

GOA COLLEGE OF ENGINEERING

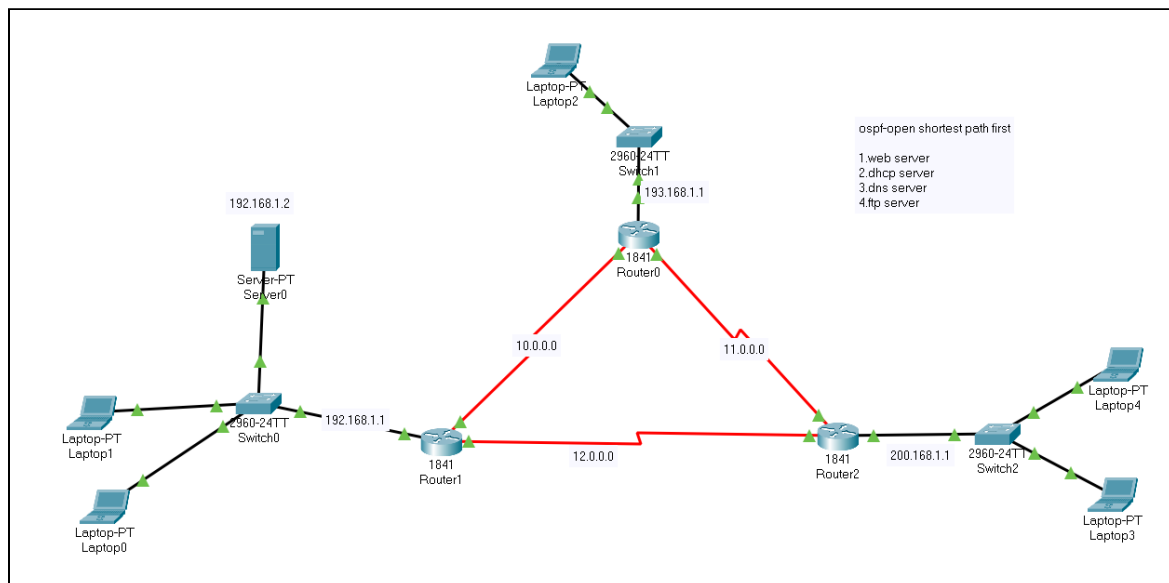
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Experiment 1

Date : 30/04/2021

AIM :

- Implement open-shortest-path-first(ospf) routing.
- Make a web server
- Make a dhcp server
- Make a dns server
- Make a ftp server

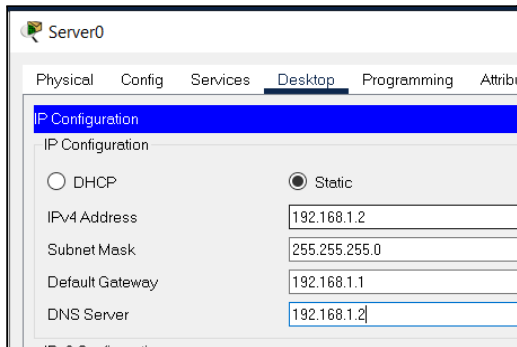
DIAGRAM :



PROCEDURE :

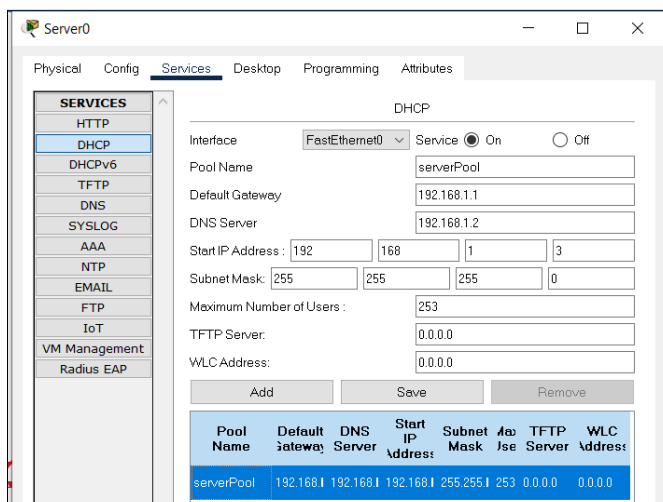
- Select 3 routers and add the WIC-2T module .
- Assume the ip addresses as mentioned above.
- Here the Server0 will act as web,dns,ftp,dhcp server all-in-one server (hence all the server have same ip=192.168.1.2. we can have separate servers each with one ip, for simplicity i'm taking all-in-one)
- Set the ip configuration of server0

