

REPORT WRITING

Group Members:

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Section:

BS (CYS) "T"

PHYSICAL CONNECTION:

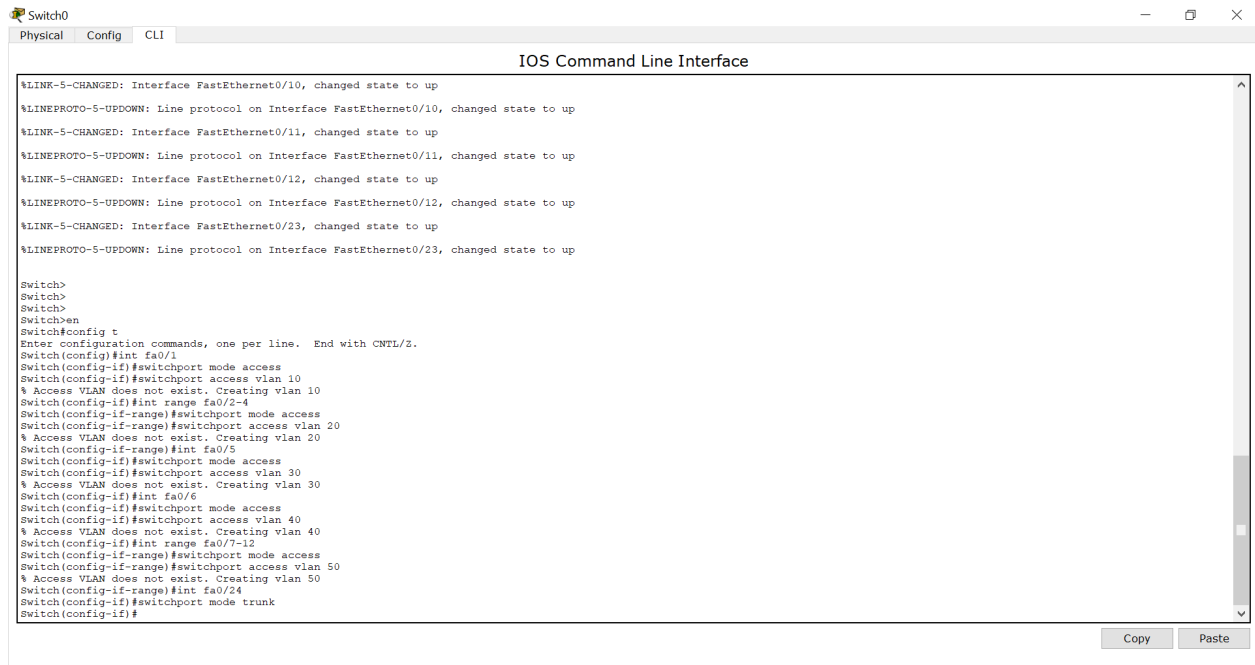
1. We designed the network for the private company while taking into account both the present and future needs of the business to accommodate more personnel.
2. Each employee must link his computer to the LAN network in order to set up network switches on floors and provide connectivity to all network ports in the rooms.
3. In order to provide WIFI coverage throughout the entire building, we can also set up a wireless access point connected to a switch.
4. We connected all the devices according to the assignment_01.

VLANs:

A virtual local area network, or VLAN, is a switched network that conceptually divides users into groups according to their roles in a project team or set of applications. Although end stations in a VLAN can be grouped even if they are not physically on the same LAN segment, physical LANs have the same characteristics. Unicast, broadcast, and multicast packets are only sent and flooded to end stations in the VLAN, and any switch port can be a member of one.

Step1:

- For this phase, there are two commands available in the interface configuration mode: Switchport access vlan #> command marks the port as a member of VLAN 10, and switchport mode access command establishes the port as an access port.



```
Switch0
Physical Config CLI
IOS Command Line Interface

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/23, changed state to up

Switch>
Switch>
Switch>
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
% Access VLAN does not exist. Creating vlan 10
Switch(config-if)#int range fa0/2-4
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 20
% Access VLAN does not exist. Creating vlan 20
Switch(config-if-range)#int fa0/5
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
% Access VLAN does not exist. Creating vlan 30
Switch(config-if)#int fa0/6
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 40
% Access VLAN does not exist. Creating vlan 40
Switch(config-if)#int range fa0/7-12
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 50
% Access VLAN does not exist. Creating vlan 50
Switch(config-if-range)#int fa0/24
Switch(config-if)#switchport mode trunk
Switch(config-if)#
```

- VLAN1 - This is the default VLAN. The switch is connected to the router through this VLAN. This can be used but cannot be modified or deleted.
- VLAN10 - Virtual network for the Conference department.
- VLAN20 - Virtual network for the Admin department.

- VLAN30 - Virtual network for the Finance department
- VLAN40 - Virtual network for the CEO office.
- VLAN50 - Virtual network for the employees department of ground floor.
- VLAN60 - Virtual network for the HR department
- VLAN70 - Virtual network for the employees department of first floor.
- VLAN80 - Virtual network for the IT department.

TRUNK COMMAND:

- Trunk port traffic continues to be composed of 1s and 0s. A VLAN Tag is appended to every traffic exiting a trunk port in order to identify which 1s and 0s belong to which VLANs.
- Switchport mode trunk will configure the port as a trunk port in the same way as switchport mode access does.

