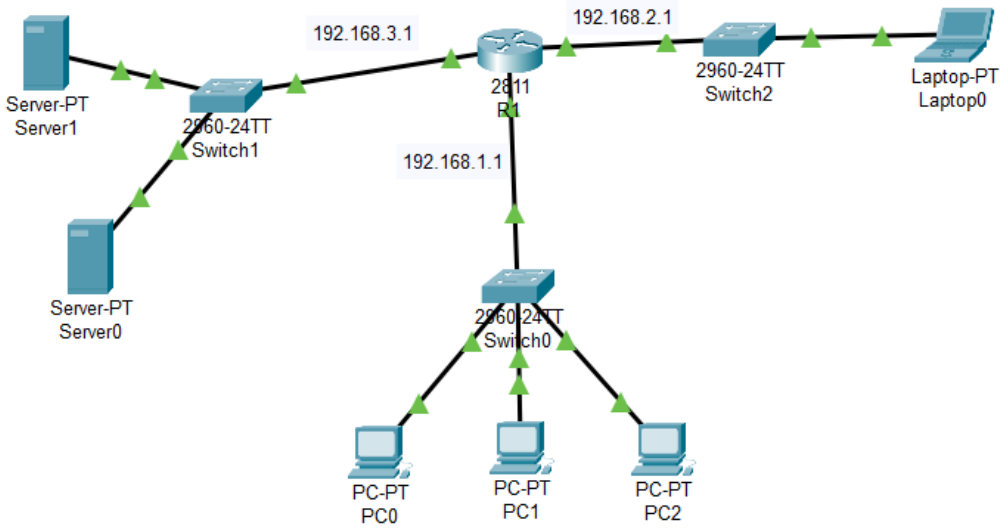
DHCP Topology:



Commands:

LAN Configuration:

R1>CLI>

- en
- conf t
- Interface gigaEthernet 0/0
- ip address 192.168.1.1 255.255.255.0
- no shut
- exit
- Interface gigaEthernet 0/1
- ip address 192.168.2.1 255.255.255.0
- no shut
- Interface gigaEthernet 0/2
- ip address 192.168.3.1 255.255.255.0
- no shut

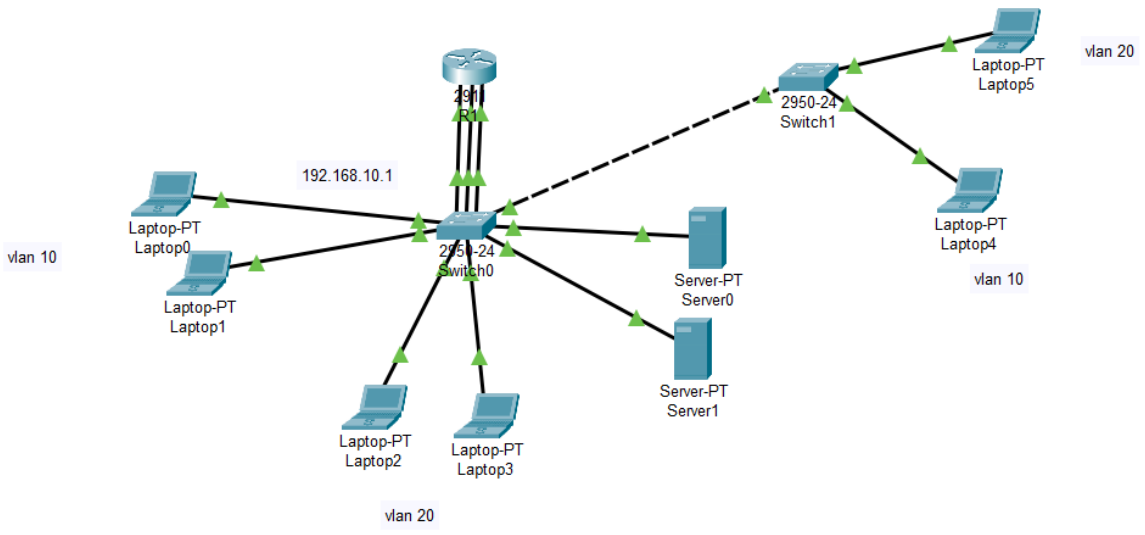
- ➔ ip dhcp pool dhcp_server1
- ➔ network 192.168.1.0 255.255.255.0
- ➔ default-router 192.168.1.1
- ➔ dns-server 192.168.3.5

