COLLAGE NETWORK DESIGN

COURT ROAD NETWORKZ SYSTEMS
NAGERCOIL, KANYAKUMARI

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COURSE NAME : CCNA
DATE : 7-12-2022

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Abstract

The Primary purpose of a computer network is to share resources. A computer network is referred to as client/server if (at least) one of the computers is used to server other computer referred to as client. Beside the computers,other types of devices can be part of the network. In the early day of networking there will be once central server that contains the data and all the clients can access this data through a Network Interface card. Later on client server architecture came into existence, where still burden is there on the server machine. To avoid the disadvantages in distributed computing was introduced which reduce the burden on the server by providing work sharing capabilities. This paper describes how the concept of distributed computing came into existence based on the advantages and disadvantages that raised in earlier networking concepts. The concepts of distributed computing speaks that once data is available within the server (s), it should be able to be accessed and processed from any kind of client device like computer, computer, mobile phone, PDA, etc.

ACKNOWLEDGMENT

First we would like to thank the Almighty for his wonderful presence with us throughtout the

completion of the project and making it as a successful one.

We are expressing our deep gratitude to COURT ROAD NETWORKZ SYSTEMS INSTITUTION which provided us an opportunity in fulfilling our most cherished desire in reaching our goal.

This is a great pleasure to express our deep sense of gratitude and thanks to our guide MISS ANTONET REETA for her valuable ideas, instantaneous help, effective support and continued encouragement which enabled for the successful completion of the project

We gratefully remember the available suggestion of our respective staff for their valuable and timely guidance for the completion of the project.

We gratefully remember the available suggestion of our respective staff for their valuable and timely guidance for the completion of this project. Finally we would like to express our sincere thanks to all our friends who gave good ideas not suggestions for our project.

INTRODUCTION

Networking is referred as connecting computers electrically for the purpose of sharing information. Resources such as a file, application,

printer & software. The advantage of networking can be seen in the terms of security, efficiency, manageablility and cost as it allows collaboration between user in a wide range. The switches and router this device that play and important role in data transfer from one place to another using different technology such ad radio waves & wire.

Networking Requirement

1. The active networking components (Routers, Switches, Wireless access points etc) with quantity.
2. The IP network design for each department.
3. Dynamic IP addressing design for all networks
4. Identify the configuration and features, wherever appropriate, which is required on the active components to setup the network.
5. Analysis, identification and explantion of methodologies to use for access restriction and internet sharing.
6. Creating and mapping IP networks with vlans.

HARDWARE REQUIREMENT

- Processor AMD PRO A4-4350B R4,5 COMPUTE CORES 2C
  +3G 2.50GHz

- RAM 4.00 GB
- System Type 64-bit operating system

REQUIREMENT

1. The following use cisco packet tracer to design and implement the network solution 2. Use RIP as the routing protocol 3. Configure SSH in principal room and telnet in staff room
4. Principal room, Staff room, Computer lab 1 and computer lab 2 required to have a wireless network for the users
5. Datascience and Multimedia should be in a different vlan 6. Class C type IP address used in every department
7. Device in Datascience and Multimedia are required to communicate with each other with the respective switch configured for intervlan routing
8. Devices in computer lab 5 are allocated IP address statically 9. Devices except computer lab 5 are allocated IP address dynamically 10. Test communication ensure everything configured is working as expected

SOFTWARE REQUIREMENT

- CISCO Packet Tracer

ROUTER CONFIGURATION

ROUTER 1

```
hostname r1
aaa new-model
aaa authentication login default group tacacs+ local
aaa authentication enable default group tacacs+ local
no ip cef
no ipv6 cef
username aakash password 0 1234
license udi pid CISCO1941/K9 sn FTX1524Z4DO-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 1.0.0.1 255.0.0.0
duplex auto
speed auto
interface GigabitEthernet0/1
ip address 2.0.0.1 255.0.0.0
duplex auto
speed auto
interface Serial0/1/0
ip address 10.0.0.1 255.0.0.0
clock rate 2000000
interface Serial0/1/1
ip address 20.0.0.1 255.0.0.0
clock rate 2000000
interface Vlan1
no ip address
shutdown
router eigrp 1
network 10.0.0.0
network 1.0.0.0
network 2.0.0.0
network 20.0.0.0
ip classless
ip flow-export version 9
tacacs-server host 100.0.0.1
tacacs-server key cisco
line con 0
line aux 0
line vty 0 4
end
```

ROUTER 2

```
hostname r2
!
```

```
aaa new-model!
aaa authentication login default group tacacs+ local
aaa authentication enable default group tacacs+ local
no ip cef
no ipv6 cef
username aakash password 0 1234
license udi pid CISCO1941/K9 sn FTX1524B71Y-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 3.0.0.1 255.0.0.0
duplex auto
speed auto
interface GigabitEthernet0/1
ip address 4.0.0.1 255.0.0.0
duplex auto
speed auto
interface Serial0/1/0
ip address 20.0.0.2 255.0.0.0
interface Serial0/1/1
ip address 30.0.0.1 255.0.0.0
clock rate 2000000
interface Vlan1
no ip address
shutdown
router eigrp 1
network 3.0.0.0
network 4.0.0.0
network 20.0.0.0
network 30.0.0.0
ip classless
ip flow-export version 9
tacacs-server host 102.0.0.1
tacacs-server key cisco
line con 0
line aux 0
line vty 0 4
End
```

Router 3

```
hostname Router
no ip cef
no ipv6 cef
license udi pid CISCO1941/K9 sn FTX1524ELY5-!
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 7.0.0.1 255.0.0.0
duplex auto
speed auto
interface GigabitEthernet0/1
```

```
ip address 8.0.0.1 255.0.0.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 19.0.0.2 255.0.0.0
clock rate 2000000
!
interface Serial0/0/1
no ip address
clock rate 2000000
!
interface Serial0/1/0
ip address 30.0.0.2 255.0.0.0
!
interface Serial0/1/1
ip address 40.0.0.2 255.0.0.0
clock rate 2000000
!
interface Vlan1
no ip address
shutdown
!
ip classless
!
ip flow-export version 9
!
!
!
!
tacacs-server key cisco
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
End
```