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/13, changed state to up

Switch>
Switch>
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 60
% Access VLAN does not exist. Creating vlan 60
Switch(config-if)#int range fa0/2-13
Switch(config-if-range)#switchport mode access

% Invalid input detected at '^' marker.
Switch(config-if-range)#switchport mode access
^
% Invalid input detected at '^' marker.
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 70
% Access VLAN does not exist. Creating vlan 70
Switch(config-if-range)#int fa0/24
Switch(config-if-range)#switchport mode trunk
Switch(config-if)#
Switch con0 is now available

```

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STEP 2:

- The switchport access vlan #> command can be used to configure this attribute regardless of whether a switch port is statically configured (or negotiated) as an access port or not.

- The commands above created the following configuration in the running-configuration for each switch:

```

Router0
Physical Config CLI
IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up
Router(config-subif)#ip add 192.168.60.1 255.255.255.0
% Configuring IP routing on a LAN subinterface is only allowed if that
subinterface is already configured as part of an IEEE 802.1Q, IEEE 802.1Q,
or ISL VLAN.
Router(config-subif)#no sh
Router(config-subif)#exit
Router(config)#int fa0/0.30
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.30, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.30, changed state to up
Router(config-subif)#encapsulation dot1q 30
Router(config-subif)#ip add 192.168.90.1 255.255.255.0
Router(config-subif)#no sh
Router(config-subif)#exit
Router(config)#int fa0/0.40
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.40, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.40, changed state to up
Router(config-subif)#encapsulation dot1q 40
Router(config-subif)#ip add 192.168.120.1 255.255.255.0
Router(config-subif)#no sh
Router(config-subif)#exit
Router(config)#int fa0/0.20
Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip add 192.168.60.1 255.255.255.0
Router(config-subif)#no sh
Router(config-subif)#exit
Router(config)#int fa0/0.50
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.50, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.50, changed state to up
Router(config-subif)#encapsulation dot1q 50
Router(config-subif)#ip add 192.168.150.1 255.255.255.0
Router(config-subif)#no sh
Router(config-subif)#exit
Router(config)#
Copy Paste

```

DHCP:

- The administrative burden associated with assigning IP addressing information to customers statically is avoided when using DHCP to automatically allocate IP addresses to user nodes.

Manual IP allocation:

- With this kind of DHCP allocation, the network administrator distributes users IP addresses from the DHCP server, and the DHCP server subsequently conveys this information to the clients.

Step1:

- Choose the server on which you want to configure a DHCP.
- Go to the services options on the top.
- Enter all the VLAN's name in the pool name, default gateway, DNS server, start of the IP address and users etc.
- Select the add option and click on save.

Server0

Physical Config Services Desktop Custom Interface

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP

DHCP

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Start IP Address : 10 0 0 0

Subnet Mask: 255 0 0 0

Maximum number of Users : 512

TFTP Server: 0.0.0.0

Add		Save			Remove	
Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server
vlan 70	192.168.210.1	5.5.5.5	192.168.210.10	255.255.255.0	246	0.0.0.0
vlan 60	192.168.180.1	5.5.5.5	192.168.180.10	255.255.255.0	246	0.0.0.0
vlan 50	192.168.150.1	5.5.5.5	192.168.150.10	255.255.255.0	246	0.0.0.0
vlan 40	192.168.120.1	5.5.5.5	192.168.120.10	255.255.255.0	246	0.0.0.0
vlan 30	192.168.90.1	5.5.5.5	192.168.90.10	255.255.255.0	246	0.0.0.0

Step 2:

- To up the servers, we use following commands:
 - Int eth0/2/0
 - IP address 10.10.10.1 255.0.0.0
 - No shut
- Now same for the second server, we also use these commands.

Router0

PhysicalConfigCLI

IOS Command Line Interface

```
Router(config)#int fa0/1.70
Router(config-subif)#encapsulation dot1q 70
Router(config-subif)#ip add 192.168.210.1 255.255.255.0
Router(config-subif)#no sh
Router(config-subif)#exit
Router(config)#int fa0/1
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/1.60, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.60, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/1.70, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.70, changed state to up

Router(config-if)#int fa0/1
Router(config-if)#int eth0/2/0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Ethernet0/2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2/0, changed state to up

Router(config-if)#
Router(config-if)#int eth0/2/0
Router(config-if)#ip add 10.10.10.1 255.0.0.0
Router(config-if)#no shut
Router(config-if)#int eth0/3/0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Ethernet0/3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/3/0, changed state to up