- ➔ ip dhcp pool dhcp_server2
- ➔ network 192.168.2.0 255.255.255.0
- ➔ default-router 192.168.2.1
- ➔ dns-server 192.168.3.5
- ➔ exit

Configure DNS server:
DNS server -> Services -> DNS -> on

Web Server Configuration:
Web server -> Services -> http -> on

VLAN Topology:



VLAN 10 = faculties = 192.168.10.0/24
G.W: 192.168.10.1

VLAN 20 = students = 192.168.20.0/24
G.W: 192.168.20.1

VLAN30 = server = 192.168.30.0/24
G.W: 192.168.30.1

Switch0> CLI>
Commands:

- ➔ vlan 10
- ➔ name faculties
- ➔ vlan 20
- ➔ name students
- ➔ vlan 30
- ➔ name servers

- ➔ Interface fastEthernet 0/1
- ➔ switchport mode access
- ➔ Interface range fastEthernet 0/4-5
- ➔ switchport access vlan 10

- ➔ Interface fastEthernet 0/2
- ➔ switchport mode access
- ➔ Interface range fastEthernet 0/6-7
- ➔ switchport access vlan 20

- ➔ Interface fastEthernet 0/3
- ➔ switchport mode access
- ➔ Interface range fastEthernet 0/8-9
- ➔ switchport access vlan 30

Trunking:

Switch1>CLI>

- ➔ Interface fastEthernet 0/10
- ➔ switchport mode trunk
- ➔ switchport trunk allowed vlan 10,20

Switch2>CLI>

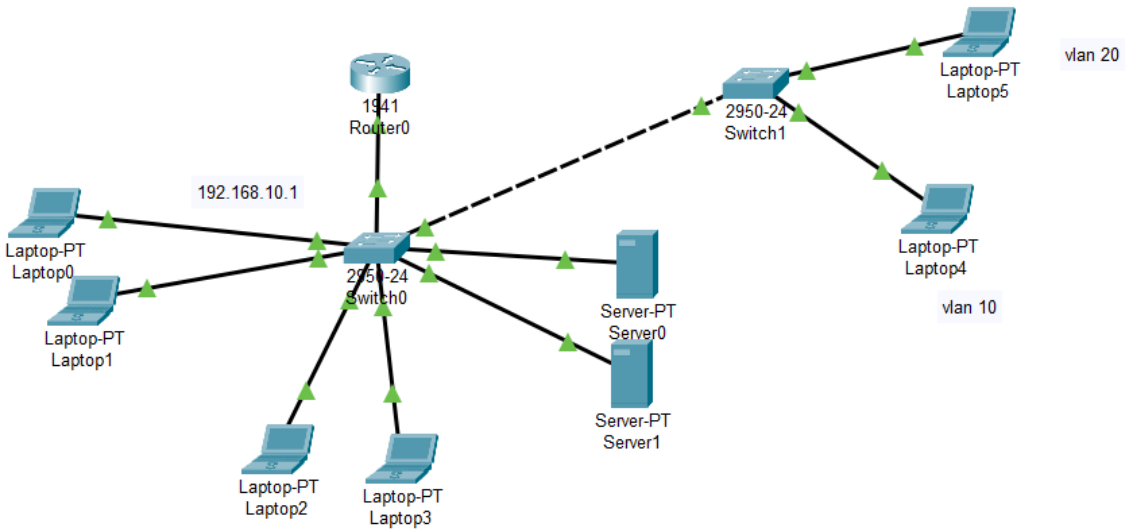
- ➔ Interface fastEthernet 0/1
- ➔ switchport mode trunk
- ➔ switchport trunk allowed vlan 10,20