ROUTER 4

```
hostname r4
!
```

```
aaa new-model
!
aaa authentication login default group tacacs+ local
aaa authentication enable default group tacacs+ local
no ip cef
no ipv6 cef
!
!
!
username aakash password 0 1234
!
!
license udi pid CISCO1941/K9 sn FTX15241ZSQ-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 5.0.0.1 255.0.0.0
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 6.0.0.1 255.0.0.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 19.0.0.2 255.0.0.0
clock rate 2000000
!
interface Serial0/0/1
no ip address
clock rate 2000000
!
interface Serial0/1/0
ip address 10.0.0.2 255.0.0.0
!
interface Serial0/1/1
ip address 40.0.0.1 255.0.0.0
!
interface Vlan1
no ip address
shutdown
!
router eigrp 1
network 5.0.0.0
network 6.0.0.0
network 10.0.0.0
network 40.0.0.0
!
ip classless
!
```

```
ip flow-export version 9
!
!
!
!
tacacs-server host 101.0.0.2
tacacs-server key cisco
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
!
!
!
End
```

ROUTER 5

```
hostname Router
ip dhcp pool aaa
network 80.0.0.0 255.0.0.0
default-router 80.0.0.1
option 150 ip 80.0.0.1
!
!
!
ip cef
no ipv6 cef
!
!
license udi pid CISCO2811/K9 sn FTX1017F19X-
!
spanning-tree mode pvst
interface FastEthernet0/0
ip address 80.0.0.1 255.0.0.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
```

```
no ip address
shutdown
!
ip classless
!
ip flow-export version 9
telephony-service
max-ephones 5
max-dn 5
ip source-address 80.0.0.1 port 2000
auto assign 1 to 5
!
ephone-dn 1
number 1111
!
ephone-dn 2
number 2222
!
ephone-dn 3
number 3333
!
ephone-dn 4
number 4444
!
ephone 1
device-security-mode none
mac-address 00D0.FF68.3D04
type 7960
button 1:2
!
ephone 2
device-security-mode none
mac-address 000A.414E.5613
type 7960
button 1:1
!
ephone 3
device-security-mode none
mac-address 00D0.5809.4773
type 7960
button 1:4
!
ephone 4
device-security-mode none
mac-address 0001.423B.7757
type 7960
button 1:3
!
line con 0
!
```

```
line aux 0
!
line vty 0 4
login
!
!
!
end
```

ROUTER 6

```
hostname Router
!
!
aaa new-model
!
aaa authentication login default group tacacs+ local
aaa authentication enable default group tacacs+ local
!
no ip cef
no ipv6 cef
!
!
!
username aakash password 0 1234
!
!
license udi pid CISCO1941/K9 sn FTX15248807-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 11.0.0.1 255.0.0.0
duplex auto
speed auto
!
interface GigabitEthernet0/0.23
encapsulation dot1Q 23
ip address 23.0.0.1 255.0.0.0
!
interface GigabitEthernet0/0.24
encapsulation dot1Q 24
ip address 24.0.0.1 255.0.0.0
!
interface GigabitEthernet0/1
ip address 22.0.0.1 255.0.0.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 19.0.0.1 255.0.0.0
```

```
clock rate 2000000
!
interface Serial0/0/1
no ip address
clock rate 2000000
!
interface Serial0/1/0
ip address 14.0.0.1 255.0.0.0
clock rate 2000000
!
interface Serial0/1/1
ip address 16.0.0.1 255.0.0.0
clock rate 2000000
!
interface Vlan1
no ip address
shutdown
!
router eigrp 1
network 11.0.0.0
network 19.0.0.0
network 14.0.0.0
network 16.0.0.0
!
router rip
network 11.0.0.0
network 14.0.0.0
network 16.0.0.0
network 22.0.0.0
!
ip classless
!
ip flow-export version 9
!
!
!
!
tacacs-server host 101.0.0.2
tacacs-server key cisco
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
!
!
```

```
!
End
```

SWITCH CONFIGURATION

The following configuration details the actual setup to performed on a CISCO switch.

Create VLAN’ s, VLAN 10 and VLAN 20 with respective names on switch.

Switch 1

```
hostname Switch
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport mode trunk
!
interface FastEthernet0/2
switchport mode trunk
!
interface FastEthernet0/3
switchport access vlan 24
!
interface FastEthernet0/4
switchport access vlan 24
!
interface FastEthernet0/5
switchport access vlan 24
!
interface FastEthernet0/6
switchport access vlan 24
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
```

```
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
```

