INTERNETWORKING ESSENTIALS- CSE307

Section – K23UP

Submitted by:

Prabhu Pritam

Registration & Roll Number:

12302414, 57

CA - 2

In partial fulfilment for the requirements of the award of the degree of

"B. Tech CSE Data Science and Machine Learning"

"School of Computer Science and Engineering"

Lovely Professional University

Phagwara, Punjab

GITHUB LINK: - https://github.com/LEOPRITAM01/CSE307-CA02

Project57: You are hired as a network engineer for **A2Z Solutions**, a midsized enterprise with a **5-floor** office building. Each floor is equipped with **a different number of computers, like floor 1 has 7485, floor 2 has 34537, floor 3 has 2395, floor 4 has 334, and floor 5 has 222.** Configure the **DHCP** server on floor 1, the **Email** server should be connected on floor 3, the **HTTP** server should be connected on floor 2, and the **DNS** and **FTP** servers of the company are on floor 5. The organization requires a well-structured network to ensure efficient communication and scalability.

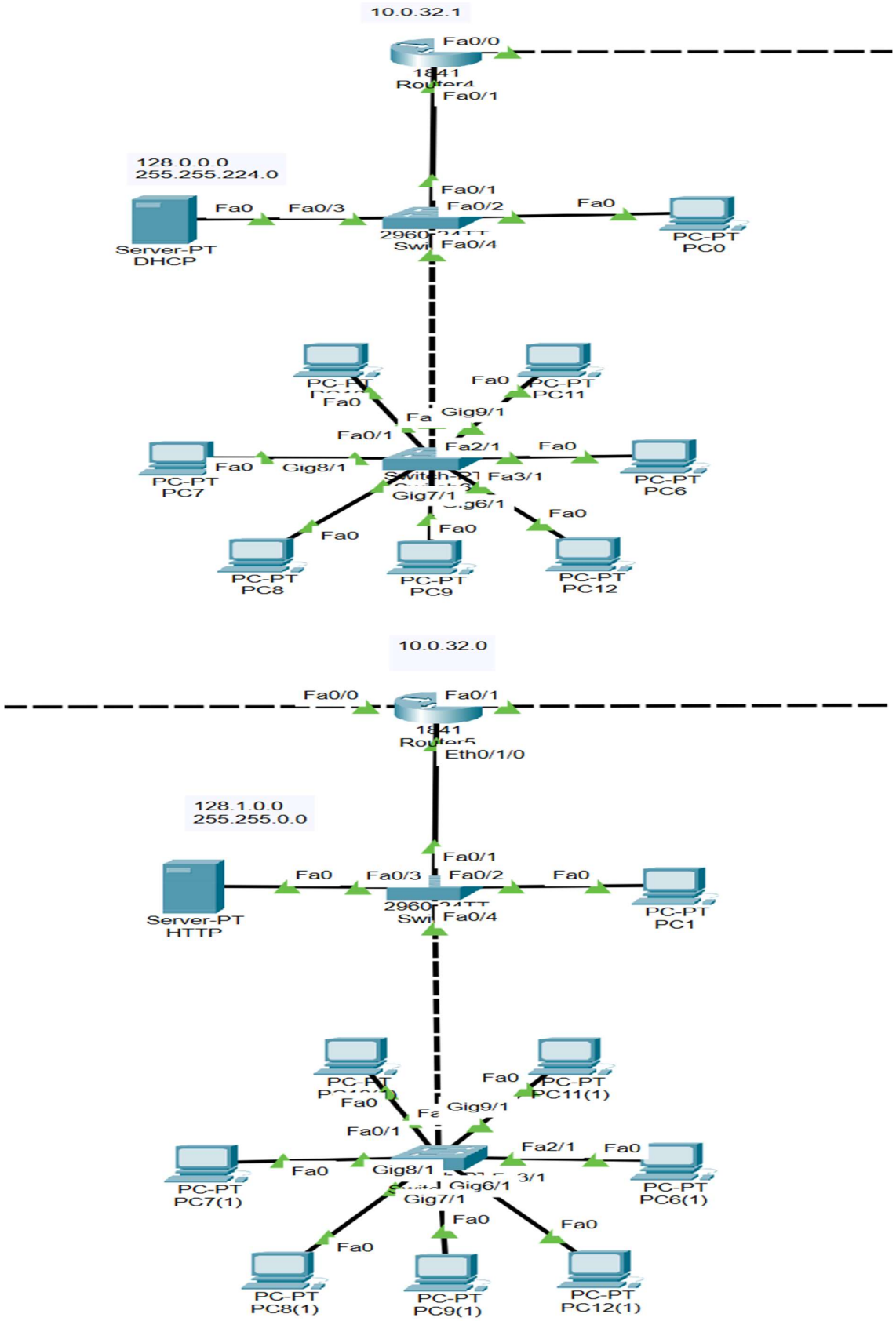
Network Design Requirements:

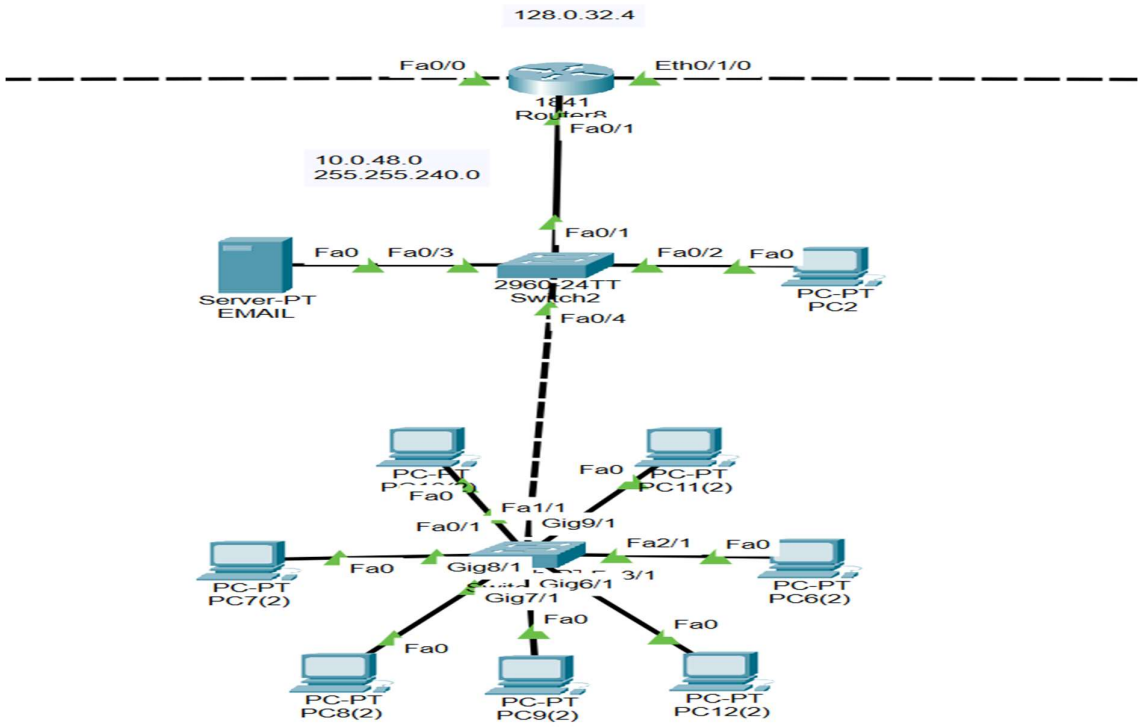
1. **Topology Selection:** Design a **Star topology** for the first **4** floors and a **Mesh topology** for the **remaining** floors, considering performance and fault tolerance. (Just connect **7** computers on **each floor** instead of the given requirement, as we are not able to do this in Cisco Packet Tracer.)

