# Advanced Networks: Final Project

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**Section:** 00002
**Date:** 06/12/2022
**Semester:** Fall 2022


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## ***Configuration of Faculty router:***

Enabling the configuration, and assigning a hostname through a console cable
The hostname allows us to identify the device in a way that is easy to distinguish from others

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname FacultyRouter
FacultyRouter(config)#
```

Disable DNS lookup

```
FacultyRouter(config)#no ip domain-lookup
```

Assign and check interface descriptions
By assigning interface descriptions, we can label the interfaces by how they are being used.

```
FacultyRouter(config)#interface G0/0
FacultyRouter(config-if)#description "Student Network Interface"
```

```
FacultyRouter(config)#interface G0/1
FacultyRouter(config-if)#description "Professor Network Interface"
```

```
FacultyRouter#show interface G0/0
GigabitEthernet0/0 is administratively down, line protocol is down (disabled)
  Hardware is CN Gigabit Ethernet, address is 0030.f236.2201 (bia
0030.f236.2201)
  Description: "Student Network Interface"
```

```
FacultyRouter#show interface G0/1
GigabitEthernet0/1 is administratively down, line protocol is down (disabled)
  Hardware is CN Gigabit Ethernet, address is 0030.f236.2202 (bia
0030.f236.2202)
  Description: "Professor Network Interface"
```

Set minimum password length
This is good for security as it ensures a password has a minimum complexity

```
FacultyRouter(config)#security password min-length 8
```

Set Console 0 password
This password is needed anytime we are accessing the cli of the router

```
FacultyRouter(config)#line con 0
FacultyRouter(config-line)#password cisco12345
FacultyRouter(config-line)#login
FacultyRouter(config-line)#end
```

Set EXEC privilege mode secret password and enable password encryption
This password is needed anytime we are accessing the privilege exec mode of the router

```
FacultyRouter(config)#enable secret class12345
FacultyRouter(config)#service password-encryption
```

Set banner message of the day
The banner message of the day is the banner that appears when accessing the cli of the router

```
FacultyRouter(config)#banner motd "No unauthorized access allowed!"
```

```
No unauthorized access allowed!

User Access Verification

Password:

FacultyRouter>
```

Set exec-timeout for after 5 mins on all console and vty lines
This means after 5 mins of inactivity, the router will time out and the config session or privilege exec session will be closed

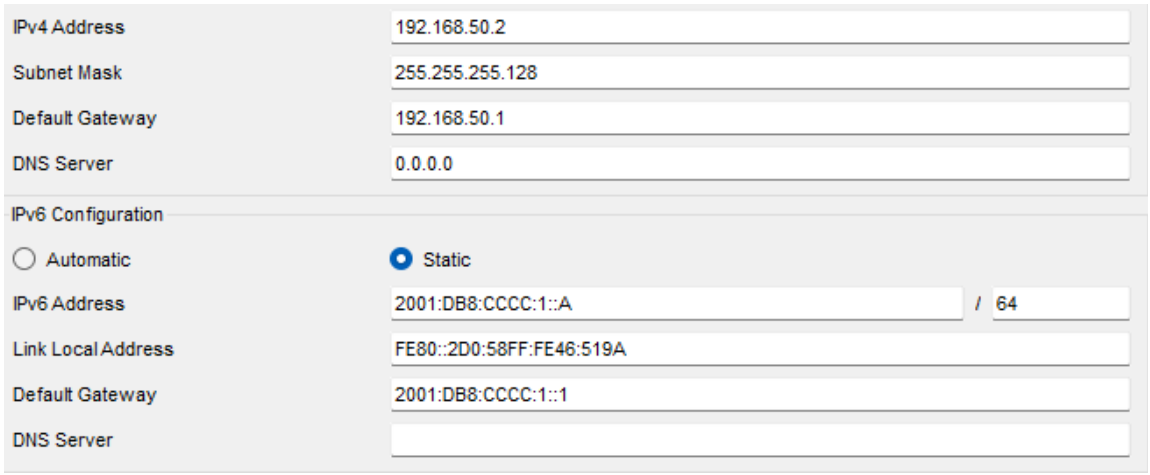
```
FacultyRouter(config)#line con 0
FacultyRouter(config-line)#exec-timeout 5 00
FacultyRouter(config-line)#exit
FacultyRouter(config)#line vty 0 15
FacultyRouter(config-line)#exec-timeout 5 00
```

Enable IPv6 unicast routing
We are allowing the router to route using IPv6

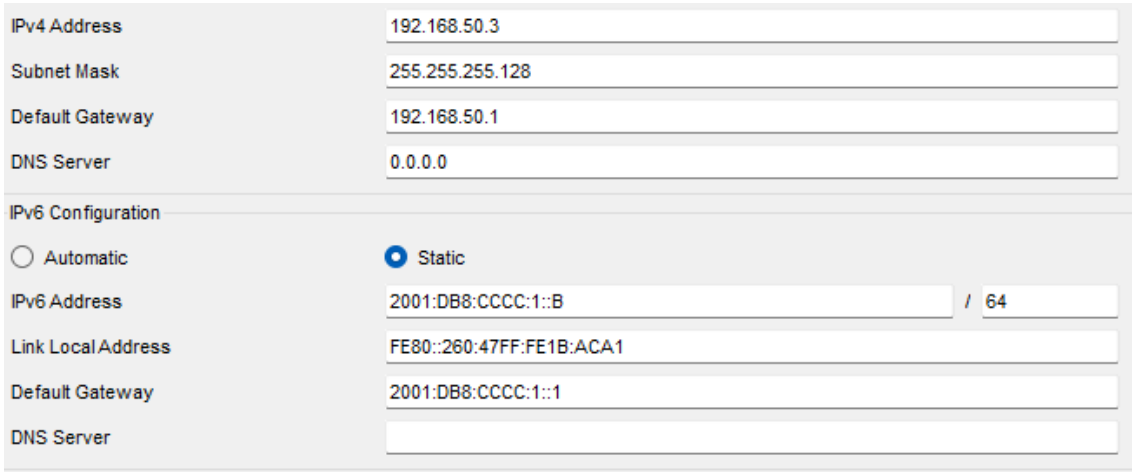
```
FacultyRouter(config)#ipv6 unicast-routing
```

Here are the 4 PC’s with their respective IPs assigned

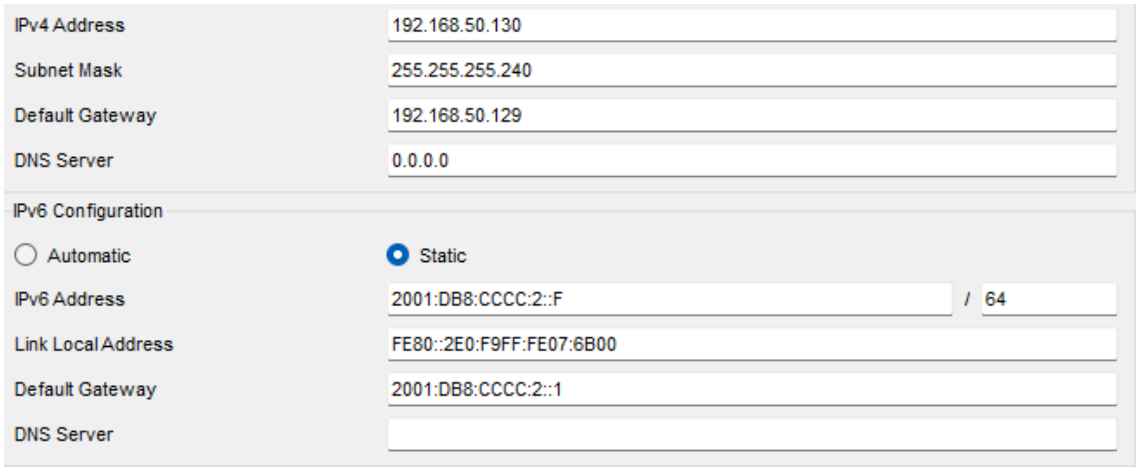
ST1:



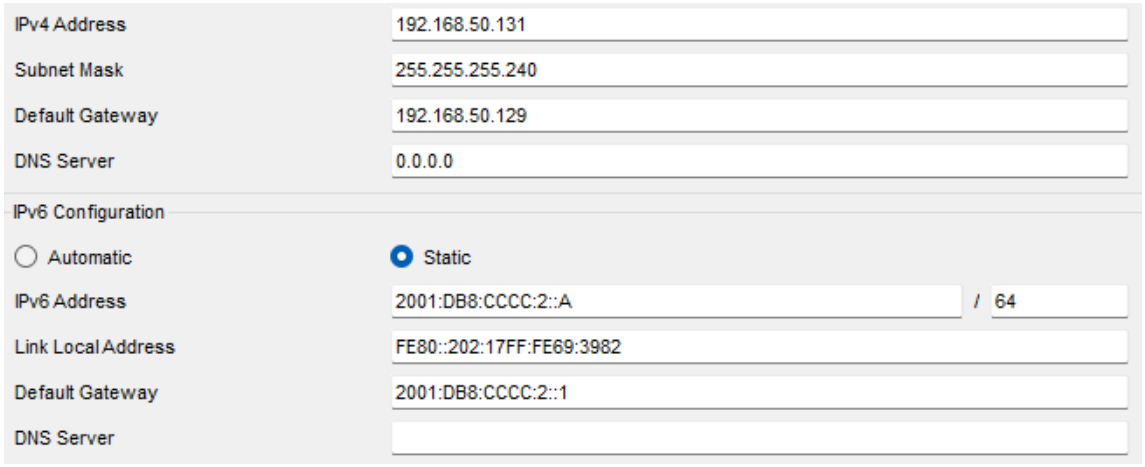

ST2:



PROF1:




PROF2:




Copy running config to the startup config
This will make the router boot with the config that has just been created rather than the original default boot configuration