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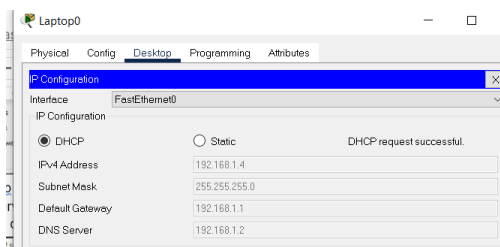


e. Let's set up the **dhcp config** for network 192.168.1.0 (switch 0 part) .

- Server0>Services>Dhcp
- By default we have some settings change it like this and save. Remember to turn on the service



- Now go to laptop0>desktop>ipconfig and click dhcp . values will be set automatically



- Do the same for other laptops on these networks.
- f. Now let's configure router1 connected to switch0
- assign ip address to all interfaces

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```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started!

Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
Router(config-if)#int se0/1/0
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Router(config-if)#int se0/1/1
Router(config-if)#ip address 12.0.0.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
Router(config-if)#
```

- Now as for ospf protocol

```
Router(config-if)#router ospf 1 // 1 here is some name
```

```
Router(config-router)#net 192.168.1.0 0.0.0.255 area 0 // net ip wildcard area 0 wildcard is complement of subnet
```

// wildcard tells us the number of PCs possible in that network, area 0 means all routers belong to a particular region and they won't know about any router in another area. (area0 router can't communicate with area1 router).

```
Router(config-router)#net 10.0.0.0 0.255.255.255 area 0
```

```
Router(config-router)#net 12.0.0.0 0.255.255.255 area 0
```

```
Router(config-router)#end
```

```
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
Router(config-if)#router ospf 1
Router(config-router)#net 192.168.1.0 0.0.0.255 area 0
Router(config-router)#net 10.0.0.0 0.255.255.255 area 0
Router(config-router)#net 12.0.0.0 0.255.255.255 area 0
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

- Save the config

```
Router#copy running-config startup-config
```

```
Destination filename [startup-config]?
```

```
Building configuration...
```

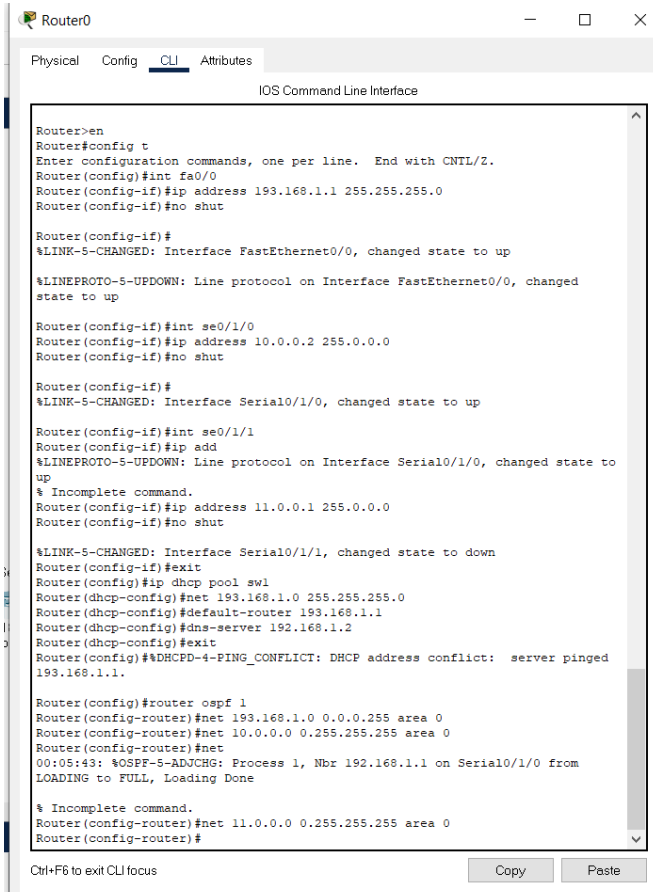
```
[OK]
```

- g. Let's configure router0 connected to switch1

- We can make a router also to act as dhcp, so lets do it.
- Assign ips and make a dhcp pool.
- Gateway of pool will be 193.168.1.1 , dns would be server0 that is 192.168.1.2.
- Let's name the pool as sw1 (switch1).
- In the pool we enter the network whose ip has to be automated (net ...)
- Then the default router(gateway) and dns server is set. (refer picture down)