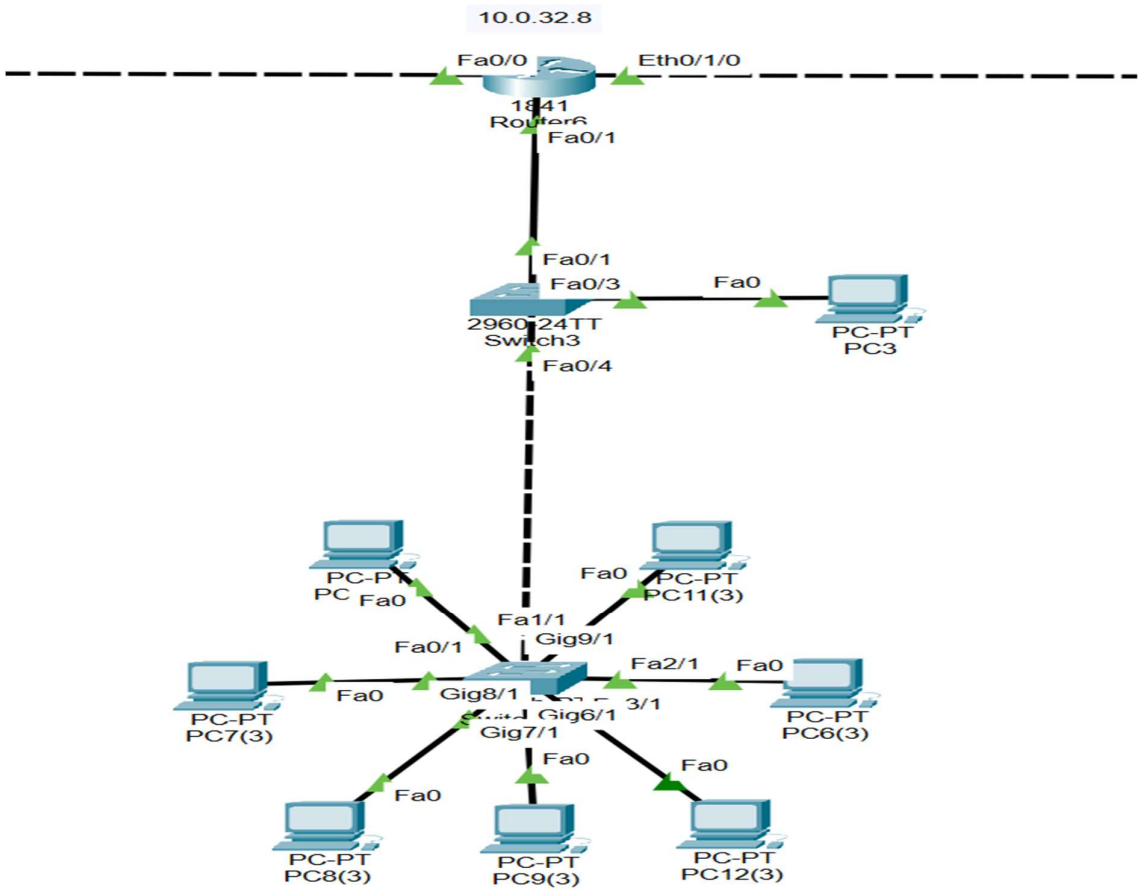
2. **IP Addressing Scheme:** The company has decided to use **Class B public IPv4 addresses** for the **first 2** floors and Class **A private** for the **remaining** floors, following a **classless addressing scheme that is VLSM.** Allocate IP addresses properly for each floor, ensuring uniqueness.

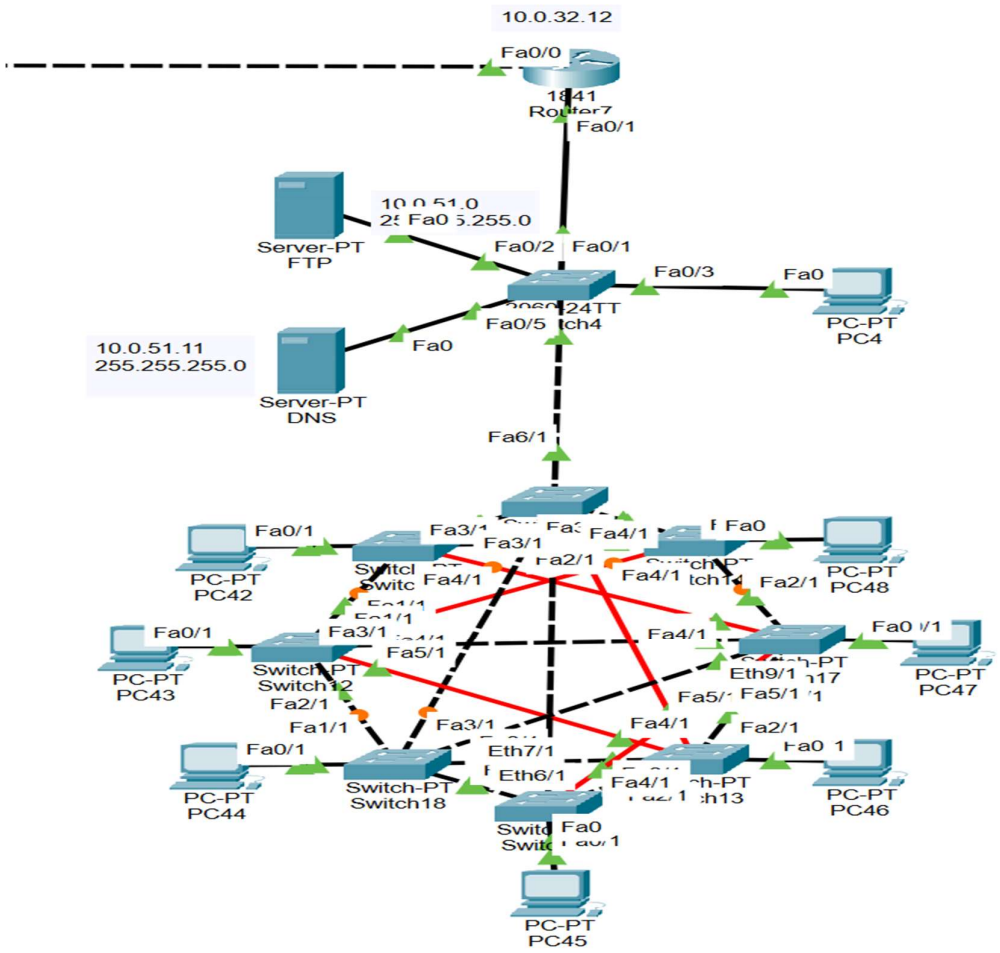
3. **Routing Strategy for Inter-Floor Communication & Connectivity:** Recommend a **routing approach** that is **Dynamic** for inter-floor communication.