End

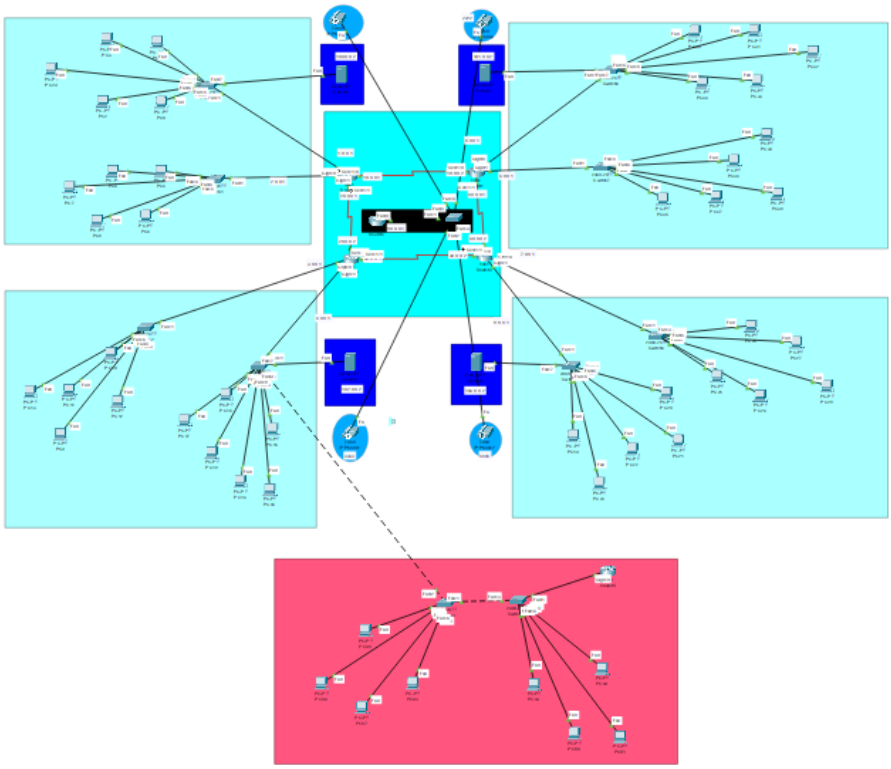
SWITCH 2

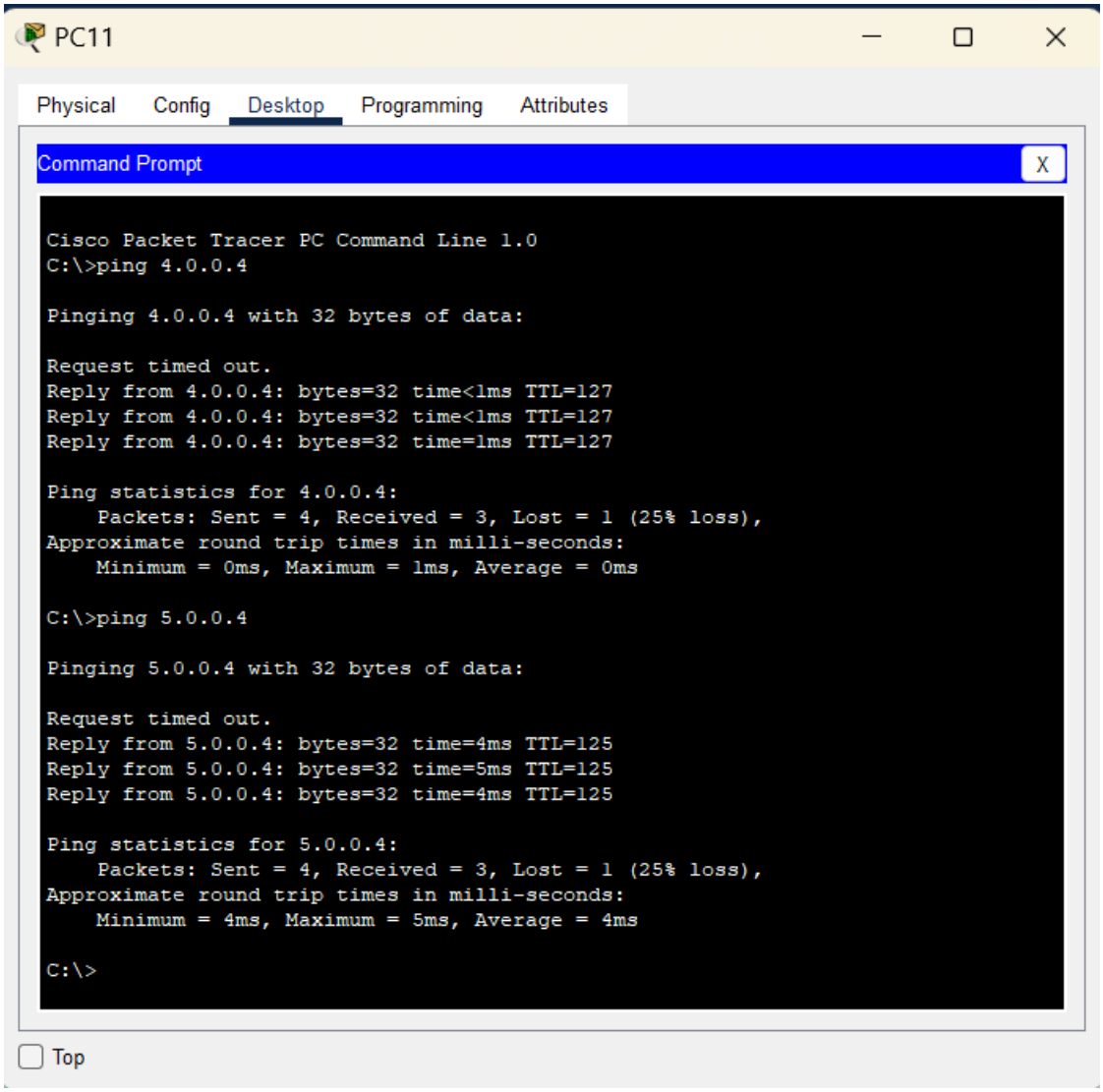
```
hostname Switch
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport mode trunk
!
interface FastEthernet0/2
switchport access vlan 23
!
interface FastEthernet0/3
switchport mode trunk
!
interface FastEthernet0/4
switchport access vlan 23
!
interface FastEthernet0/5
switchport access vlan 23
!
interface FastEthernet0/6
switchport access vlan 23
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
```