- ➔ vlan 10
- ➔ name students
- ➔ vlan 20
- ➔ name faculties

- ➔ Interface fastEthernet 0/2
- ➔ switchport mode access
- ➔ Interface range fastEthernet 0/2
- ➔ switchport access vlan 10

- ➔ Interface fastEthernet 0/3
- ➔ switchport mode access
- ➔ Interface range fastEthernet 0/3
- ➔ switchport access vlan 20

Inter VLAN:



SwithcO>CLI>

- ➔ Interface fastEthernet 0/1
- ➔ switchport mode trunk
- ➔ switchport trunk allowed vlan 10,20

RouterO>CLI>

- ➔ Interface gigaEthernet 0/0
- ➔ no shut
- ➔ exit
- ➔ Interface gigaEthernet 0/0.10
- ➔ exit
- ➔ Interface gigaEthernet 0/0.20
- ➔ exit
- ➔ Interface gigaEthernet 0/0.30
- ➔ exit

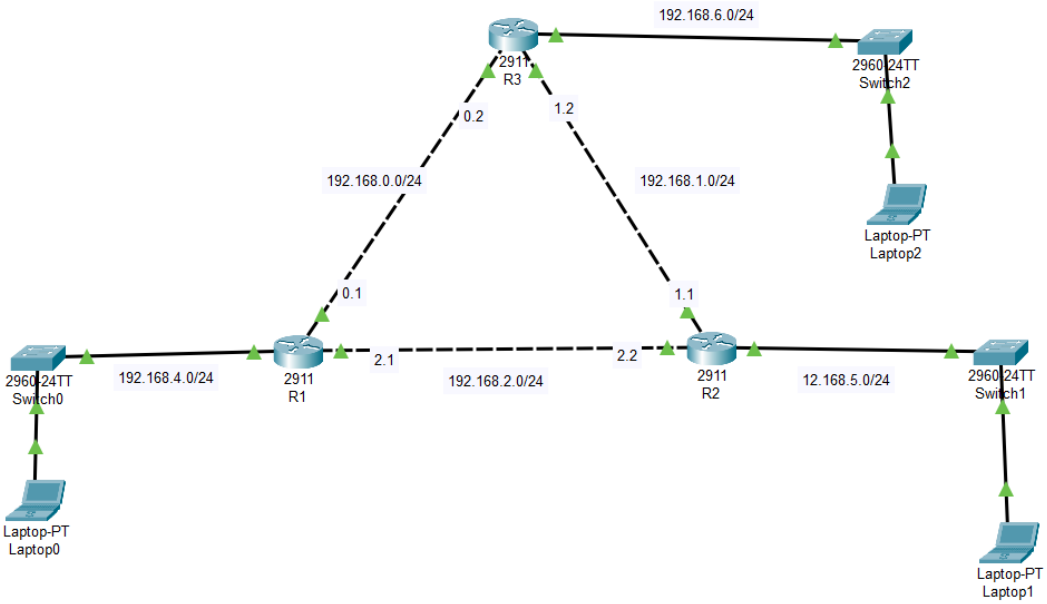
- ➔ Interface gigaEthernet 0/0.10
- ➔ encapsulation dot1Q 10

- ip address 192.168.10.1 255.255.255.0
- exit

- Interface gigaEthernet 0/0.20
- encapsulation dot1Q 20
- ip address 192.168.20.1 255.255.255.0
- exit

- Interface gigaEthernet 0/0.30
- encapsulation dot1Q 30
- ip address 192.168.30.1 255.255.255.0
- exit

RIP Routing:



R1>CLI>

Commands:

LAN Configuration:

- ➔ Interface gigaEthernet 0/0
- ➔ ip address 192.168.2.1 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/1
- ➔ ip address 192.168.0.1 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/2
- ➔ ip address 12.168.4.1 255.255.255.0
- ➔ no shut
- ➔ exit

R2>CLI>

- ➔ Interface gigaEthernet 0/0
- ➔ ip address 192.168.2.2 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/1
- ➔ ip address 192.168.1.1 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/2
- ➔ ip address 12.168.5.1 255.255.255.0

- ➔ no shut
- ➔ exit

R3>CLI>

- ➔ Interface gigaEthernet 0/0
- ➔ ip address 192.168.0.2 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/1
- ➔ ip address 192.168.1.2 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/2
- ➔ ip address 12.168.6.1 255.255.255.0
- ➔ no shut
- ➔ exit

R1>CLI>

- ➔ router rip
- ➔ version 2
- ➔ network 192.168.0.0
- ➔ network 192.168.2.0
- ➔ network 192.168.4.0

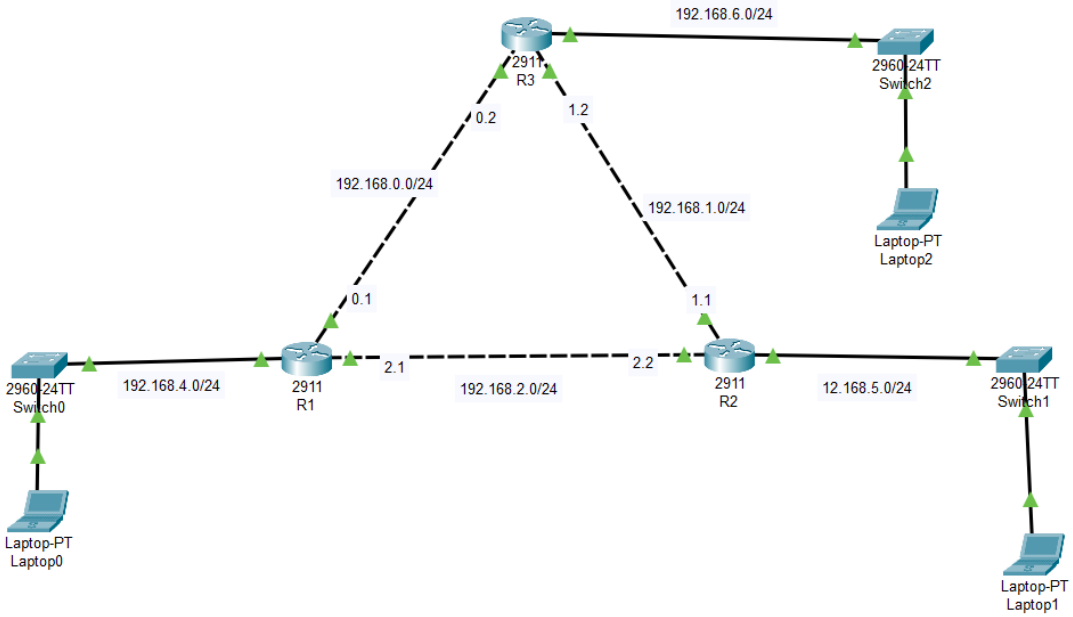
R2>CLI

- ➔ router rip
- ➔ version 2
- ➔ network 192.168.1.0
- ➔ network 192.168.2.0
- ➔ network 192.168.5.0

R3>CLI>

- ➔ router rip
- ➔ version 2
- ➔ network 192.168.0.0
- ➔ network 192.168.1.0
- ➔ network 192.168.6.0

OSPF Routing:



R1>CLI>

Commands:

- ➔ router ospf 1
- ➔ network 192.168.4.0 0.0.0.255 area 0
- ➔ network 192.168.2.0 0.0.0.255 area 0
- ➔ network 192.168.0.0 0.0.0.255 area 0