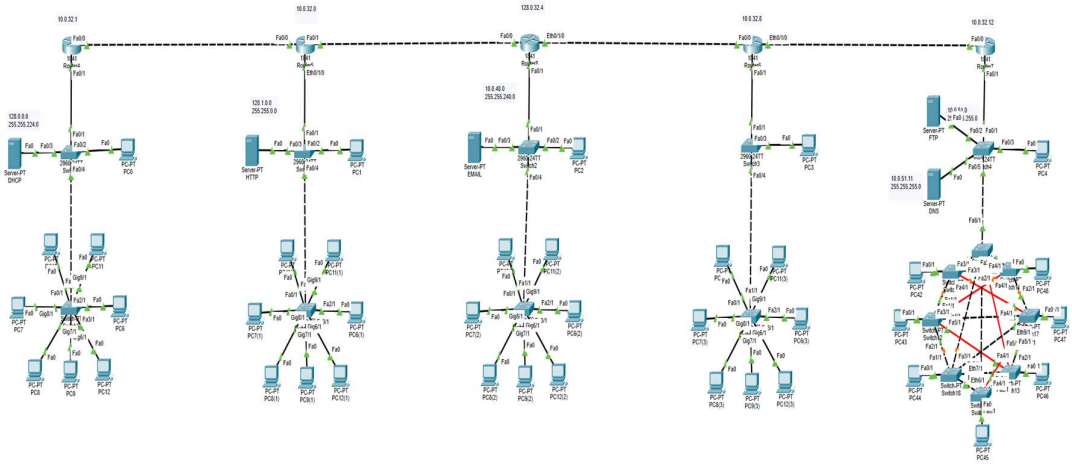
- Design how the floors will be connected for seamless interdepartmental communication.
- Suggest the appropriate network devices (e.g., switches, routers, access points) and their placement.
- If using dynamic routing, use RIP routing protocol.
- If using static routing, define the static routes for efficient data flow.
- The minimum number of routers to be used should be 4 and the maximum 5.
- Specify the number of default gateways along with IP addresses.
- Specify each SUBENTWORK with proper Subnetwork address, host IP range, and broadcast address.

