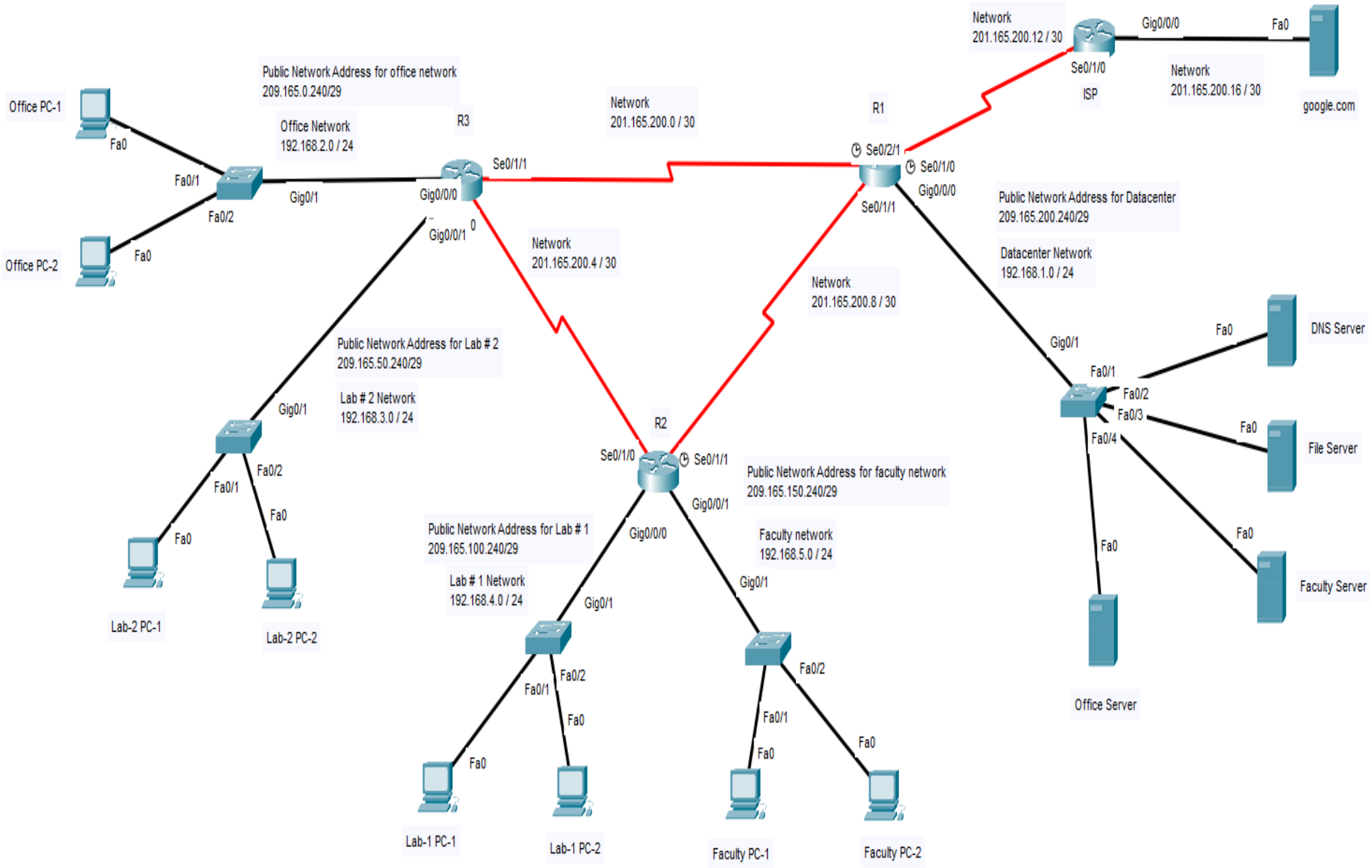
Assignment-2



Instructions: ***(Your report must be "Handwritten" like the first assignment)***

*You have to show the following things for every **Router**:*

1. Basic Router Configurations
2. **DHCP** configuration (While writing the dns part for dhcp, you must give the IP address of the DNS server in DataCenter Network)
3. Setup **Console** Password and **Enable** Password
4. Configure the upper topology using **Dynamic Routing protocol (RIP)**.

Configure the following things on necessary portion of the network:

- Configure an standard ACL-1 to prevent Office PC1 to access LAB # 1 Network. Also implement it on the proper Router and Interface.
- Configure an standard ACL-2 to prevent Faculty Network to access DNS Server. Also implement it on the proper Router and Interface.