Router(config-if)#int eth0/3/0
Router(config-if)#ip add 172.16.0.1 255.255.0.0
Router(config-if)#no shut
Router(config-if)#
```

Step 3:

- It is possible for routers in a network to relay DHCP broadcast messages from the local network to a DHCP server that may be on another network by using an IP helper address. In this case, the router typically forwards requests to the DHCP server so that it may provide user devices with IP addressing information.
- This is a list of the instructions required to set up the router as a DHCP relay.

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/3/0, changed state down

Router(config-if)#
Router(config-if)#int eth0/2/0
Router(config-if)#ip add 10.10.10.1 255.0.0.0
Router(config-if)#no shut
Router(config-if)#int eth0/3/0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Ethernet0/3/0, changed state down

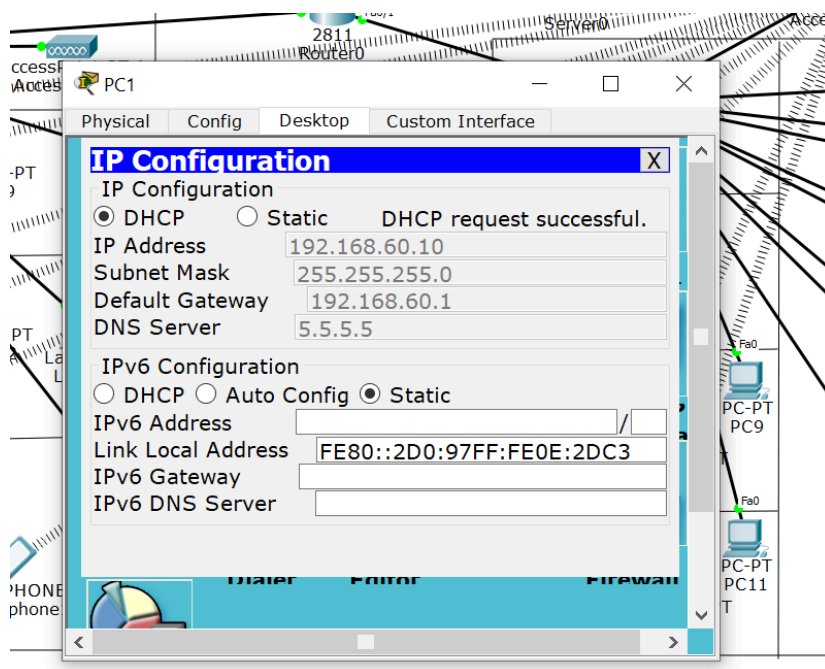
%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/3/0, changed state down

Router(config-if)#int eth0/3/0
Router(config-if)#ip add 172.16.0.1 255.255.0.0
Router(config-if)#no shut
Router(config-if)#int fa0/0.10
Router(config-subif)#ip helper
% Incomplete command.
Router(config-subif)#ip helper-address 10.10.10.2
Router(config-subif)#int fa0/0.20
Router(config-subif)#ip helper-address 10.10.10.2
Router(config-subif)#int fa0/0.30
Router(config-subif)#ip helper-address 10.10.10.2
Router(config-subif)#int fa0/0.40
Router(config-subif)#ip helper-address 10.10.10.2
Router(config-subif)#int fa0/0.50
Router(config-subif)#ip helper-address 10.10.10.2
Router(config-subif)#int fa0/1.60
Router(config-subif)#ip helper-address 10.10.10.2
Router(config-subif)#int fa0/1.70

```

Step 4:

- A host system's desktop settings are examined, and the DHCP option is chosen. The system forwards a DHCP request, which is acknowledged and given an IP address, associated subnet mask, and default gateway address.



DNS:

- Host names are converted into IP addresses by a Domain Name System (DNS) server. Although an IP address can be used to visit a network host, DNS makes things simpler by allowing us to utilize domain names that are simpler to remember.

Step 1:

- Created a DNS record on the http that was made earlier. Gave it the domain name and IP address and added it in the DNS server.

ever0

ysical Config Services Desktop Custom Interface

ERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name Type **A Record**

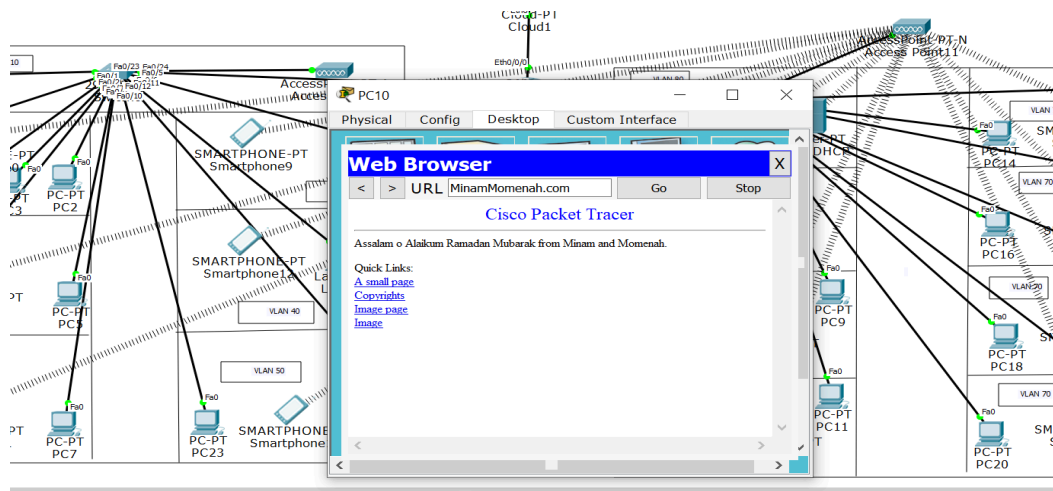
Address

No.	Name	Type	Detail
0	minammomenah.com	A Record	5.5.5.5

Step 2:

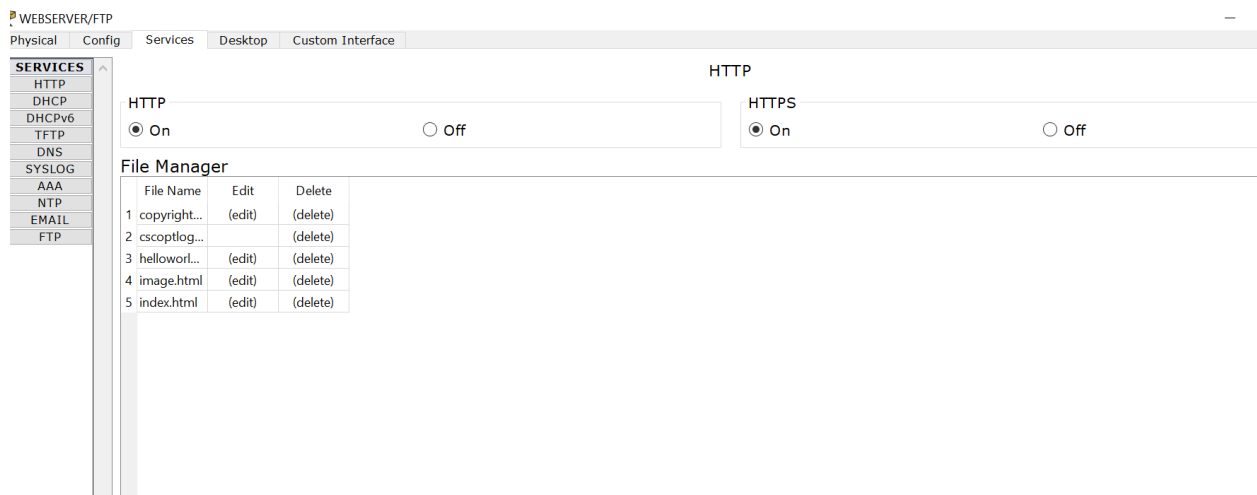
- After creating the record, go to any PC device and type the domain name in the web browser.

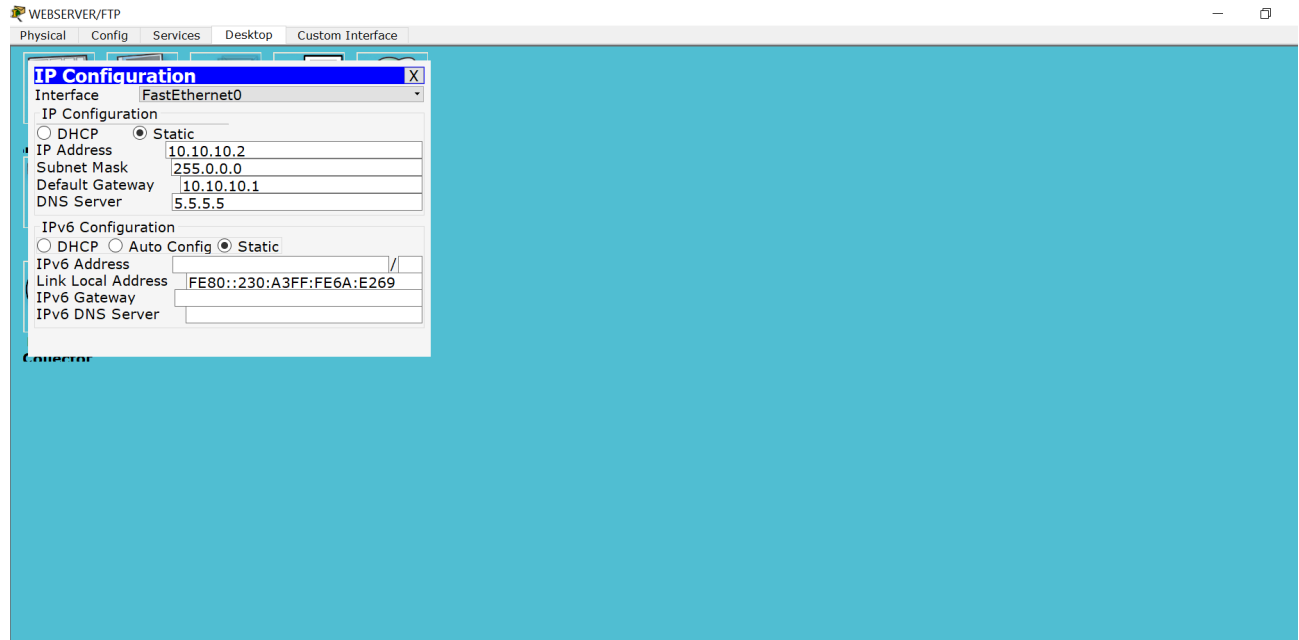
The DNS connected to it will give it the IP address of it through which the http file made can be accessed. It can be seen in the screenshot that the file that was made has been opened.