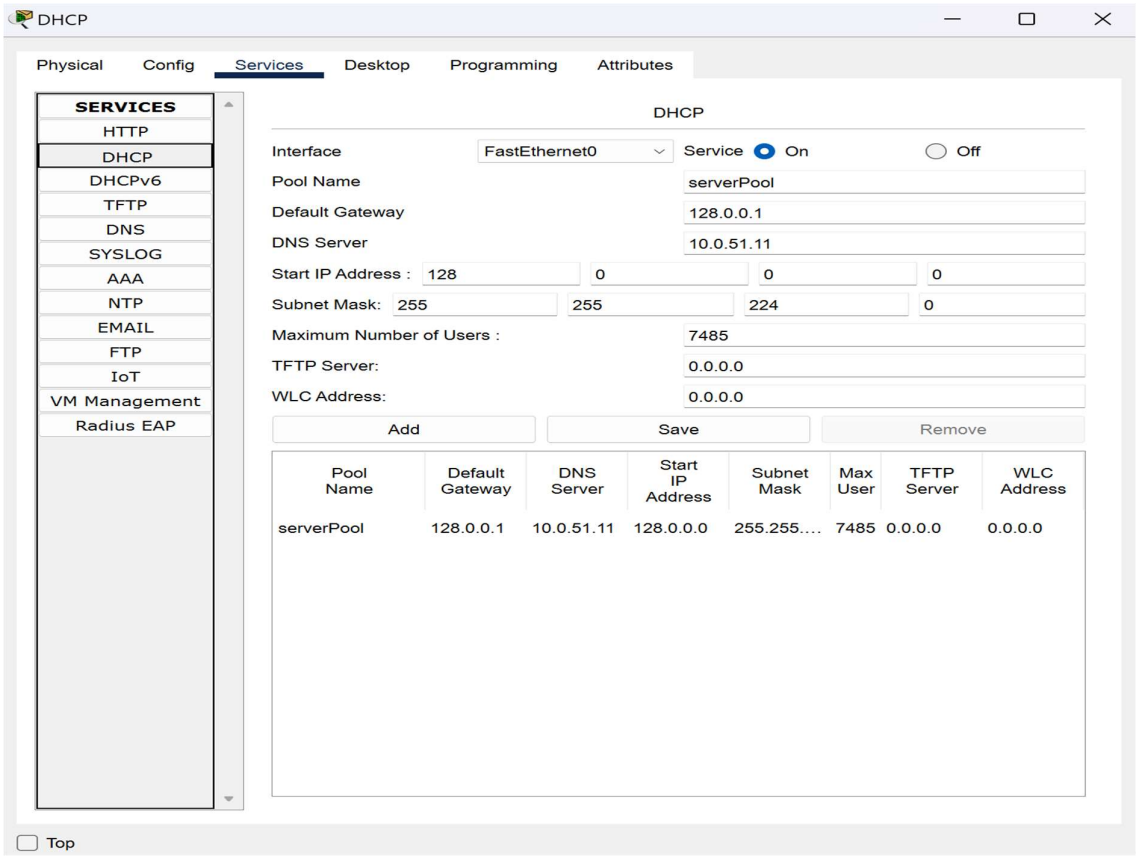

10.0.32.1
Fa0/0
1841
Router4
Fa0/1
128.0.0.0
255.255.224.0
Fa0/1
Fa0
Fa0/3
Fa0/2
Fa0
Server-PT
DHCP
2960
Swi
Fa0/4
PC-PT
PC0
PC-PT
Fa0
PC-PT
PC11
Fa0
Gig9/1
Fa0/1
Fa2/1
Fa0
PC-PT
PC7
Fa0
Gig8/1
Fa3/1
PC-PT
PC6
Gig7/1
Fa0
Fa0
Fa0
PC-PT
PC8
PC-PT
PC9
PC-PT
PC12
10.0.32.0
Fa0/0
Fa0/1
1841
Router5
Eth0/1/0
128.1.0.0
255.255.0.0
Fa0/1
Fa0
Fa0/3
Fa0/2
Fa0
Server-PT
HTTP
2960
Swi
Fa0/4
PC-PT
PC1
PC-PT
Fa0
PC-PT
PC11(1)
Fa0
Gig9/1
Fa0/1
Fa2/1
Fa0
PC-PT
PC7(1)
Fa0
Gig8/1
Gig6/1
Gig7/1
PC-PT
PC6(1)
Fa0
Fa0
Fa0
PC-PT
PC8(1)
PC-PT
PC9(1)
PC-PT
PC12(1)

