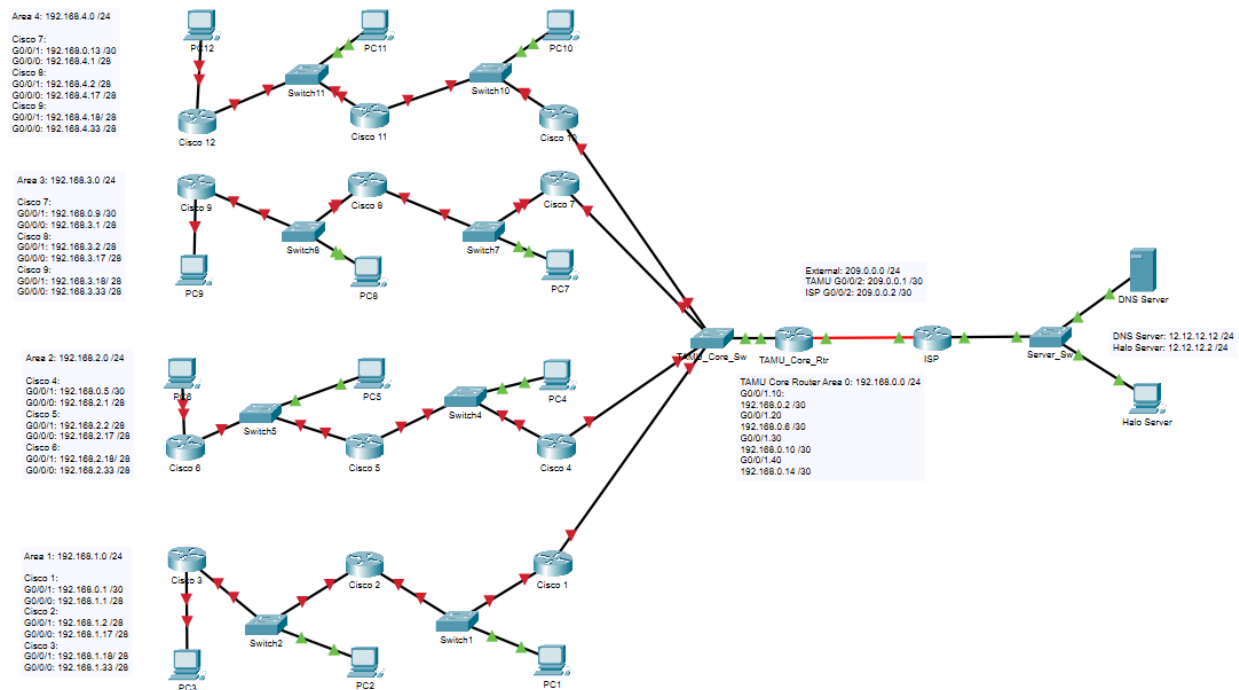# .ı|ı.ı|ı. Networking
CISCO™ Academy

Routing - Cisco 1: Fall 2022

Purpose:

Students will learn how to configure OSPF and DHCP on their respective routers, then test connectivity by sending DNS requests to access a website on an external network.

Part 1:

As always, we need to subnet our network address block 192.168.1.0 /24 into 4 subnets.

- On a scratch sheet of paper, subnet the network 192.168.1.0 /24 into 4 networks.
- Record the second network address
- Record the second address range

Part 2:

Next, we will configure the PC for DHCP.

- Follow the instructions below to enable the DHCP on the PC
  - Control Panel> Network and Internet> Network and Sharing Center> Change adapter settings> Ethernet> Properties> Internet Protocol Version 4 (TCP/IPv4)> Obtain an IP address automatically> OK.
  - DO NOT CLICK THE RED X, CLICK OK TO SAVE CONFIGURATIONS.

Part 3:

Next we need to install basic configurations on the router such as hostname and the enable mode password.