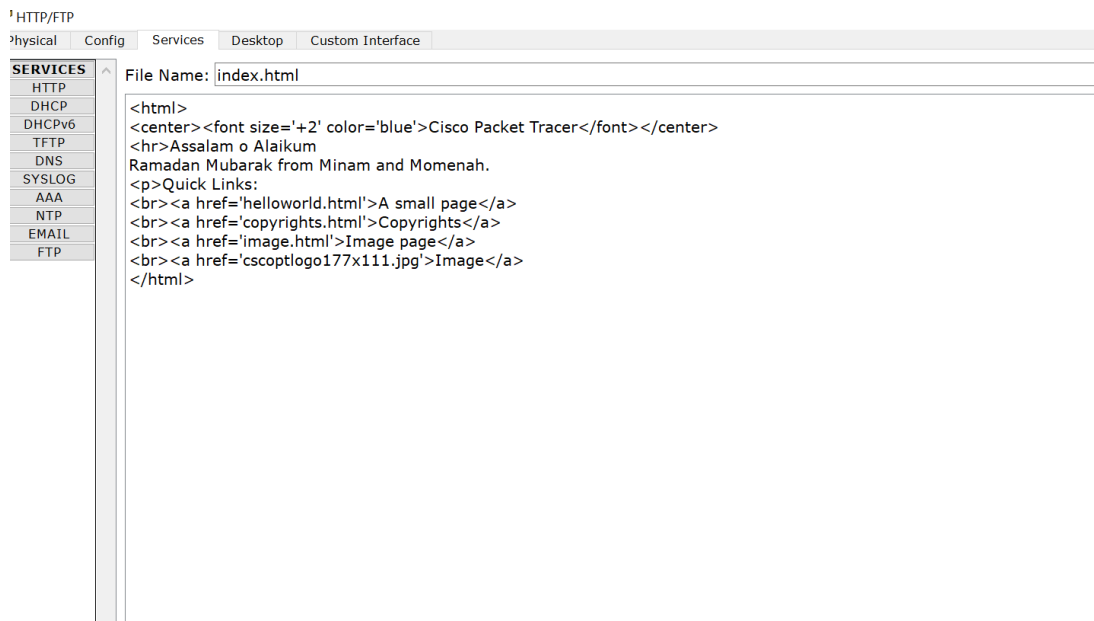
Web Server:

- The following step is to navigate to server > services > HTTP and select both services as on. We may now do online searches from any connected Computer. When you provide the server IP, only existing HTTP files will be created for you. Open a web browser on any PC, enter the server IP (192.168.1.1), and then press Enter. You will get the results below.

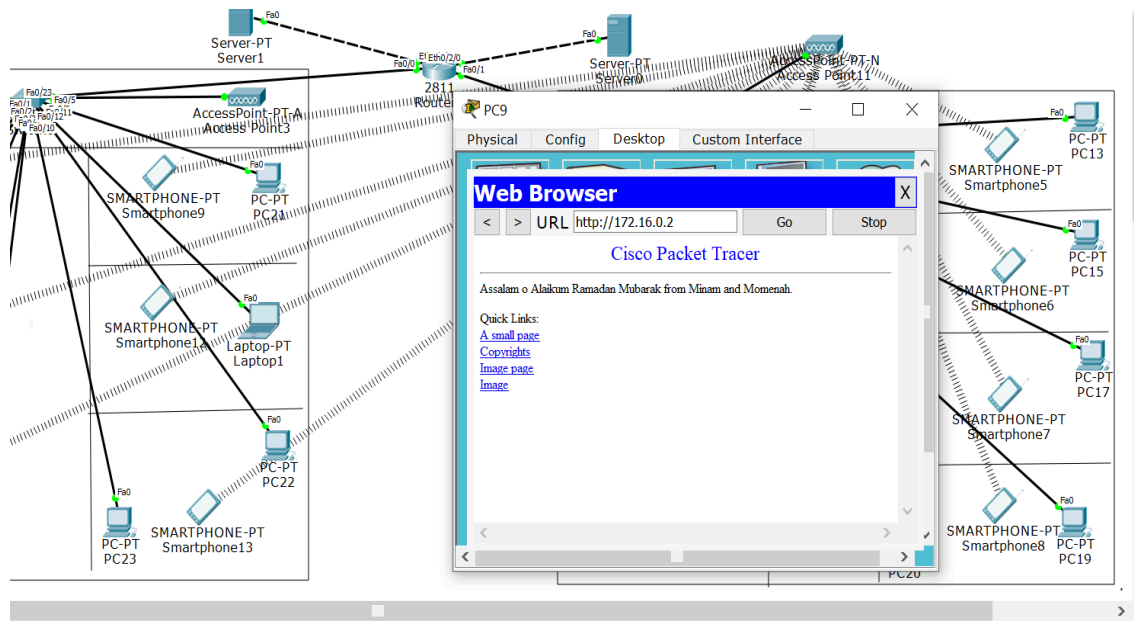




- It is quite easy to make your own website if you want to. Only follow the way:
- Navigate to the server's services > HTTP > new file > and enter any html code you choose, just as I have done then click the save button.
- If you search on a Computer, you might not discover your file. Navigate to server > Services > HTTP > index.html > edit > type it as follows:

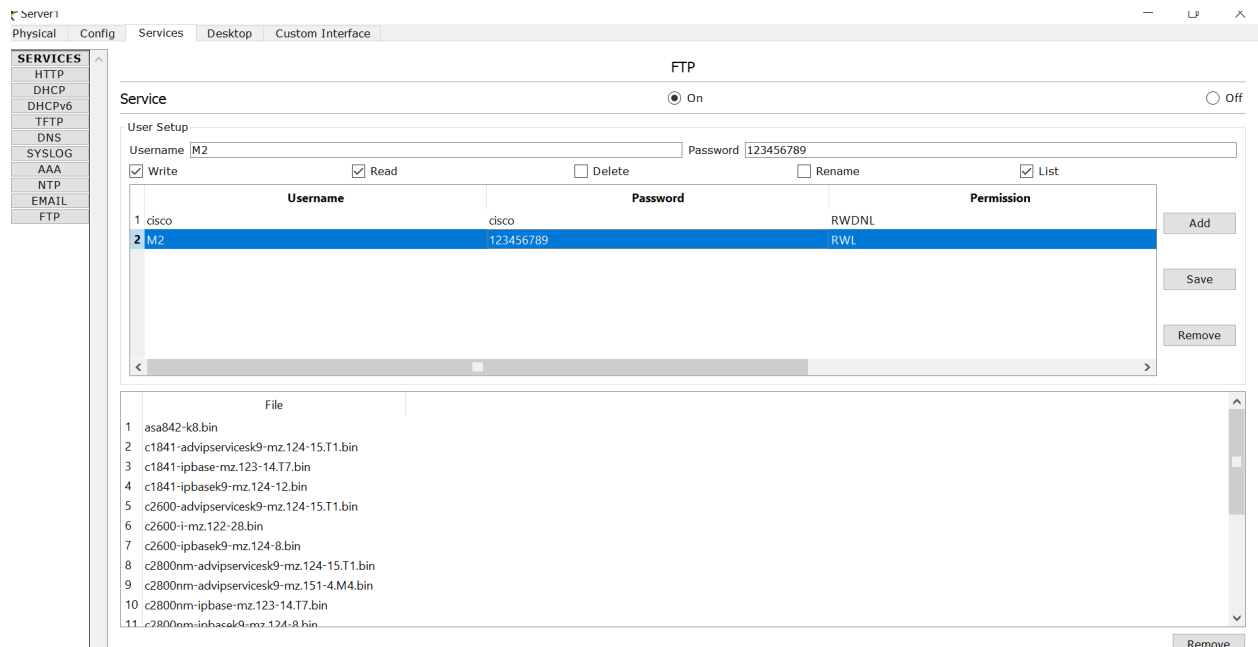


- Open a web browser on any PC, enter the server IP (172.16.0.2), and then press Enter. You will get the results below.

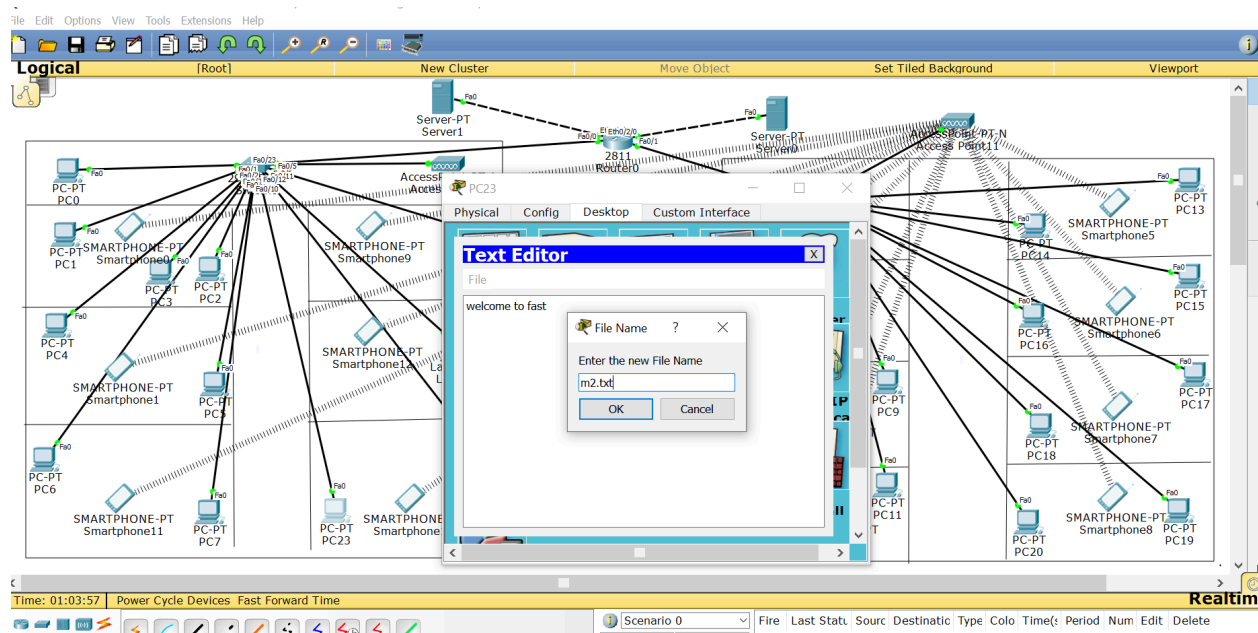


FTP:

- Configure static IP addresses on the server.
- Go to the server and select the services option from the top, then select ftp from the left side.
- Now add username and password.
- Then you can select the options given below the username.
- These options give different accesses to people regarding the file.