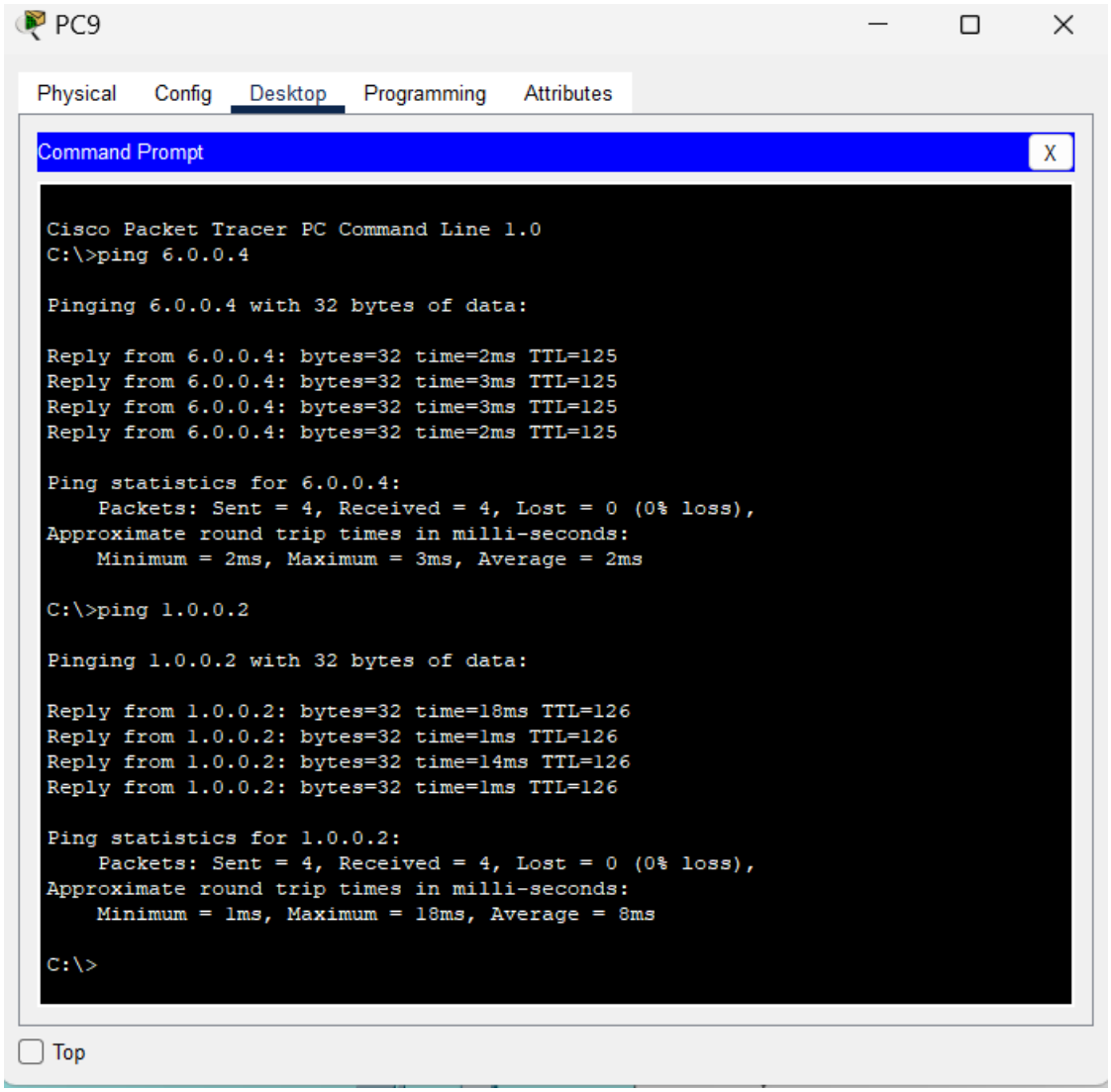
```
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
End

if-range)#exit
```