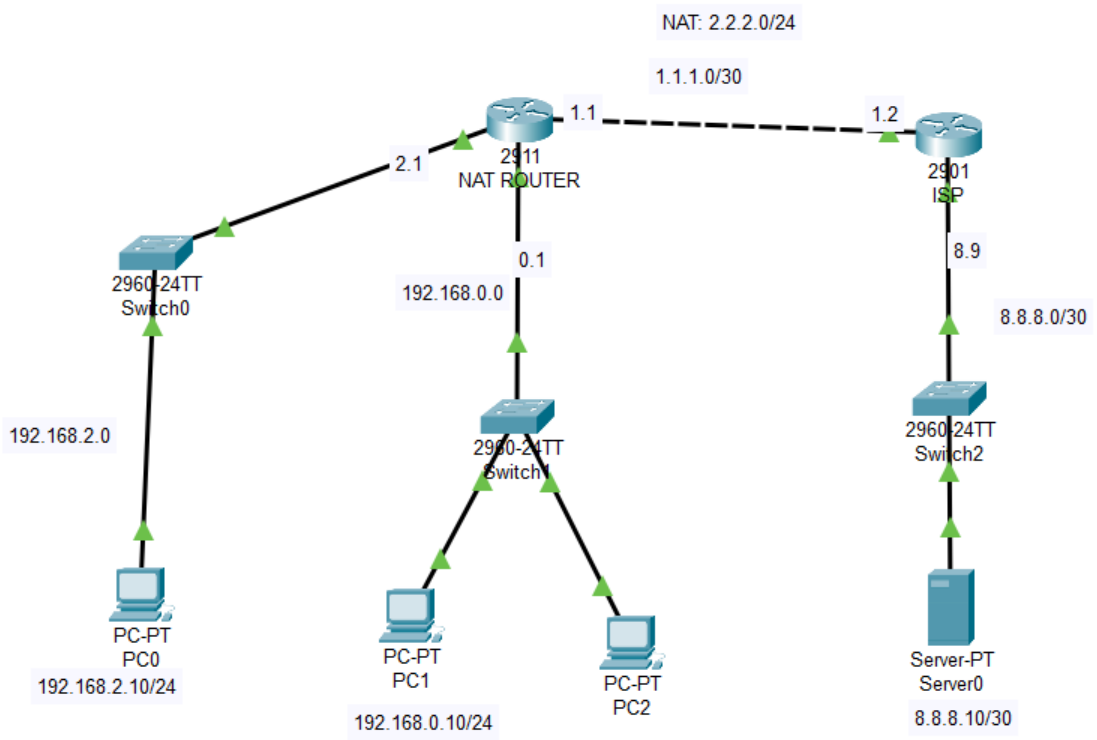
R2>CLI>

- ➔ router ospf 2
- ➔ network 192.168.1.0 0.0.0.255 area 0
- ➔ network 192.168.2.0 0.0.0.255 area 0
- ➔ network 192.168.5.0 0.0.0.255 area 0

R3>CLI>

- ➔ router ospf 3
- ➔ network 192.168.0.0 0.0.0.255 area 0
- ➔ network 192.168.1.0 0.0.0.255 area 0
- ➔ network 192.168.6.0 0.0.0.255 area 0

NAT/PAT:



Lan Configuration:

NAT ROUTER>

- ➔ Interface gigaEthernet 0/0
- ➔ ip address 192.168.2.1 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/1
- ➔ ip address 192.168.0.0 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/2
- ➔ ip address 1.1.1.1 255.255.255.0
- ➔ no shut
- ➔ exit

ISP

- ➔ Interface gigaEthernet 0/0
- ➔ ip address 192.168.1.2 255.255.255.0
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/1
- ➔ ip address 8.8.8.1 255.255.255.0
- ➔ no shut
- ➔ exit