- Use the following commands to name the router
  - `router> enable`
  - `router# configure terminal`
  - `router(config)# hostname Cisco1`
  - `Cisco1(config)# enable secret aggies`
  - `Cisco1(config)# service password-encryption`
  - `Cisco1(config)# banner motd "Welcome to Cisco Academy at TAMU!"`

- Use the following commands to configure SSH on the router
  - `Cisco1(config)# username texas password aggies`
  - `Cisco1(config)# ip domain-name tamu.com`
  - `Cisco1(config)# crypto key generate rsa general-keys modulus 1024`
  - `Cisco1(config)# ip ssh version 2`
  - `Cisco1(config)# line vty 0 4`
  - `Cisco1(config-line)# login local`
  - `Cisco1(config-line)# transport input ssh`
  - `Cisco1(config-line)# end`
  - `Cisco1# copy run start`

Part 4:
Now we need to configure the port addresses and a DHCP pool on the router.

- Use the following commands to configure the port address on the router
  - `Cisco1# configure terminal`
  - `Cisco1(config)# interface g0/0/1`
  - `Cisco1(config-if)# ip address 192.168.0.1 255.255.255.252`
  - `Cisco1(config-if)# no shutdown`
  - `Cisco1(config-if)#exit`
  - `Cisco1(config)# interface g0/0/0`
  - `Cisco1(config-if)# ip address 192.168.1.1 255.255.255.240`
  - `Cisco1(config-if)# no shutdown`
  - `Cisco1(config-if)# exit`

- Use the following commands to configure the DHCP pool on the router
  - `Cisco1(config)# ip dhcp excluded-address 192.168.1.1 192.168.1.2`
  - `Cisco1(config)# ip dhcp pool Cisco1`
  - `Cisco1(dhcp-config)# network 192.168.1.0 255.255.255.240`
  - `Cisco1(dhcp-config)# default-router 192.168.1.1`
  - `Cisco1(dhcp-config)# dns-server 12.12.12.12`
  - `Cisco1(dhcp-config)# end`
  - `Cisco1# copy run start`
  - `Cisco1# show ip dhcp binding`

Part 5:

Now, instead of configuring the rest of the router using the console cable, we will use SSH.

- Unplug the blue console cable from the router.
- Open Putty
- In the address bar, type the following IP address
  - `192.168.1.1`
- Click Open
- When prompted, enter the following credentials that we configured earlier
  - `Username: texas`
  - `Password: aggies`
- Enter the password we configured for enable mode
  - `Password: aggies`

Part 6:

We will now configure OSPF on the router through SSH.

- Use the following commands to configure OSPF on the router
  - `Cisco1> enable`
  - `Cisco1# configure terminal`
  - `Cisco1(config)# router ospf 1`
  - `Cisco1(router-config)# router-id 1.1.1.3`
  - `Cisco1(router-config)# network 192.168.0.0 0.0.0.3 area 0`
  - `Cisco1(router-config)# network 192.168.1.0 0.0.0.15 area 1`
  - `Cisco1(router-config)# end`
  - `Cisco1# copy run start`

Part 7:
Next, we need to verify that OSPF has been configured correctly and is working properly.

- Type the following command to check the OSPF information on your router
  - `Cisco1# show run | section ospf`
- Type the following command to see what routes your router has discovered
  - `Cisco1# show ip route`
- Type the following command to make sure your router has found its neighbors
  - `Cisco1# show ip ospf neighbor`

Part 8:
Now we will verify connectivity on the network using the ping command.

- Open command prompt and type the following
  - `C:\Users\Cisco1> ping 192.168.1.1`

- Then test connectivity to the DNS server
  - `C:\Users\Cisco1> ping 12.12.12.12`

Part 9:
Finally, we will access the website aggie-facts.cisco and have WireShark running network analysis.

- Open up WireShark…
- Open Microsoft Edge
- In the URL bar, enter the domain name
  - `aggie-facts.cisco`
- Then enter the IP address of the website
  - `12.12.12.12`

Part 10:

Now, we need to wipe the router of all the configurations we've done.

- Use the following commands to wipe the router
  - ```
    Cisco1# write erase
    ```
  - ```
    Cisco1# reload
    ```

Conclusion:

Now you know how to proficiently enable a router to use OSPF, DHCP, and SSH.