- ✓ Configure an **Static NAT** for **DataCenter Network**
- ✓ Configure **Dynamuc NAT's** for **Office Network**, **Faculty Network**, **Lab#1 Network** & **Lab#2 Network**

Basic Configuration

Inside Router 3

```
R3 > en
R3 # conf t
R3 (config) # int gig0/0/0
R3 (config-if) # no shutdown
               # ip address 192.168.2.1 255.255.255.0
               # exit
R3(config) # int gig0/0/1
R3(config-if) # no shutdown
              # ip address 192.168.3.1 255.255.255.0
              # exit

R3(config) # int se 0/1/1
R3(config-if) # no shuldown
              # ip address 201.165.200.1 255.255.255.252
              # exit

R3(config) # int se0/1/0
R3(config-if) # no shutdown
              # ip address 201.165.200.5 255.255.255.252
              # exit

R3(config) #
```

Inside R2

```
R2>en
R2#conf t
R2(config)#int se 0/1/0
R2(config-if)#no shutdown
             #ip address 201.165.200.6 255.255.255.252
             #exit

R2(config)#int gig 0/0/0
R2(config-if)#no shutdown
             #ip address 192.168.4.1 255.255.255.252
             #exit

R2(config)#int gig 0/0/1
R2(config-if)#no shutdown
             #ip address 192.168.5.1 255.255.255.252
             #exit

R2(config)#int se 0/1/1
R2(config-if)#no shutdown
             #ip address 201.165.200.10 255.255.255.252
             #exit

R2(config)#
```

Inside R 1

```
R1 >en
R1 # conf t
R1 (config) # int se 0/1/1
R1 (config-if) # no shutdown
        # ip address 201.165.200.9 255.255.255.252
        # exit

R1 (config) # int gig 0/0/0
R1 (config-if) # no shutdown
        # ip address 192.168.1.1 255.255.255.0
        # exit

R1 (config) # int se 0/1/0
R1 (config-if) # no shutdown
        # ip address 201.165.200.13 255.255.255.252
        # exit

R1 (config) # int se 0/2/1
R1 (config-if) # no shutdown
        # ip address 201.165.200.2 255.255.255.252
        # exit

R1 (config) #
```

Inside ISP Router

```
ISP>en
ISP# conf t
ISP (config)# int se 0/1/0
ISP(config-if)# no shutdown
        # ip address 201.165.200.14 255.255.255.252
        # exit
ISP (config)# int g100/0/0
ISP (config-if)# no shutdown
        # ip address 201.165.200.17 255.255.255.252
        # exit
```

DHCP Configuration

Inside ISP router

since we have just one server (google.com), we dont need to configure DHCP here. Here mannual assigned address for the server,

IP : 201.165.200.18
Subnet : 255.255.255.252
DNS : 8.8.8.8 (google.com)

Inside R1

for DataCenter, we will be assigning the IP, subnet mask manually ← wont be assgning dns-server's address since each one is individual server.

for DNS server, IP: 192.168.1.2

File server, IP: 192.168.1.3

Faculty server, IP: 192.168.1.4

office server, IP: 192.168.1.5

Subnet for each one of 'em: 255.255.255.0

[For other routers to access DNS server (with dhcp), these nets are to translated to public (NAT).]

```
R1(config)# ip nat inside source static 192.168.1.2 209.165.200.242
# ip nat inside source static 192.168.1.3 209.165.200.243
# ip nat inside source static 192.168.1.4 209.165.200.244
# ip nat inside source static 192.168.1.5 209.165.200.245

# int gig 0/0/0
R1(config-if)# ip nat inside
# exit
R1(config)# int se 0/1/0
R1(config-if)# ip nat out
# exit
R1(config)# int se0/1/1
R1(config-if)# ip nat out
# exit
```

```
R1(config)# int se 0/2/1
R1(config-if)# ip nat out
# exit
R1(config)#
```

[now other routers can use DNS server's public IP as their dns-server]

Inside R2

```
R2(config)# ip dhcp pool FacultyNet
R2(dhcp-config)# network 192.168.5.0 255.255.255.0
               # default-router 192.168.5.1
               # dns-server 209.165.200.242
               # exit
R2(config)# ip dhcp pool Lab1_Net
R2(dhcp-config)# network 192.168.4.0 255.255.255.0
               # default-router 192.168.4.1
               # dns-server 209.165.200.242
               # exit
R2(config)#
```

Inside R3

```
R3(config)# ip dhcp pool Lab2_Net
R3(dhcp-config)# network 192.168.3.0 255.255.255.0
               # default-router 192.168.3.1
               # dns-server 209.165.200.242
               # exit
R3(config)# ip dhcp pool OfficeNet
R3(dhcp-config)# network 192.168.2.0 255.255.255.0
               # default-router 192.168.2.1
               # dns-server 209.165.200.242
               # exit
R3(config)#
```