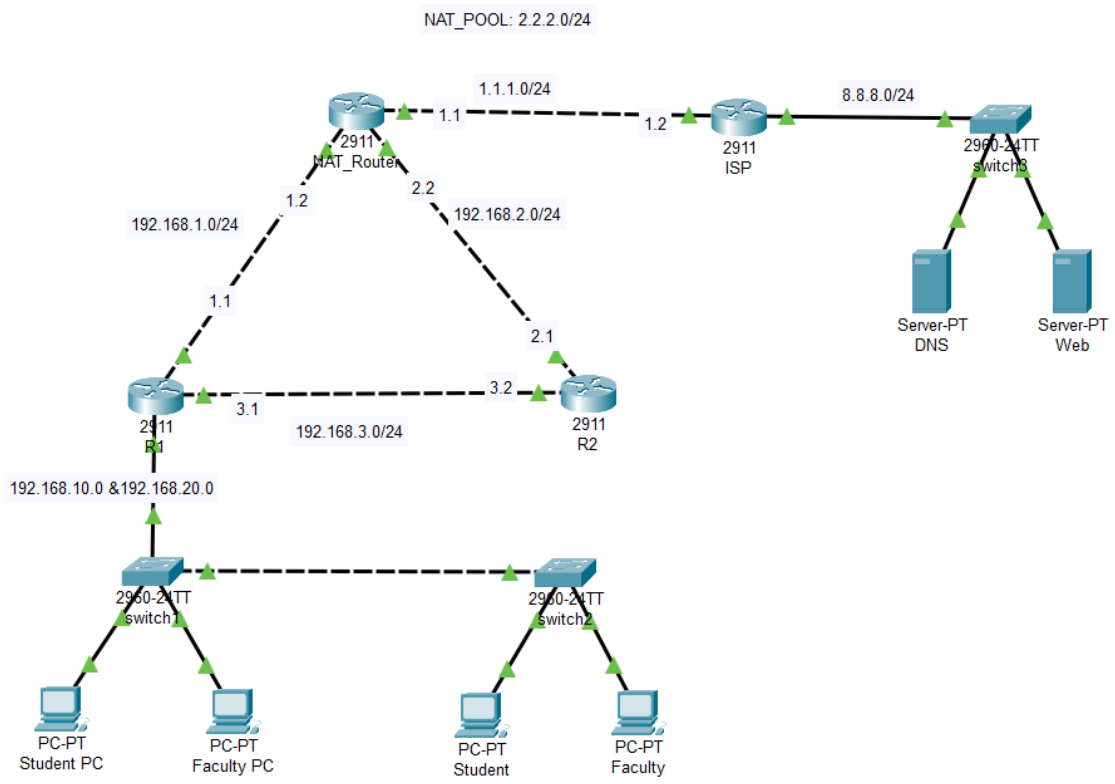
- ➔ ip route 2.2.2.0 255.255.255.0 1.1.1.1

NAT ROUTER>CLI>

- ➔ ip route 0.0.0.0 0.0.0.0 1.1.1.2
- ➔ access-list 1 permit 192.168.0.0 0.0.0.255
- ➔ ip nat pool NAT_POOL 2.2.2.1 2.2.2.2 netmask 255.255.255.0
- ➔ ip nat inside source list 1 pool NAT_POOL overload

- ➔ Interface gigaEthernet 0/0
- ➔ ip nat inside
- ➔ Interface gigaEthernet 0/1
- ➔ ip nat outside

FINAL ASSIGNMENT:



Configure VLAN:

Switch1>CLI:

- ➔ en
- ➔ conf t
- ➔ vlan 10
- ➔ name student
- ➔ vlan 20
- ➔ name faculty
- ➔ exit

- ➔ Interface range fastEthernet 0/2-3
- ➔ switchport access vlan 10
- ➔ Interface range fastEthernet 0/4-5
- ➔ switchport access vlan 20
- ➔ exit