```
FacultyRouter#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
FacultyRouter#
```

***Configuration of Student switch:***

Enabling the configuration, and assigning the hostname of the switch
Once again, the hostname allows us to clearly identify the device we are working with

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname StudentSwitch
StudentSwitch(config)#
```

Assigning the IPv4 address from the table to VLAN 1, and assigning the default gateway of the VLAN
This makes the VLAN of the switch be recognizable on the network and encapsulates the network

```
StudentSwitch(config)#interface VLAN1
StudentSwitch(config-if)#ip address 192.168.50.126 255.255.255.128
StudentSwitch(config-if)#ip default-gateway 192.168.50.1
```

Assigning the interface description
Once again, the interface description is used to identify what the interface is being used for, making it clear the purpose it is fulfilling

```
StudentSwitch(config)#interface VLAN1
StudentSwitch(config-if)#description "Student Network Switch"
```

Backup the running config to the startup config
This is so the switch boots with the new config

```
StudentSwitch#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
StudentSwitch#
```

***Configuration of Professor switch:***

Enabling the configuration and assigning the hostname of the switch
The hostname is used to identify the device in a clear manner

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname ProfSwitch
ProfSwitch(config)#
```

Assigning the IPv4 address from the table to VLAN 1, and assigning the default gateway of the VLAN, as well as the interface description
This makes the vlan of the switch visible on the network, it encapsulates the network, and it provides a description of the purpose of the interface

```
ProfSwitch(config)#interface vlan1
ProfSwitch(config-if)#ip address 192.168.50.142 255.255.255.240
ProfSwitch(config-if)#description "
ProfSwitch(config-if)#description "Professor Network Switch"
ProfSwitch(config-if)#ip default-gateway 192.168.50.129
```

Backup the running config to the startup config
This makes the switch boot with the new config instead of the default one

```
ProfSwitch#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
ProfSwitch#
```

Pinging ST1 from ST1

```
C:\>ping 192.168.50.2

Pinging 192.168.50.2 with 32 bytes of data:

Reply from 192.168.50.2: bytes=32 time=3ms TTL=128
Reply from 192.168.50.2: bytes=32 time=4ms TTL=128
Reply from 192.168.50.2: bytes=32 time=11ms TTL=128
Reply from 192.168.50.2: bytes=32 time=3ms TTL=128

Ping statistics for 192.168.50.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 11ms, Average = 5ms
```

Pinging ST2 from ST1

```
C:\>ping 192.168.50.3

Pinging 192.168.50.3 with 32 bytes of data:

Reply from 192.168.50.3: bytes=32 time<1ms TTL=128
Reply from 192.168.50.3: bytes=32 time<1ms TTL=128
Reply from 192.168.50.3: bytes=32 time<1ms TTL=128
Reply from 192.168.50.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.50.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Pinging PROF1 from ST1

```
C:\>ping 192.168.50.130

Pinging 192.168.50.130 with 32 bytes of data:

Reply from 192.168.50.130: bytes=32 time<1ms TTL=127
Reply from 192.168.50.130: bytes=32 time<1ms TTL=127
Reply from 192.168.50.130: bytes=32 time<1ms TTL=127
Reply from 192.168.50.130: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.50.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Pinging FACULTY from ST1

```
C:\>ping 192.168.50.1

Pinging 192.168.50.1 with 32 bytes of data:

Reply from 192.168.50.1: bytes=32 time<1ms TTL=255
Reply from 192.168.50.1: bytes=32 time<1ms TTL=255
Reply from 192.168.50.1: bytes=32 time<1ms TTL=255
Reply from 192.168.50.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.50.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Testing telnet on the router from ST1

```
C:\>telnet 192.168.50.1
Trying 192.168.50.1 ...Open

[Connection to 192.168.50.1 closed by foreign host]
C:\>telnet 192.168.50.1
Trying 192.168.50.1 ...OpenNo unauthorized access allowed!


FacultyRouter>en
Password:
FacultyRouter#
```

Configuring SSH on the Router
SSH allows us to securely connect to the router remotely.

```
FacultyRouter(config)#ip domain name admin
FacultyRouter(config)#crypto key generate rsa
The name for the keys will be: FacultyRouter.admin
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

FacultyRouter(config)#username admin password admin
*Mar 2 2:44:45.390: %SSH-5-ENABLED: SSH 1.99 has been enabled
% Password too short - must be at least 8 characters. Password not configured.
FacultyRouter(config)#username admin password adminPass
FacultyRouter(config)#ip ssh version 2
FacultyRouter(config)#line vty 0 15
FacultyRouter(config-line)#transport input ssh
FacultyRouter(config-line)#login local
```

Testing SSH on ST1

```
C:\>ssh -l admin 192.168.50.1

Password:

No unauthorized access allowed!

FacultyRouter>en
Password:
FacultyRouter#
```