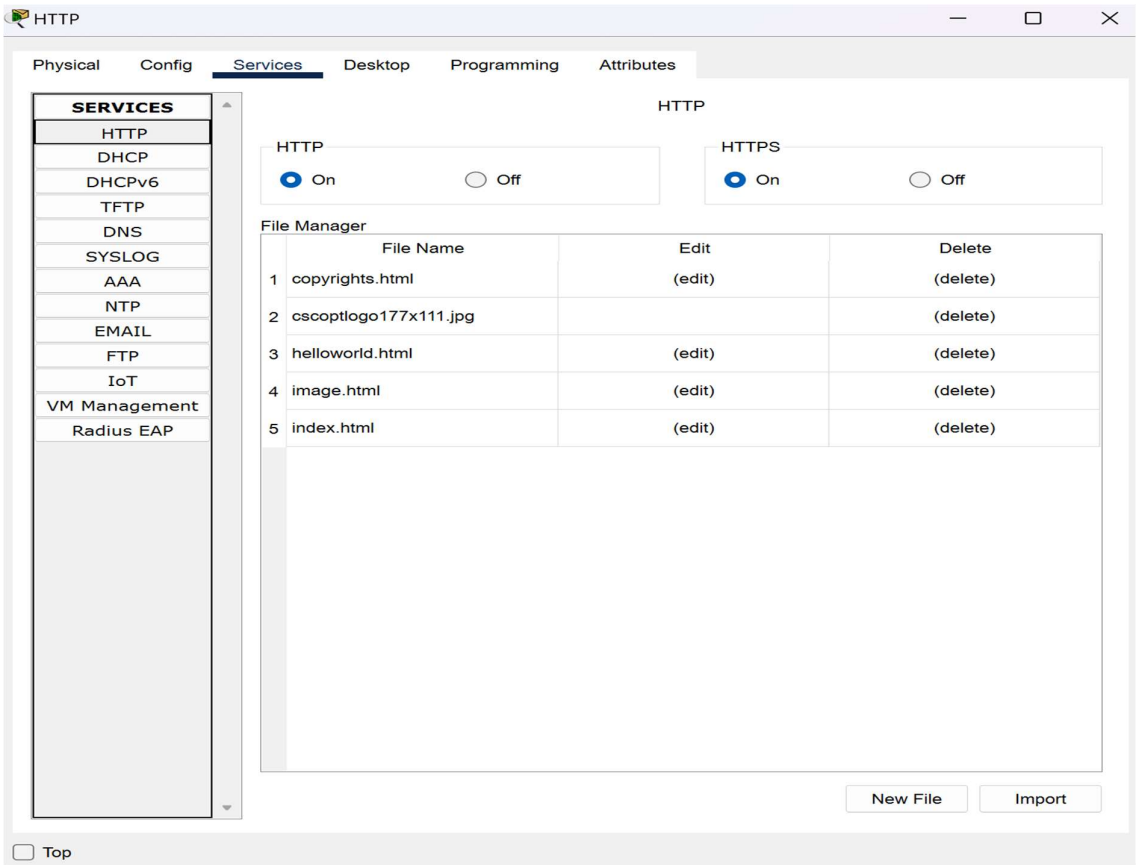

128.0.32.4
Fa0/0
Eth0/1/0
1841
Router8
Fa0/1
10.0.48.0
255.255.240.0
Fa0/1
Fa0
Fa0/3
Fa0/2
Fa0
Server-PT
EMAIL
2960-24TT
Switch2
PC-PT
PC2
Fa0/4
PC-PT
Fa0
Fa0
PC-PT
PC11(2)
Fa1/1
Gig9/1
Fa0/1
Fa2/1
Fa0
Fa0
PC-PT
PC7(2)
Gig8/1
Gig6/1
3/1
Gig7/1
PC-PT
PC6(2)
Fa0
Fa0
Fa0
PC-PT
PC8(2)
PC-PT
PC9(2)
PC-PT
PC12(2)

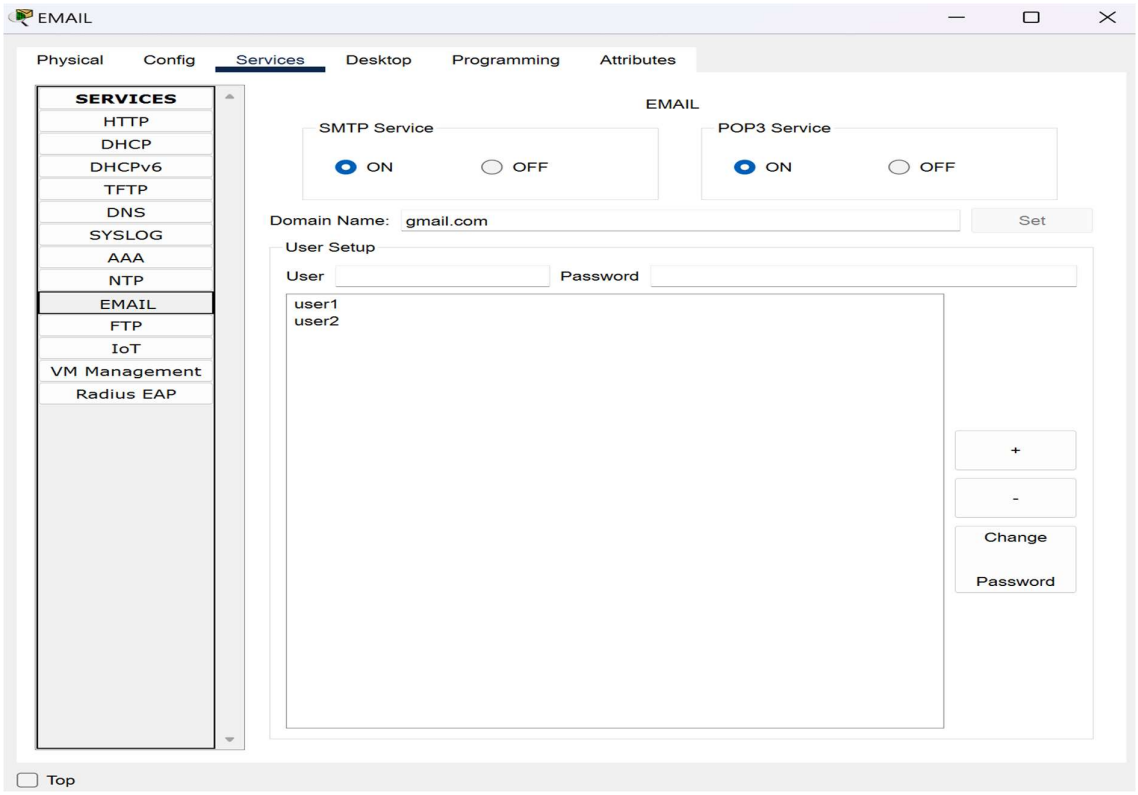

10.0.32.8
Fa0/0
Eth0/1/0
1841
Router6
Fa0/1
Fa0/1
Fa0/3
Fa0
2960-24TT
Switch3
PC-PT
PC3
Fa0/4
PC-PT
PC
Fa0
Fa0
PC-PT
PC11(3)
Fa1/1
Gig9/1
Fa0/1
Fa2/1
Fa0
Fa0
PC-PT
PC7(3)
Gig8/1
Gig6/1
3/1
Gig7/1
PC-PT
PC6(3)
Fa0
Fa0
Fa0
PC-PT
PC8(3)
PC-PT
PC9(3)
PC-PT
PC12(3)

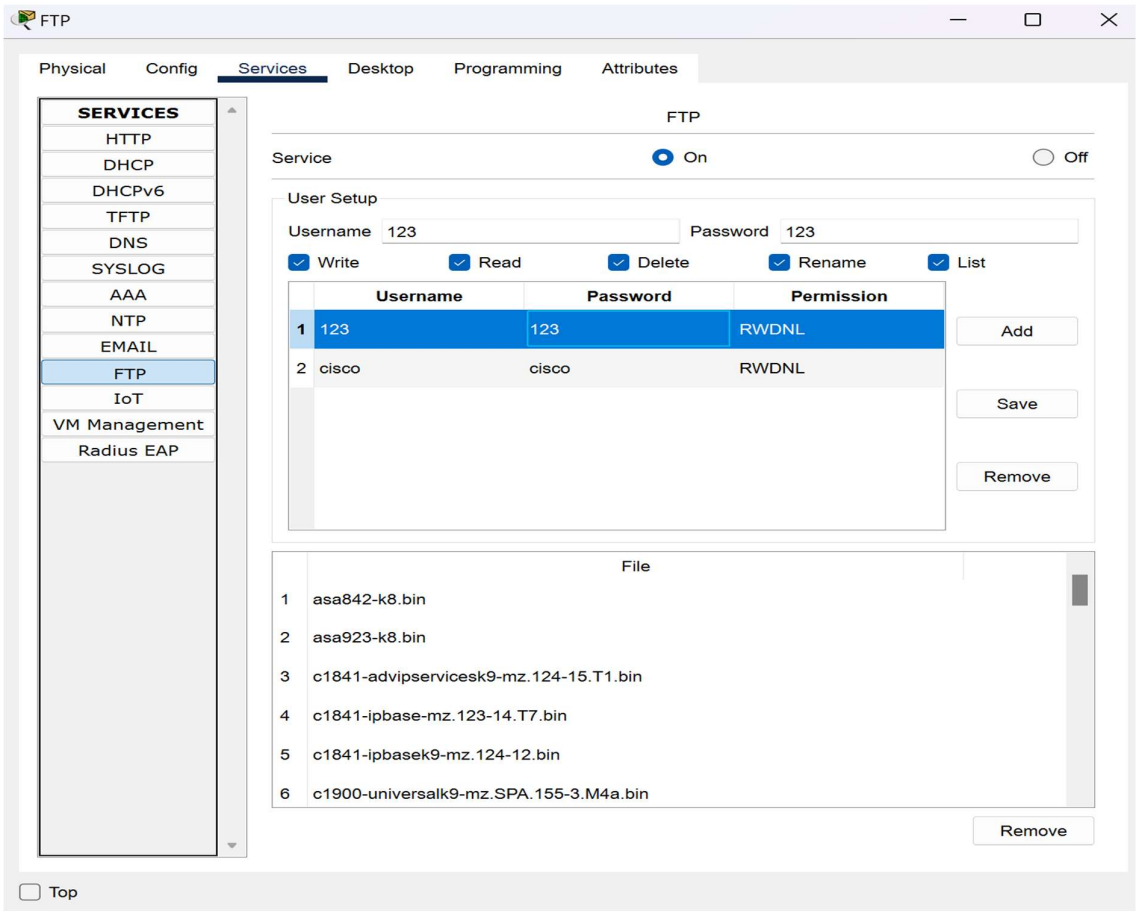

10.0.32.12
Fa0/0
Fa0/1
Server-PT
FTP
Fa0/2
Fa0/3
Fa0
PC-PT
PC4
Fa0/5
Fa0
10.0.51.11
255.255.255.0
Server-PT
DNS
Fa6/1
Fa0/1
PC-PT
PC42
Fa3/1
Fa4/1
Fa2/1
PC-PT
PC48
Fa0/1
PC-PT
PC43
Fa5/1
Switch12
Fa2/1
Fa1/1
Eth9/1
PC-PT
PC47
Fa0/1
PC-PT
PC44
Switch-PT
Switch18
Eth7/1
Eth6/1
Fa0
PC-PT
PC46
PC-PT
PC45

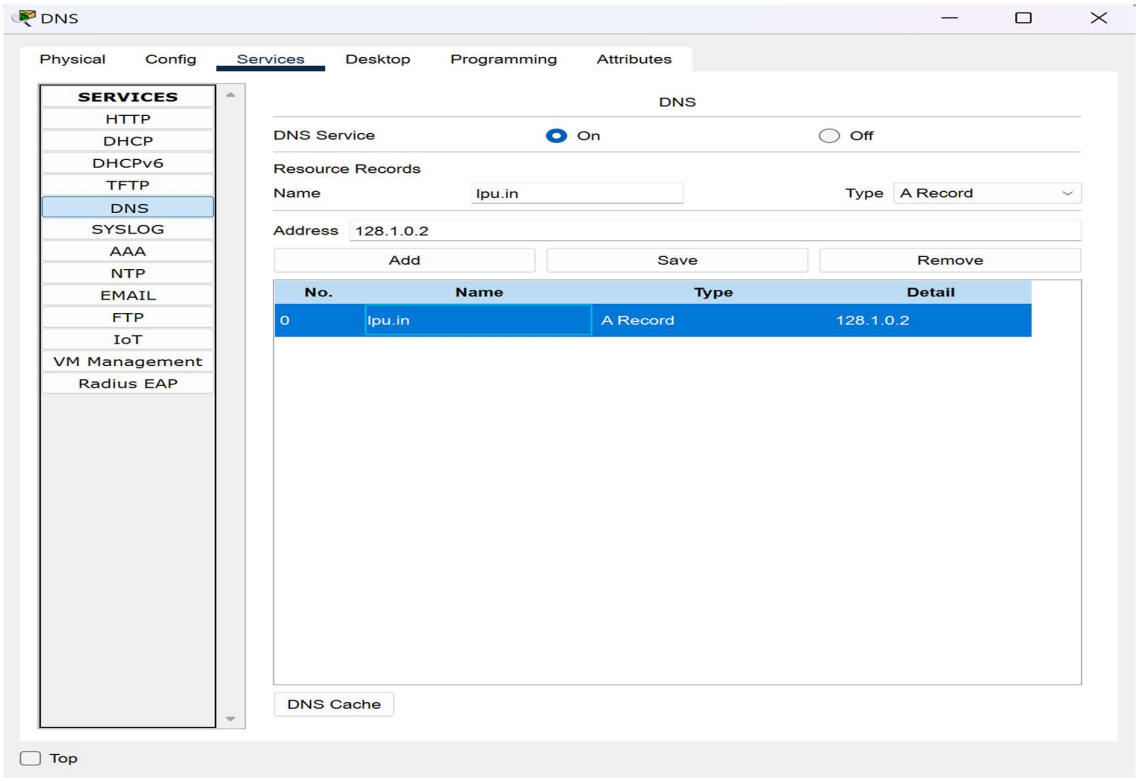



DHCP
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DHCP
Interface
FastEthernet0
Service
On
Off
Pool Name
serverPool
Default Gateway
128.0.0.1
DNS Server
10.0.51.11
Start IP Address :
128
0
0
0
Subnet Mask:
255
255
224
0
Maximum Number of Users :
7485
TFTP Server:
0.0.0.0
WLC Address:
0.0.0.0
Add
Save
Remove
Pool Name
Default Gateway
DNS Server
Start IP Address
Subnet Mask
Max User
TFTP Server
WLC Address
serverPool
128.0.0.1
10.0.51.11
128.0.0.0
255.255....
7485
0.0.0.0
0.0.0.0
Top


HTTP
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
HTTP
HTTP
On
Off
HTTPS
On
Off
File Manager
File Name
Edit
Delete
1 copyrights.html (edit) (delete)
2 cscoptlogo177x111.jpg (delete)
3 helloworld.html (edit) (delete)
4 image.html (edit) (delete)
5 index.html (edit) (delete)
New File
Import
Top


EMAIL
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
EMAIL
SMTP Service
ON
OFF
POP3 Service
ON
OFF
Domain Name:
gmail.com
Set
User Setup
User
Password
user1
user2
+
-
Change
Password
Top


FTP
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
FTP
Service
On
Off
User Setup
Username
123
Password
123
Write
Read
Delete
Rename
List
Username
Password
Permission
1
123
123
RWDNL
2
cisco
cisco
RWDNL
Add
Save
Remove
File
1
asa842-k8.bin
2
asa923-k8.bin
3
c1841-advipservicesk9-mz.124-15.T1.bin
4
c1841-ipbase-mz.123-14.T7.bin
5
c1841-ipbasek9-mz.124-12.bin
6
c1900-universalk9-mz.SPA.155-3.M4a.bin
Remove
Top


DNS
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DNS
DNS Service
On
Off
Resource Records
Name
lpu.in
Type
A Record
Address
128.1.0.2
Add
Save
Remove
No.
Name
Type
Detail
0
lpu.in
A Record
128.1.0.2
DNS Cache
Top