Trunking:

Switch1>CLI>

- ➔ Interface fastEthernet 0/1
- ➔ switchport mode trunk
- ➔ switchport trunk allowed vlan 10,20

- ➔ Interface fastEthernet 0/10
- ➔ switchport mode trunk
- ➔ switchport trunk allowed vlan 10,20

Switch2>CLI:

- ➔ en
- ➔ conf t
- ➔ Interface fastEthernet 0/1
- ➔ switchport mode trunk
- ➔ switchport trunk allowed vlan 10,20
- ➔ exit

- ➔ vlan 10
- ➔ name student
- ➔ vlan 20
- ➔ name faculty

- ➔ Interface fastEthernet 0/2
- ➔ switchport access vlan 10
- ➔ Interface fastEthernet 0/3
- ➔ switchport access vlan 20

Inter-VLAN Configuration:

R1>CLI:

- ➔ en
- ➔ conf t
- ➔ Interface gigaEthernet 0/2
- ➔ no shut
- ➔ exit

- ➔ Interface gigaEthernet 0/2.10
- ➔ exit
- ➔ Interface gigaEthernet 0/2.20
- ➔ exit

- ➔ Interface gigaEthernet 0/2.10
- ➔ encapsulation dot1Q 10
- ➔ ip address 192.168.10.1 255.255.255.0
- ➔ exit

- ➔ Interface gigaEthernet 0/2.20
- ➔ encapsulation dot1Q 20
- ➔ ip address 192.168.20.1 255.255.255.0
- ➔ exit

DHCP Configuration:

R1>CLI:

- ip dhcp pool student
- network 192.168.10.0 255.255.255.0
- default-router 192.168.10.1
- dns-server 8.8.8.10
- exit

- ip dhcp pool faculty
- network 192.168.20.0 255.255.255.0
- default-router 192.168.20.1
- dns-server 8.8.8.10
- exit

RIP Configuration:

R1>CLI:

- en
- conf t
- router rip
- version 2
- network 192.168.1.0
- network 192.168.3.0
- network 192.168.10.0
- network 192.168.20.0

- ip route 0.0.0.0 0.0.0.0 192.168.1.2
- ip route 0.0.0.0 0.0.0.0 192.168.2.2

R2>CLI:

- router rip
- version 2
- network 192.168.2.0

- ➔ network 192.168.3.0
- ➔ ip route 0.0.0.0 0.0.0.0 92.168.2.2

NAT ROUTER>CLI:

- ➔ router rip
- ➔ version 2
- ➔ network 192.168.1.0
- ➔ network 192.168.2.0

NAT/PAT Configuration:

ISP>CLI:

- ➔ ip route 2.2.2.0 255.255.255.0 1.1.1.1

NAT ROUTER>CLI:

- ➔ ip route 0.0.0.0 0.0.0.0 1.1.1.2
- ➔ access-list 1 permit 192.168.1.0 0.0.0.255
- ➔ ip nat pool NAT_POOL 2.2.2.1 2.2.2.2 netmask 255.255.255.0
- ➔ ip nat inside source list 1 pool NAT_POOL overload

- ➔ Interface gigabitEthernet 0/0
- ➔ ip nat inside
- ➔ Interface gigabitEthernet 0/1
- ➔ ip nat inside
- ➔ Interface gigabitEthernet 0/2
- ➔ ip nat outside

- ➔ access-list 1 permit 192.168.2.0 0.0.0.255
- ➔ access-list 1 permit 192.168.10.0 0.0.0.255
- ➔ access-list 1 permit 192.168.20.0 0.0.0.255

DNS Server Configuration:

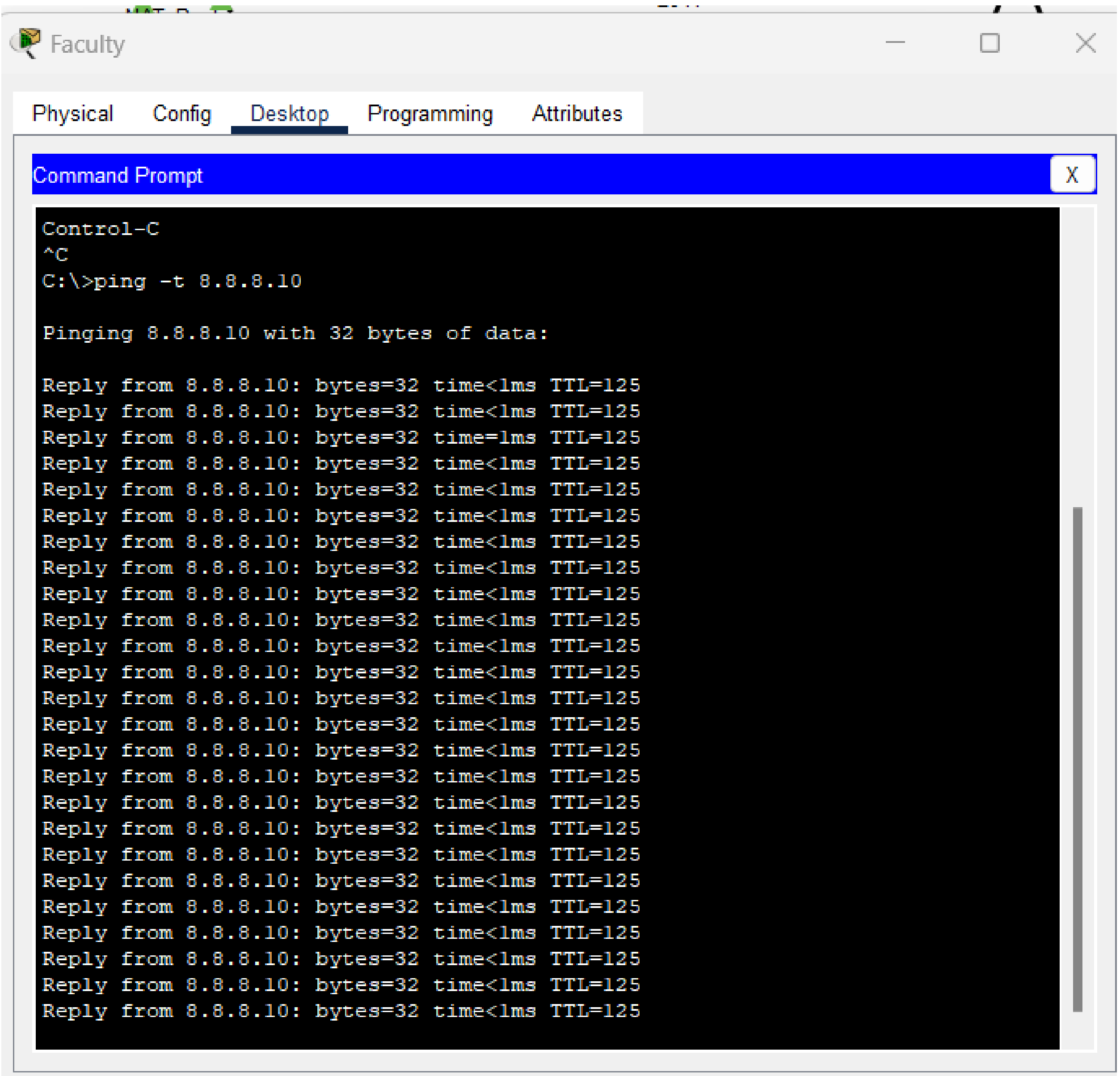
DNS server -> Services -> DNS -> on

Web Server Configuration:

Web Server -> Services -> Http -> on

OUTPUT/TESTING:

Ping testing:



DNS/Web Server testing: