We have used copper straight-through to connect devices with routers.
- **Assigning IP Address**: Assign each PC IP address and default gateway
- **Configuration:**

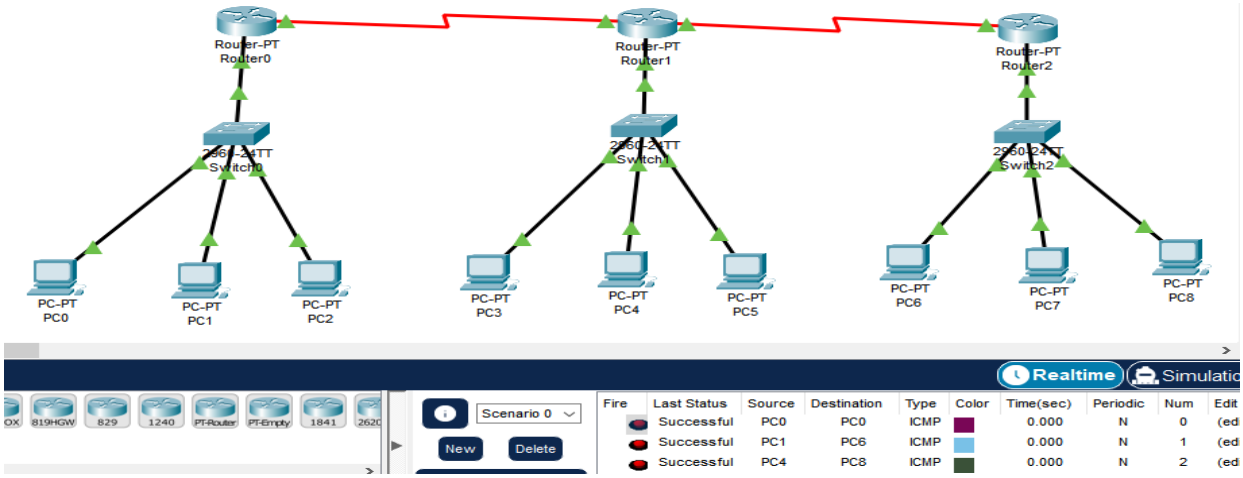
  Router -> config -> fastEthernet0/0 -> IPv4 address and turn it on

  config -> serial2/0 -> turn it on and assign IPv4 address

  For RIP:

  Router -> cli -> router rip -> version 2

  Router -> config -> network -> add
- **Testing:** Transfer packet to check connectivity.



Configuring RIPv2:

CONFIGURATION:

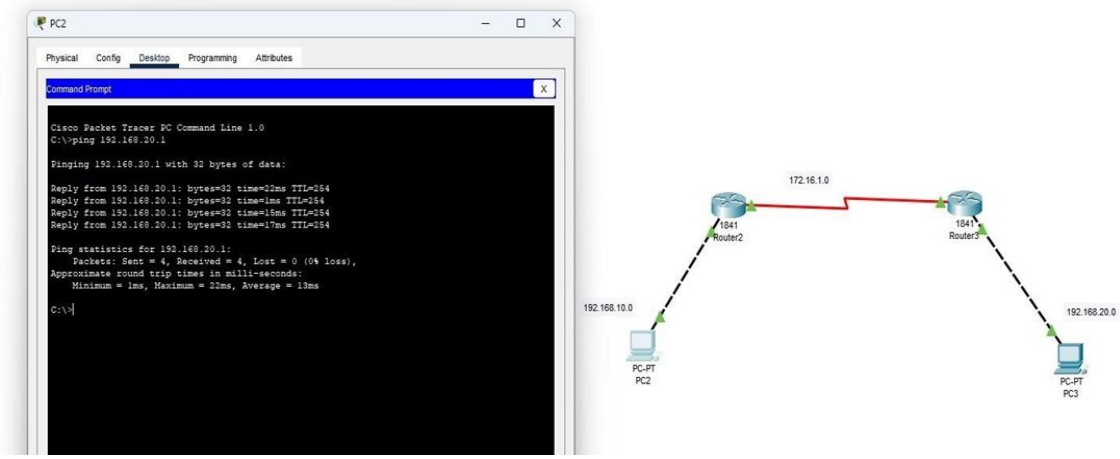
- **Devices:** 2 PCs and 2 Routers.
- **Connection:** We have used copper straight-through to connect devices with routers.
- **Assigning IP Address**: Assign each PC IP address and default gateway
- **Configuration:**

  Router-> CLI -> en -> config t -> int Gig0/0 -> ip add network_address subnet_mask -> no shutdown -> exit -> int Gig0/1 -> ip add network_address subnet_mask -> no shutdown -> exit

  To resolve packet transfer issue:

  Router0 -> CLI -> int Gig0/1 -> clock rate 64000 -> exit

  Router –> cli -> router rip -> version 2 -> network address -> network address -> exit
- **Testing:** Transfer packet to check connectivity.



OSPF in CPT:

CONFIGURATION:

- **Devices:** 9 PCs, 3 Switches and 3 Routers.
- **Connection:** We have used copper straight-through to connect devices with the switches and then the switches to the routers.
- **Assigning IP Address**: Assign each PC IP address and default gateway
- **Configuration:**

  Router -> config -> fastEthernet0/0 -> IP address and turn it on
  config -> serial2/0 -> turn it on and assign IP address

  <u>Configuration for OSPF:</u>

  Router -> CLI -> router ospf 1 -> network IP_address wild_card_mask area 0 -> network IP_address wild_card_mask area 0 -> network IP_address wild_card_mask area 0 -> network IP_address wild_card_mask area 0 -> network IP_address wild_card_mask area 0 -> exit
- **Testing:** Transfer packet to check connectivity.