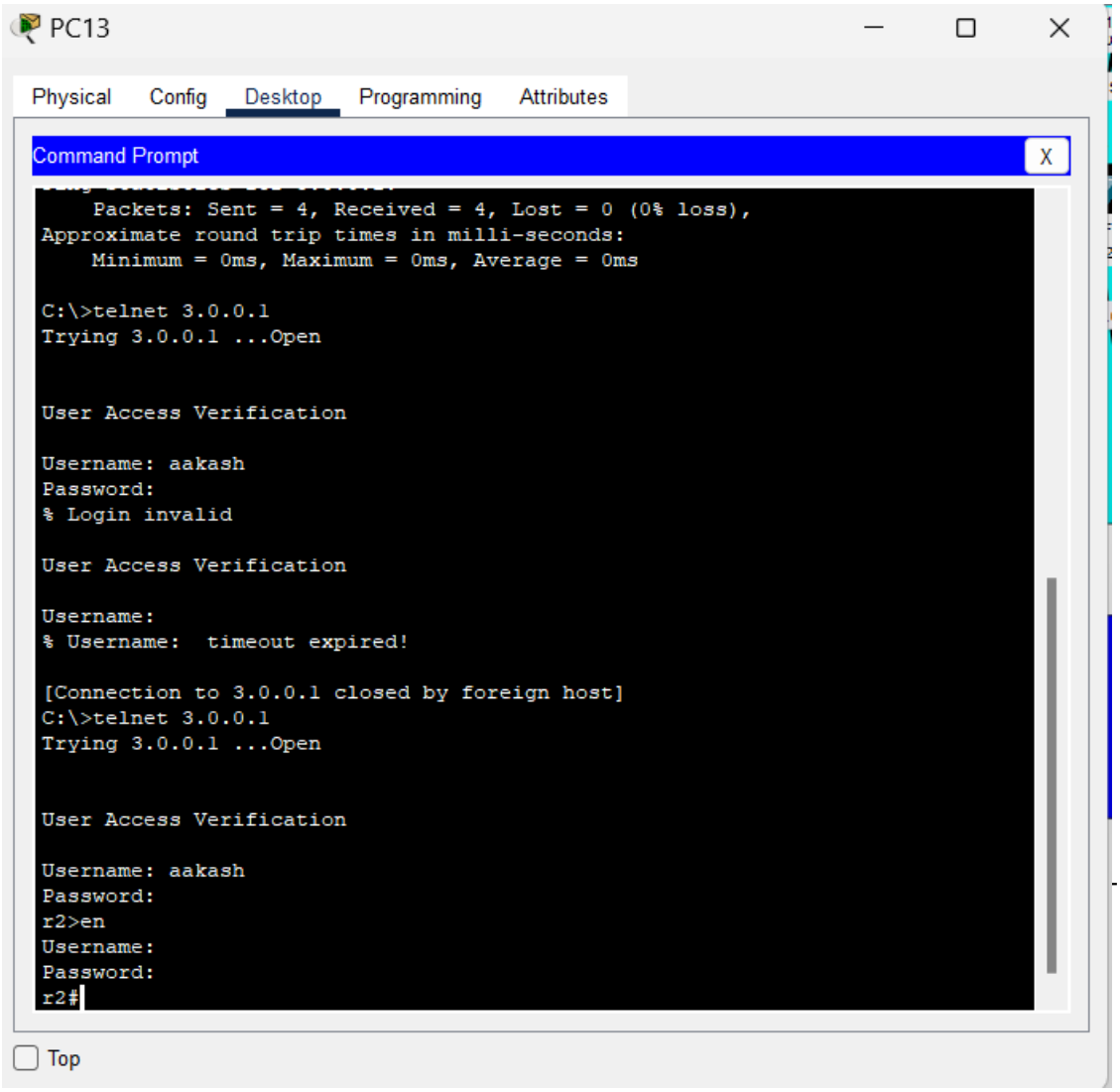
NETWORK TOPOLOGY

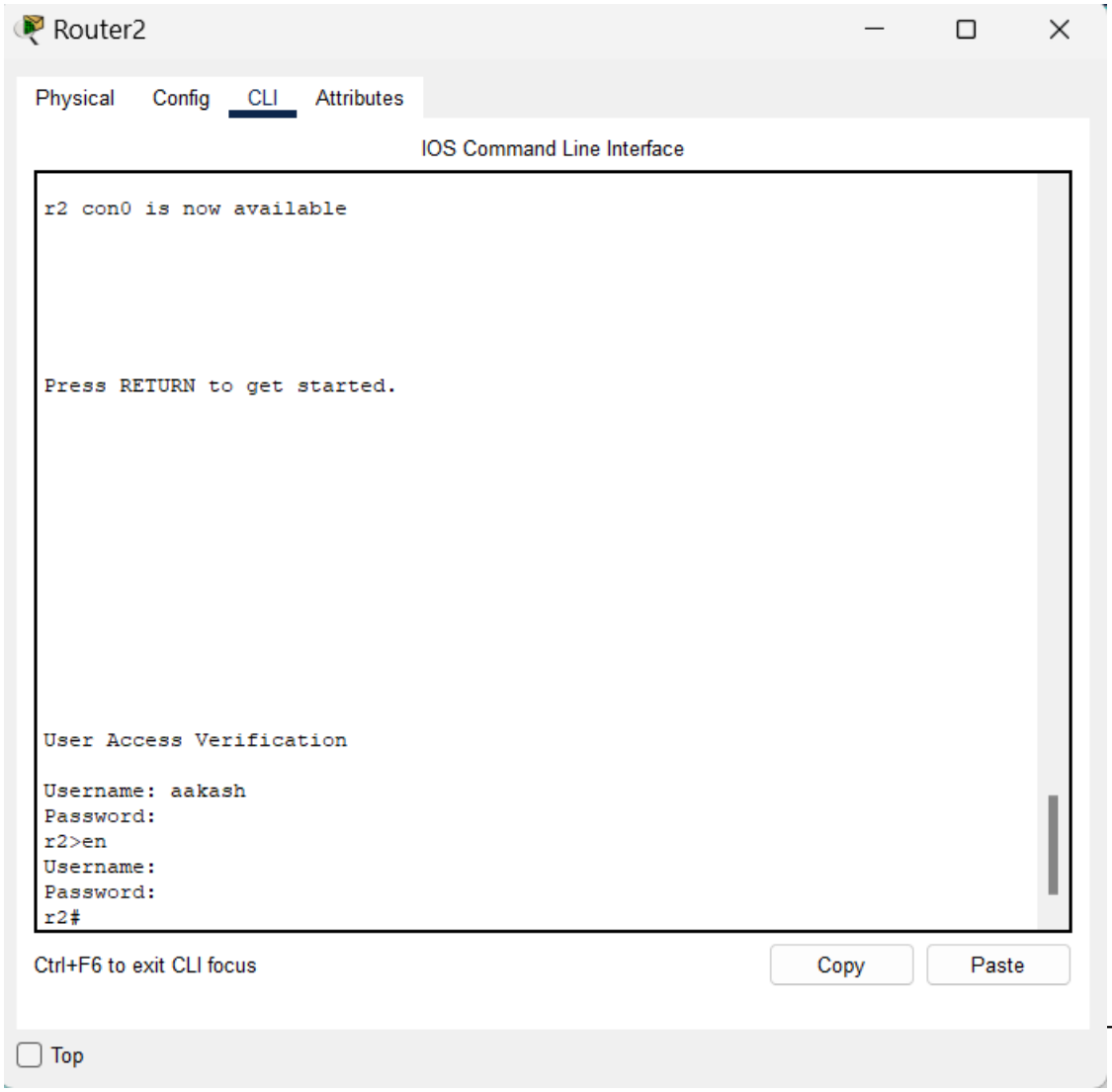


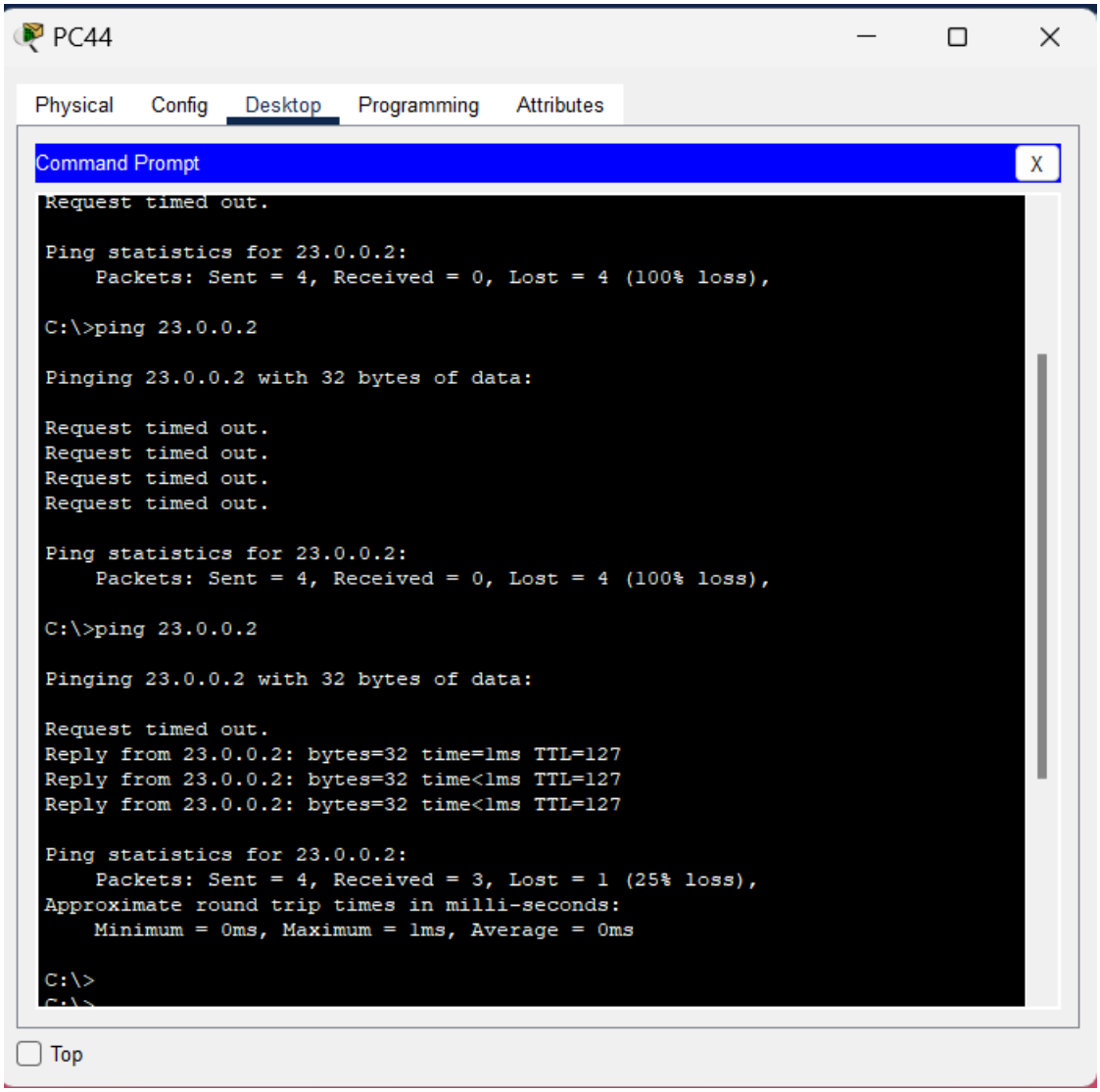

PC11
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 4.0.0.4
Pinging 4.0.0.4 with 32 bytes of data:
Request timed out.
Reply from 4.0.0.4: bytes=32 time<1ms TTL=127
Reply from 4.0.0.4: bytes=32 time<1ms TTL=127
Reply from 4.0.0.4: bytes=32 time=1ms TTL=127
Ping statistics for 4.0.0.4:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 5.0.0.4
Pinging 5.0.0.4 with 32 bytes of data:
Request timed out.
Reply from 5.0.0.4: bytes=32 time=4ms TTL=125
Reply from 5.0.0.4: bytes=32 time=5ms TTL=125
Reply from 5.0.0.4: bytes=32 time=4ms TTL=125
Ping statistics for 5.0.0.4:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 4ms, Maximum = 5ms, Average = 4ms
C:\>
Top


PC9
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 6.0.0.4
Pinging 6.0.0.4 with 32 bytes of data:
Reply from 6.0.0.4: bytes=32 time=2ms TTL=125
Reply from 6.0.0.4: bytes=32 time=3ms TTL=125
Reply from 6.0.0.4: bytes=32 time=3ms TTL=125
Reply from 6.0.0.4: bytes=32 time=2ms TTL=125
Ping statistics for 6.0.0.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 3ms, Average = 2ms
C:\>ping 1.0.0.2
Pinging 1.0.0.2 with 32 bytes of data:
Reply from 1.0.0.2: bytes=32 time=18ms TTL=126
Reply from 1.0.0.2: bytes=32 time=1ms TTL=126
Reply from 1.0.0.2: bytes=32 time=14ms TTL=126
Reply from 1.0.0.2: bytes=32 time=1ms TTL=126
Ping statistics for 1.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 18ms, Average = 8ms
C:\>
Top