Dynamic Routing (RIP) Config

Inside R3

```
R3(config)# router rip
 # version 2
 # network 192.168.2.0
 # network 192.168.3.0
 # network 201.165.200.4
 # network 201.165.200.0
 # exit
```

Inside R2

```
R2(config)# router rip
 # version 2
 # network 201.165.200.4
 # network 192.168.1.0
 # network 192.168.5.0
 # network 201.165.200.8
 # exit
```

Inside R1

```
R1(config) # router rip
           # version 2
           # network 201.165.200.8
           # network 201.165.200.0
           # network 201.165.200.12
           # network 192.168.1.0
           # exit
```

Inside ISP

```
ISP(config) # router rip
            # version 2
            # network 201.165.200.12
            # network 201.165.200.16
            # exit
```

Access Control List Configuration

// to prevent Office PC 1 from accessing LAB 1 Net.

Inside R2

```
R2(config)# access-list 1 deny host 192.168.2.2
          # access-list 1 permit any
          # int gig 0/0/0
R2(config-if)# ip access-group 1 out
             # exit
```

// to prevent Faculty Network from accessing "DNS server"

Inside R1

```
R1(config)# access-list 2 deny 192.168.5.0 0.0.0.255
          # access-list 2 permit any
          # int gig 0/0/0
R1(config-if)# ip access-group 2 out
             # exit
```

NOTE:

I ACL-2 will block Faculty Net not only from accessing the DNS server, but also from accessing the whole Data Center Net. To block "just DNS server", we (probably) need extended ACL.

Network Address Translation Config

Static Nat

Data Centers Network is already configured (Page 5)

[and on ISP's network, google's server is already assigned a public address (201.165.200.18)]

Dynamic Nat

Inside R3

```
R3(config)# int gig0/0/0
R3(config-if)# ip nat inside
             # exit
R3(config)# int gig0/0/1
R3(config-if)# ip nat outside
             # exit

R3(config)# int se0/1/1
R3(config-if)# ip nat out
             # exit
```

```
P3(config) # int se0/1/0
P3(config-if) # ip nat out
              # exit

P3(config) # ip nat pool OfficeNet 209.165.0.240
                 209.165.0.247 netmask 255.255.255.248

           # ip nat pool Lab2Net 209.165.50.240
                 209.165.50.247 netmask 255.255.255.248

           # access-list 1 permit 192.168.2.0 0.0.0.255

           # access-list 2 permit 192.168.3.0 0.0.0.255

           # ip nat inside source list 1 NAT pool OfficeNet

           # ip nat inside source list 2 NAT pool Lab2Net

           # exit
```

Inside R2

```
R2(config) # int se0/1/0
R2(config-if) # ip nat out
              # exit

R2(config) # int se0/1/1
R2(config-if) # ip nat out
              # exit
```

R2(config)# int g0/0/0

R2(config-if)# ip nat inside

exit

R2(config)# int g0/0/1

R2(config-if)# ip nat inside

exit

R2(config)# ip nat pool Lab1Net 209.165.100.240
209.165.100.247 netmask 255.255.255.248

ip nat pool FacultyNet 209.165.150.240
209.165.150.247 netmask 255.255.255.248

access-list 3 permit 192.168.4.0 0.0.0.255

access-list 4 permit 192.168.5.0 0.0.0.255

ip nat inside source list 3 NAT pool Lab1Net

ip nat inside source list 4 NAT pool FacultyNet

exit

creating a default route on R1 (to access ISP)

R1(config)# ip route 0.0.0.0 0.0.0.0 201.165.200.14

exit

to create ISP NAT configuration:

```
ISP (config) # ip route 201.165.200.12 255.255.255.252
                       201.165.200.12.13
             # exit
```

Password Set up & file write (save)

Inside R1

```
R1 (config) # console 0
R1 (config-line) # password rOut3r_1
                 # login
                 # exit
R1 (config) # enable secret < >
            # exit
R1 # wr
```

Inside R2

```
R2 (config) # console 0
R2 (config-line) # password rOut3r_2
                 # login
                 # exit
```

```
R2(config)# enable secret < >
          # exit
R2 # wr
```

Inside R3

```
R3 (config) # console 0
R3(config-line) # password r0ut3r-3
                # login
                # exit
R3 (config) # enable secret < >
            # exit
R3 # wr
```

Inside ISP

```
ISP (config) # console 0
ISP (config-line) # password isp-r0ut3r
                  # login
                  # exit
ISP (config) # enable secret < >
             # exit
ISP # wr
```

——— end ———