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- Now click laptop2>desktop>ip config and dhcp . values will be set automatically
- Create the ospf protocol like that of router1.
- Save the config



```
Router0>en
Router0#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router0(config)#int fa0/0
Router0(config-if)#ip address 193.168.1.1 255.255.255.0
Router0(config-if)#no shut

Router0(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up

Router0(config-if)#int se0/1/0
Router0(config-if)#ip address 10.0.0.2 255.0.0.0
Router0(config-if)#no shut

Router0(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

Router0(config-if)#int se0/1/1
Router0(config-if)#ip add
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to
up
% Incomplete command.
Router0(config-if)#ip address 11.0.0.1 255.0.0.0
Router0(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
Router0(config-if)#exit
Router0(config)#ip dhcp pool sw1
Router0(dhcp-config)#net 193.168.1.0 255.255.255.0
Router0(dhcp-config)#default-router 193.168.1.1
Router0(dhcp-config)#dns-server 192.168.1.2
Router0(dhcp-config)#exit
Router0(config)#%DHCPD-4-PING_CONFLICT: DHCP address conflict: server pinged
193.168.1.1.

Router0(config)#router ospf 1
Router0(config-router)#net 193.168.1.0 0.0.0.255 area 0
Router0(config-router)#net 10.0.0.0 0.255.255.255 area 0
Router0(config-router)#net
00:05:43: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial0/1/0 from
LOADING to FULL, Loading Done

% Incomplete command.
Router0(config-router)#net 11.0.0.0 0.255.255.255 area 0
Router0(config-router)#
```

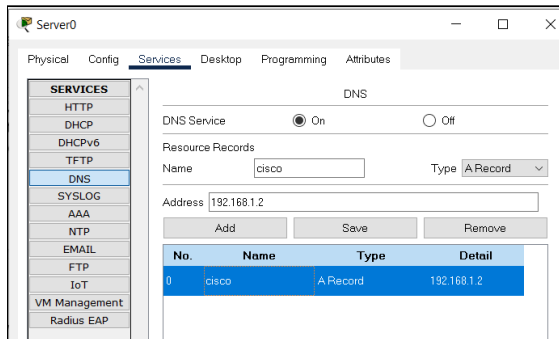
h. Let's configure router2 connected to switch2

- Do the same way like step 7
- Gateway would be 200.168.1.1 and dns 192.168.1.2
- Save the config at last
- Now click laptop3,4>desktop>ip config and dhcp . values will be set automatically

i. Lets configure **dns server**

- We know dns translates a string to an ip address so that we can have a connection.
- Goto Server0>Services>dns . and add the following. Turn on the dns service.

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- Now from any laptop if u do ping cisco. The dns server will put it ip that is 192.168.1.2 That is ping 192.168.1.2 on the backend and establish a connection.

