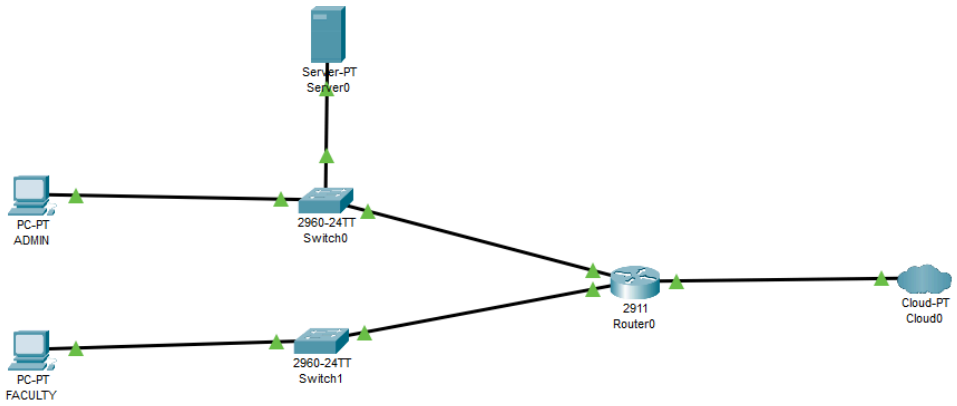



## Part 1 – DHCP Configuration

## 1. Configure DHCP service on the router for both LANs.

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip dhcp excluded-address 192.168.10.1 192.168.10.9
Router(config)#ip dhcp excluded-address 192.168.20.1 192.168.20.9
```

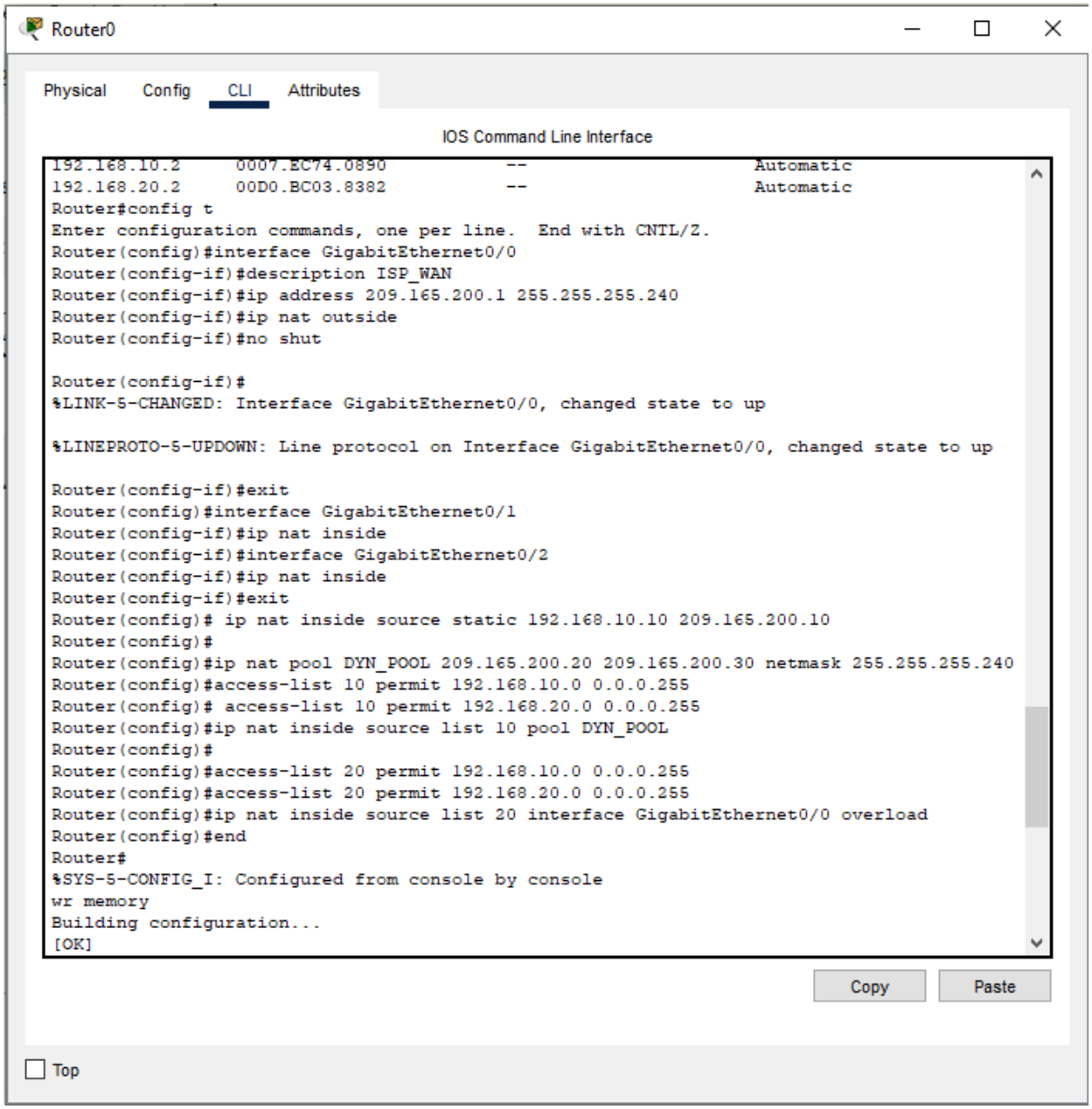
## 2. Make sure gateway addresses are not included in the pool.