- In any pc, you can create a file.txt and save it.



- Now open the command prompt, enter the following commands:
- Provide the **username** and **password** for FTP login.

```
PC23
Physical Config Desktop Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>PING 172.16.0.2
Pinging 172.16.0.2 with 32 bytes of data:
Request timed out.
Reply from 172.16.0.2: bytes=32 time=1ms TTL=127
Reply from 172.16.0.2: bytes=32 time=0ms TTL=127
Reply from 172.16.0.2: bytes=32 time=0ms TTL=127

Ping statistics for 172.16.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>FTP 172.16.0.2
Trying to connect...172.16.0.2
Connected to 172.16.0.2
220- Welcome to FT Ftp server
Username:M2
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put m2.txt

Writing file m2.txt to 172.16.0.2:
File transfer in progress...

[Transfer complete - 15 bytes]

15 bytes copied in 0.106 secs (141 bytes/sec)
ftp>
```

- By entering the commands shown in the screenshot below, your file is now on the ftp server. Now users can access the file according to the permissions granted.

```

Ping statistics for 172.16.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>FTP 172.16.0.2
Trying to connect...172.16.0.2
Connected to 172.16.0.2
220- Welcome to FT Ftp server
Username:M2
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put m2.txt

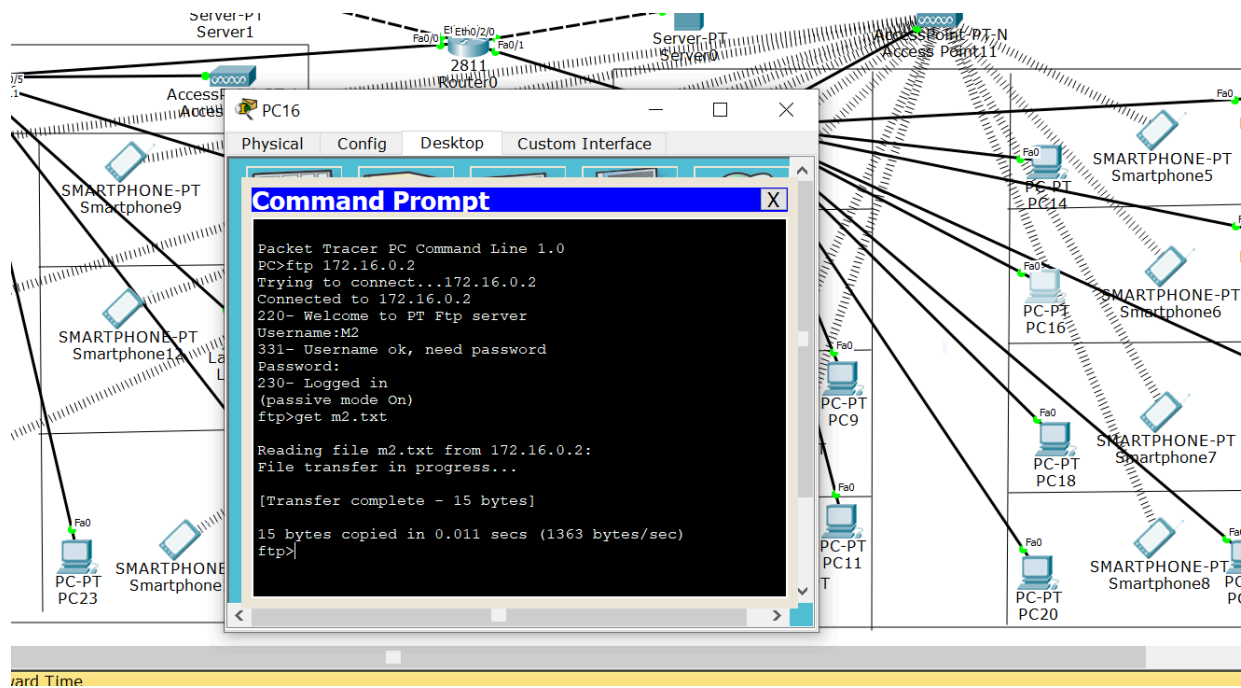
Writing file m2.txt to 172.16.0.2:
File transfer in progress...

[Transfer complete - 15 bytes]

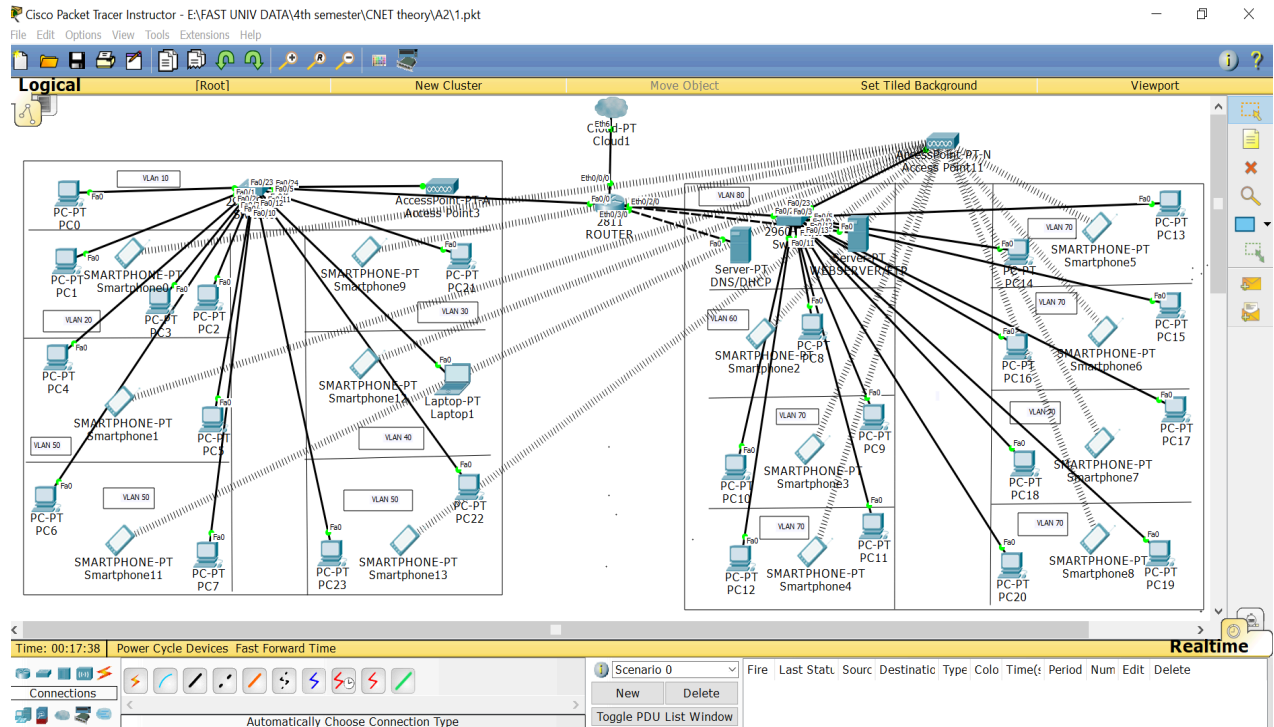
15 bytes copied in 0.106 secs (141 bytes/sec)
ftp>dir

Listing /ftp directory from 172.16.0.2:
 0  : asa842-k8.bin                               5571584
 1  : c1841-advipservicesk9-mz.124-15.T1.bin      33591768
 2  : c1841-ipbase-mz.123-14.T7.bin               13832032
 3  : c1841-ipbasek9-mz.124-12.bin                16599160
 4  : c2600-advipservicesk9-mz.124-15.T1.bin      33591768
 5  : c2600-i-mz.122-28.bin                       5571584
 6  : c2600-ipbasek9-mz.124-8.bin                 13169700
 7  : c2800nm-advipservicesk9-mz.124-15.T1.bin     50938004
 8  : c2800nm-advipservicesk9-mz.151-4.M4.bin      33591768
 9  : c2800nm-ipbase-mz.123-14.T7.bin             5571584