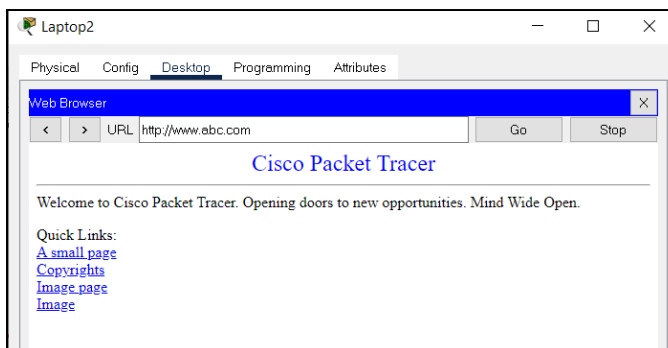
```
Packet Tracer PC Command Line 1.0
C:\>ping cisco

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=128
Reply from 192.168.1.2: bytes=32 time=1ms TTL=128
Reply from 192.168.1.2: bytes=32 time=1ms TTL=128
Reply from 192.168.1.2: bytes=32 time=1ms TTL=128

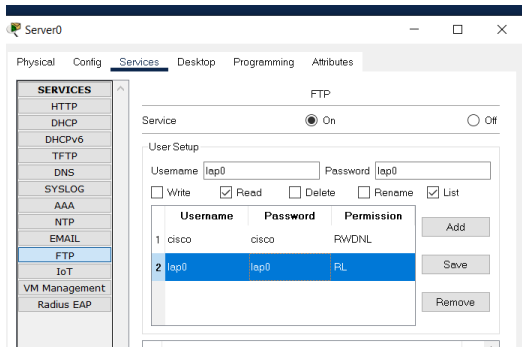
Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

- j. For the **web server** part goto Server0>services>http and see to it that it is turned on.
 - There are few files by default . you can open and see them/edit them.
 - Let's have a name for the website . let the name be www.abc.com
 - But we can't just type this in a browser , first we need to make a dns entry
 - Go to the dns setting add another entry with name www.abc.com and address as 192.168.1.2
 - Now click any laptop>desktop>webBrowser and type http://www.abc.com , you will get the cisco default page.

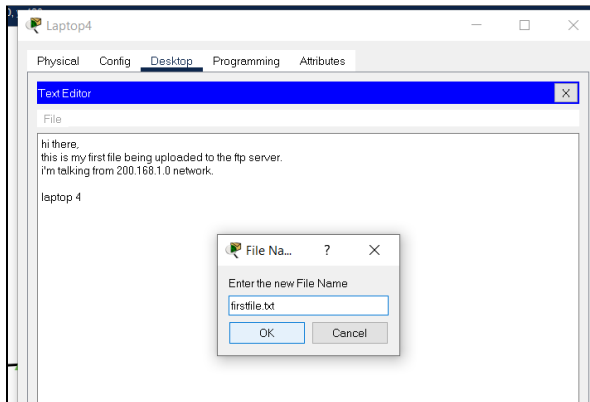


- k. For **ftp server**
 - Ftp stands for file transfer protocol. We can upload/download files.
 - Goto Server0>services>ftp and turn it on.
 - We can set some credentials to connect to this ftp server. By default we have username : cisco and password: cisco, we can add more accounts and set permissions.

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- Let's have a name for this server (say **myfiles**) .
- Add this into dns server name **myfiles** and address as 192.168.1.2..
- Note we are using the same ip 192.168.1.2 as we are using the same server , if we have a different server than the address would be different.
- Now let's upload some file and check
- Click any laptop>desktop>text editor and type something , click file and save it with some name, let's take **firstfile.txt**