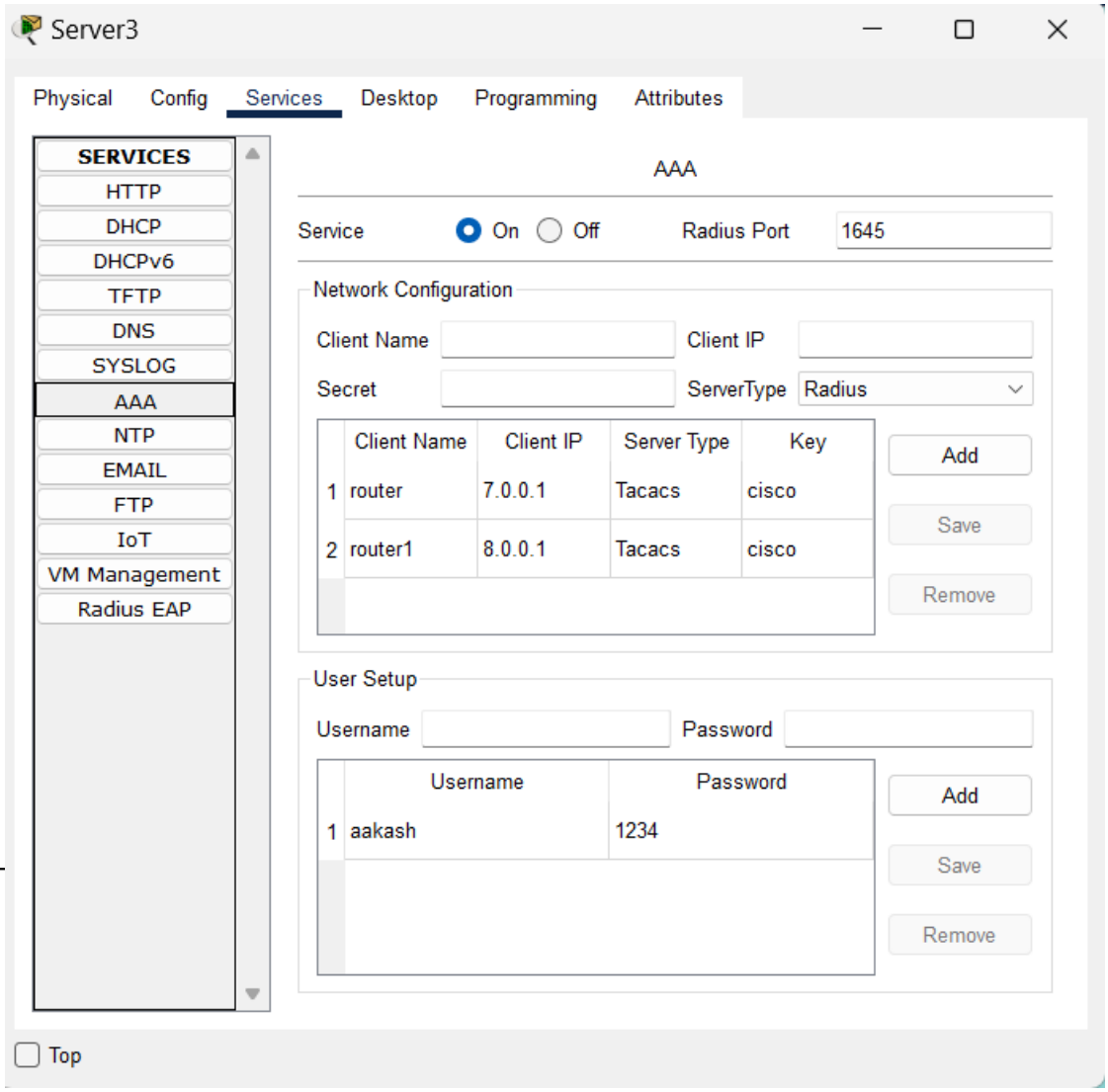
AAA

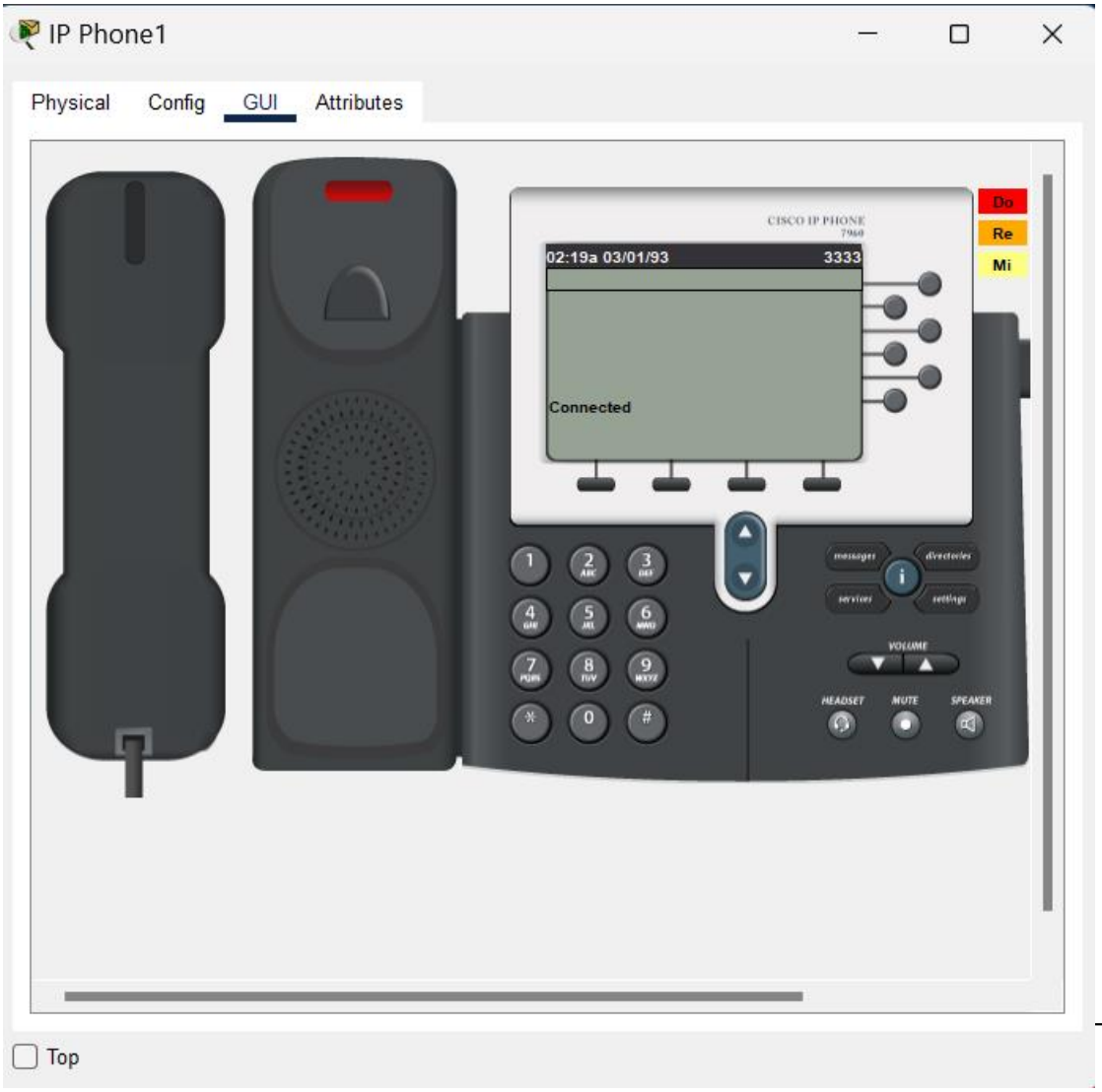

PC13
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>telnet 3.0.0.1
Trying 3.0.0.1 ...Open
User Access Verification
Username: aakash
Password:
% Login invalid
User Access Verification
Username:
% Username: timeout expired!
[Connection to 3.0.0.1 closed by foreign host]
C:\>telnet 3.0.0.1
Trying 3.0.0.1 ...Open
User Access Verification
Username: aakash
Password:
r2>en
Username:
Password:
r2#
Top