10  : c2800nm-ipbasek9-mz.124-8.bin               15522644
11  : c2950-i6q412-mz.121-22.EA4.bin             3058048
12  : c2950-i6q412-mz.121-22.EA8.bin             3117390
13  : c2960-lanbase-mz.122-25.FX.bin             4414921
14  : c2960-lanbase-mz.122-25.SEE1.bin           4670455
15  : c2960-lanbasek9-mz.150-2.SE4.bin            4670455
16  : c3560-advipservicesk9-mz.122-37.SE1.bin     8662192
17  : m2.txt                                       15
18  : pt1000-i-mz.122-28.bin                     5571584
19  : pt3000-i6q412-mz.121-22.EA4.bin            3117390
ftp>
```

- Selected a pc and accessed the file made through the commands below.



FINAL NETWORK:



Constrains

Hardware and resources:

There are only a few virtual devices available in Cisco Packet Tracer, so we had to make some adjustments to the variety and amount of devices we employed in our network design. It can be resource-intensive to run several services, such as DHCP, DNS, and a web server, on the same machine. Because of this, we needed to improve our network design to make sure that each device has the resources to operate its service.

Configurations:

It was difficult to set up VLANs and make sure they function effectively, especially if when we had many VLANs for various departments. As a result, we had to carefully plan and build your VLANs, as well as make sure they are tested and correctly set.

Security:

When constructing a network, we had to take security concerns into account. To make sure that only authorized users may access the network and its services, we needed to configure firewalls and access control lists (ACLs).

Interoperability:

We had to make sure that all our network's hardware and software are compatible and able to connect with one another. For instance, we needed to set up DNS servers to help the web server resolve domain names and make sure VLANs can interact with one another as necessary.

All things considered, creating and executing a network with DHCP, DNS, a web server, and VLANs was difficult, but by careful planning, testing, and optimization we ensured a successful implementation.