- We have a text file in laptop4 , let's upload it
- Open command prompt of laptop4>desktop>command prompt (used default credentials)
C:\>ftp myfiles
Trying to connect...myfiles
Connected to myfiles
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put firstfile.txt

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Writing file firstfile.txt to myfiles:

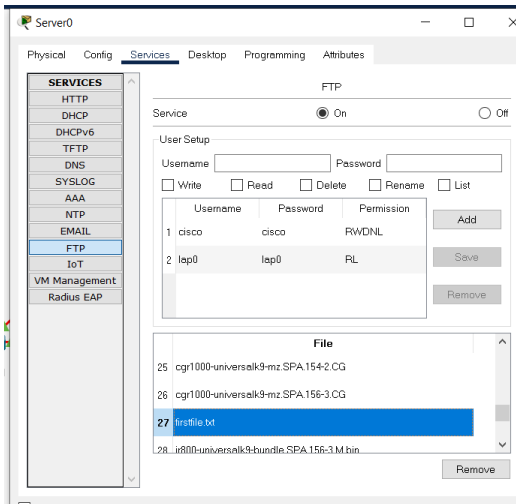
File transfer in progress...

[Transfer complete - 114 bytes]

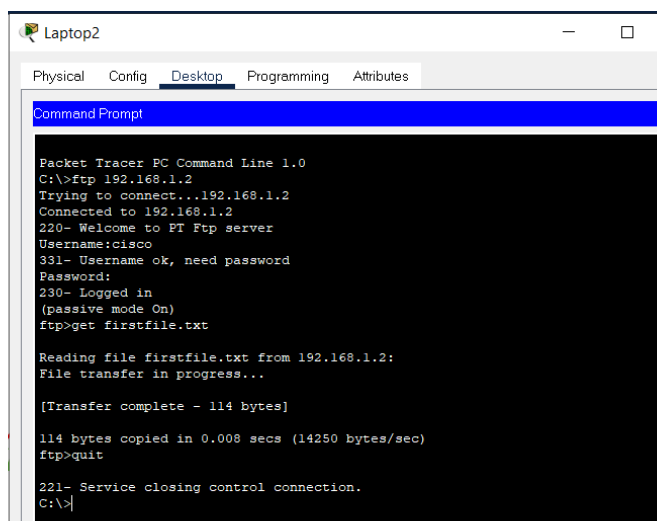
114 bytes copied in 0.014 secs (8142 bytes/sec)

ftp>

- we have successfully uploaded the firstfile.txt let's see if it is stored in the server

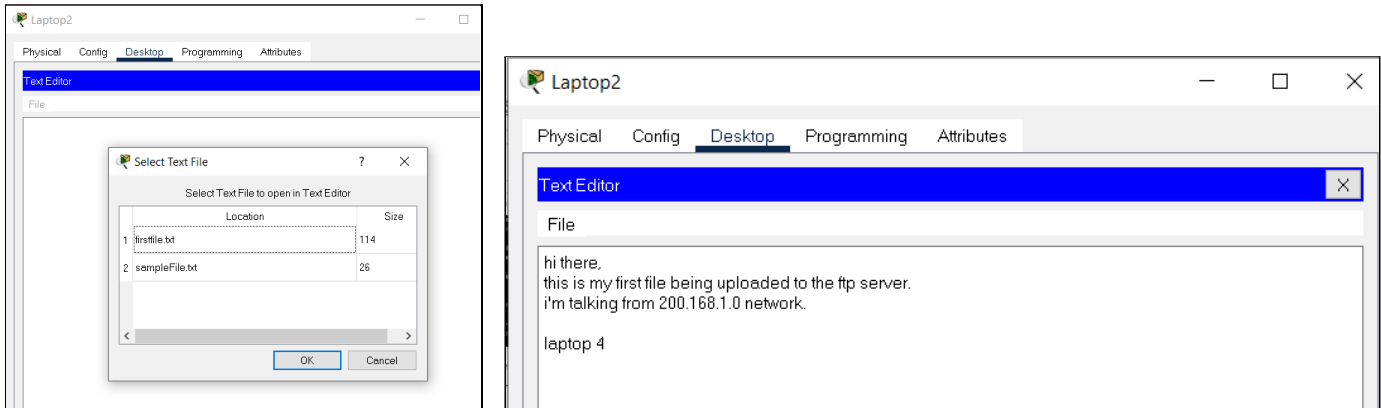


- There we have our file on the server , let's try downloading it .
- This time let's open laptop2 of network 193.168.1.0
- Open command prompt , connect to ftp myfiles.
 - Use the **get** command to download file



- Now open the text editor of this laptop , click file>open> select the file.

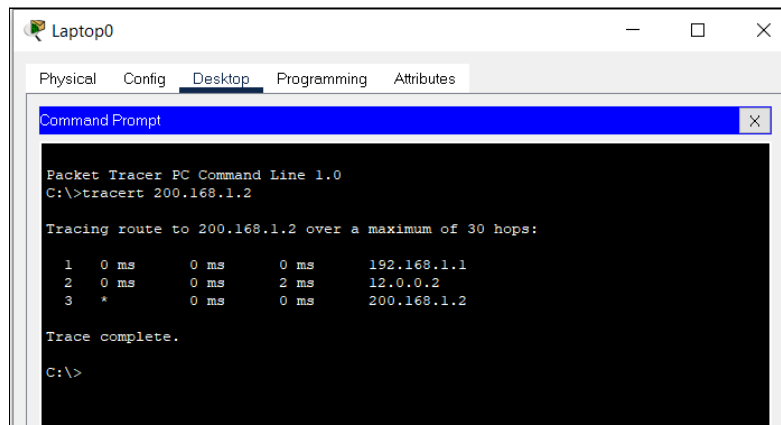
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-
- The contents of the file are the same so this was a success.

I. Let's check if **ospf** is working properly

- Open command prompt of laptop0 and type
 - Tracert 200.168.1.2 (laptop3 in my diagram)



- The route here shows that the packet from laptop0 travelled through router1(192.168.1.1) then hopped to router2 interface 12.0.0.2 and then via a switch it reached its destination pc 200.168.1.2.
- There was one more path from router1 to router0 to router2 to destination, but this was a long path
- Above two observations prove shortest path was taken

CONCLUSION : Web/dhcp/dns/ftp server and ospf protocol were implemented successfully.