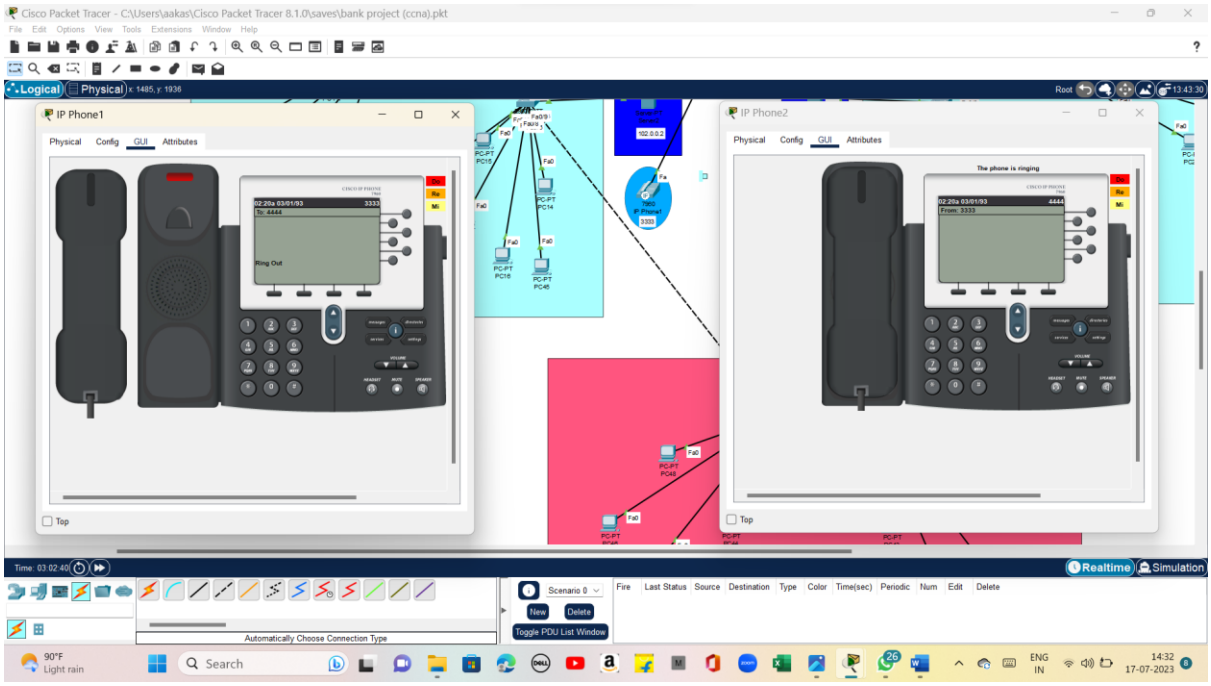

Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
r2 con0 is now available
Press RETURN to get started.
User Access Verification
Username: aakash
Password:
r2>en
Username:
Password:
r2#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

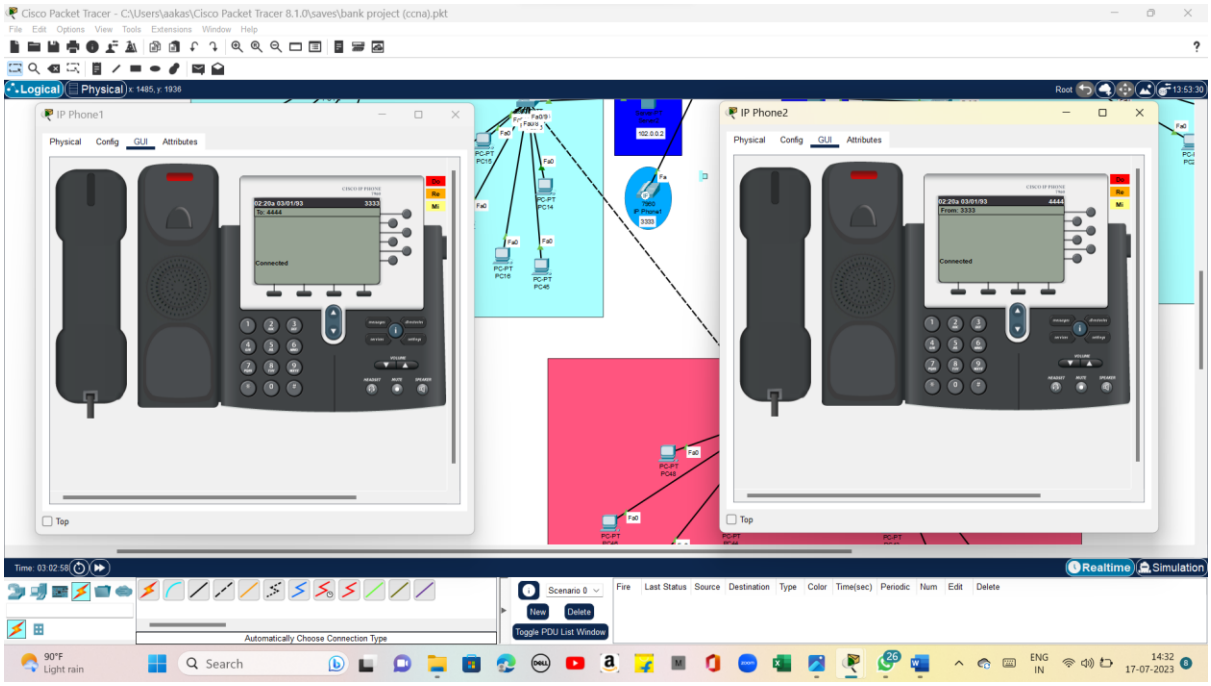

PC44
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Request timed out.
Ping statistics for 23.0.0.2:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 23.0.0.2
Pinging 23.0.0.2 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 23.0.0.2:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 23.0.0.2
Pinging 23.0.0.2 with 32 bytes of data:
Request timed out.
Reply from 23.0.0.2: bytes=32 time=1ms TTL=127
Reply from 23.0.0.2: bytes=32 time<1ms TTL=127
Reply from 23.0.0.2: bytes=32 time<1ms TTL=127
Ping statistics for 23.0.0.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>
Top

AAA IN SERVER




IP Phone1
Physical
Config
GUI
Attributes
CISCO IP PHONE
7960
02:19a 03/01/93
3333
Connected
Do
Re
Mi
messages
directories
services
settings
VOLUME
HEADSET
MUTE
SPEAKER
Top


Cisco Packet Tracer - C:\Users\aakas\Cisco Packet Tracer 8.1.0\saves\bank project (ccna).pkt
Logical
Physical
IP Phone1
Physical
Config
GUI
Attributes
Ring Out
IP Phone2
The phone is ringing
Top
Realtime
Simulation
Automatically Choose Connection Type
Toggle PDU List Window
90°F
Light rain
Search
ENG
IN
14:32
17-07-2023


Cisco Packet Tracer - C:\Users\aakas\Cisco Packet Tracer 8.1.0\saves\bank project (ccna).pkt
Logical
Physical
IP Phone1
Physical
Config
GUI
Attributes
IP Phone2
Physical
Config
GUI
Attributes
Top
Realtime
Simulation
Automatically Choose Connection Type
Toggle PDU List Window
90°F
Light rain
Search
ENG
IN
14:32
17-07-2023

SSPOINT

The whole network provide the convenient and secure way for the entire users of the bank and use better convenient way to access in order to get uninterrupted network, especially vlan & inter-vlan concept for the particular switches.