```
Router(config)#ip dhcp pool ADMIN
Router(dhcp-config)#network 192.168.10.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.10.1
Router(dhcp-config)#dns-server 8.8.8.8
Router(dhcp-config)# domain-name admin.local

Router(config)#ip dhcp pool FACULTY
Router(dhcp-config)#network 192.168.20.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.20.1
Router(dhcp-config)#dns-server 8.8.8.8
Router(dhcp-config)#domain-name faculty.local

Router(config)#interface GigabitEthernet0/1
Router(config-if)#description Admin_LAN
Router(config-if)#ip address 192.168.10.1 255.255.255.0
Router(config-if)#no shut


Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#description Faculty_LAN
Router(config-if)#ip address 192.168.20.1 255.255.255.0
Router(config-if)#no shut
```

## 3. Verify that Admin-PC and Faculty-PC automatically receive IPs.

```
Router>show ip dhcp binding
IP address       Client-ID/              Lease expiration        Type
                 Hardware address
192.168.10.11    0007.EC74.0890           --                     Automatic
192.168.20.10    00D0.BC03.8382           --                     Automatic
```

## Part 2 – NAT Configuration




### 1. Configure Static NAT for the web server.

```
Router(config)# ip nat inside source static 192.168.10.10 209.165.
```

### 2. Configure Dynamic NAT with the given IP pool.

```
Router(config)#ip nat pool DYN_POOL 209.165.200.20 209.165.200.30 netmask 255.255.255.240
Router(config)#access-list 10 permit 192.168.10.0 0.0.0.255
Router(config)# access-list 10 permit 192.168.20.0 0.0.0.255
Router(config)#ip nat inside source list 10 pool DYN_POOL
```

### 3. Configure PAT for all internal hosts.

```
Router(config)#access-list 20 permit 192.168.10.0 0.0.0.255
Router(config)#access-list 20 permit 192.168.20.0 0.0.0.255
Router(config)#ip nat inside source list 20 interface GigabitEthernet0/0 overload
Router(config)#end
```

### 4. Identify inside and outside interfaces correctly.

```
Router>show ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
---  209.165.200.10    192.168.10.10      ---                ---
```

## Part 3 – Verification and Testing

• Check DHCP address assignment.

```
Router>show ip dhcp pool

Pool ADMIN :
 Utilization mark (high/low)    : 100 / 0
 Subnet size (first/next)       : 0 / 0
 Total addresses                : 254
 Leased addresses               : 1
 Excluded addresses             : 3
 Pending event                  : none

 1 subnet is currently in the pool
 Current index        IP address range                    Leased/Excluded/Total
 192.168.10.1         192.168.10.1     - 192.168.10.254    1    / 3     / 254

Pool FACULTY :
 Utilization mark (high/low)    : 100 / 0
 Subnet size (first/next)       : 0 / 0
 Total addresses                : 254
 Leased addresses               : 1
 Excluded addresses             : 3
 Pending event                  : none

 1 subnet is currently in the pool
 Current index        IP address range                    Leased/Excluded/Total
 192.168.20.1         192.168.20.1     - 192.168.20.254    1    / 3     / 254
```

**• Ping external IP (e.g., 8.8.8.8) to verify Internet access.**

**• Use show ip nat translations and show ip nat statistics to verify NAT operation.**

```
Router>show ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
---  209.165.200.10    192.168.10.10      ---                ---
```

```
Router>show ip nat statistics
Total translations: 1 (1 static, 0 dynamic, 0 extended)
Outside Interfaces: GigabitEthernet0/0
Inside Interfaces: GigabitEthernet0/1 , GigabitEthernet0/2
Hits: 0  Misses: 0
Expired translations: 0
Dynamic mappings:
-- Inside Source
access-list 10 pool DYN_POOL refCount 0
 pool DYN_POOL: netmask 255.255.255.240
       start 209.165.200.20 end 209.165.200.30
       type generic, total addresses 11 , allocated 0 (0%), misses 0
```

- Test external access to the Admin Web Server's public IP.