

COLLAGE NETWORK DESIGN



COURT ROAD NETWORKZ SYSTEMS
NAGERCOIL, KANYAKUMARI

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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

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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, manageability and cost as it allows collaboration between user in a wide range. The switches and router this device that play an important role in data transfer from one place to another using different technology such as radio waves & wire.

Networking Requirement

1. The active networking components (Routers (1941,2811),Switches, Ip telephone,pc, servers) 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 explanation of methodologies to use for access restriction and internet sharing.

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 EIGRP as the routing protocol
3. Configure AAA in principal room and telnet instaff room
4. Four building each building has four floors each floor has one ip telephone and five pc
5. There are four servers each servers connected to one building
6. Class A type IP address used in every department
7. Device in each building are required to communicate with each other

8. Test communication ensure everything configured is working as expected

SOFTWARE REQUIREMENT

- CISCO Packet Tracer

ROUTER CONFIGURATION

```
ROUTER 1
hostname building1
ip dhcp pool sec1
network 18.0.0.0 255.0.0.0
default-router 18.0.0.1
no ip cef
no ipv6 cef
license udi pid CISCO1941/K9 sn FTX152457YS-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 18.0.0.1 255.0.0.0
duplex auto
speed auto
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
interface Serial0/0/0
ip address 60.0.0.1 255.0.0.0
ip helper-address 20.0.0.2
ip helper-address 18.0.0.2
interface Serial0/0/1
ip address 50.0.0.1 255.0.0.0
clock rate 2000000
interface Serial0/1/0
ip address 10.0.0.1 255.0.0.0
interface Serial0/1/1
ip address 40.0.0.2 255.0.0.0
clock rate 2000000
interface Vlan1
no ip address
shutdown
router eigrp 1
network 10.0.0.0
network 40.0.0.0
network 50.0.0.0
```

```
network 60.0.0.0
ip classless
ip flow-export version 9
no cdp run
line con 0
line aux 0
line vty 0 4
login
end
```

ROUTER 2

```
hostname Router
ip dhcp excluded-address 1.0.0.4 1.0.0.8
ip dhcp excluded-address 2.0.0.4 2.0.0.8
ip dhcp pool floor1
network 1.0.0.0 255.0.0.0
default-router 1.0.0.1
ip dhcp pool floor2
network 2.0.0.0 255.0.0.0
default-router 2.0.0.1
Router#show running-config
Building configuration...
Current configuration : 1443 bytes
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Router
ip dhcp excluded-address 1.0.0.4 1.0.0.8
ip dhcp excluded-address 2.0.0.4 2.0.0.8
ip dhcp pool floor1
network 1.0.0.0 255.0.0.0
default-router 1.0.0.1
ip dhcp pool floor2
network 2.0.0.0 255.0.0.0
default-router 2.0.0.1
```

```
Router#sh running-config
Building configuration...
```

```
Current configuration : 1443 bytes
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Router
ip dhcp excluded-address 1.0.0.4 1.0.0.8
ip dhcp excluded-address 2.0.0.4 2.0.0.8
ip dhcp pool floor1
network 1.0.0.0 255.0.0.0
default-router 1.0.0.1
ip dhcp pool floor2
network 2.0.0.0 255.0.0.0
default-router 2.0.0.1
```



```
aaa new-model
aaa authentication login default group tacacs+
aaa authentication enable default group tacacs+
no ip cef
no ipv6 cef
username admin password 0 admin
license udi pid CISCO1941/K9 sn FTX1524QIMR-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 1.0.0.1 255.0.0.0
ip helper-address 18.0.0.2
duplex auto
speed auto
interface GigabitEthernet0/1
ip address 2.0.0.1 255.0.0.0
duplex auto
speed auto
interface Serial0/0/0
no ip address
clock rate 2000000
shutdown
interface Serial0/0/1
ip address 50.0.0.1 255.0.0.0
clock rate 2000000
interface Serial0/1/0
no ip address
clock rate 2000000
shutdown
interface Serial0/1/1
no ip address
clock rate 2000000
shutdown
interface Vlan1
no ip address
shutdown
router eigrp 1
network 50.0.0.0
network 1.0.0.0
network 2.0.0.0
ip classless
ip flow-export version 9
no cdp run
tacacs-server host 1.0.0.13
tacacs-server key cisco
line con 0
line aux 0
line vty 0 4
end
```

Router 3

hostname Router

```
ip dhcp excluded-address 3.0.0.2
ip dhcp excluded-address 4.0.0.2
ip dhcp pool floor1
network 3.0.0.0 255.0.0.0
default-router 3.0.0.1
ip dhcp pool floor2
network 4.0.0.0 255.0.0.0
default-router 4.0.0.1
aaa new-model
aaa authentication login default group tacacs+
aaa authentication enable default group tacacs+
no ip cef
no ipv6 cef
username admin password 0 admin
license udi pid CISCO1941/K9 sn FTX152476DK-
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 Serial0/0/0
ip address 60.0.0.2 255.0.0.0
clock rate 2000000
interface Serial0/0/1
ip address 50.0.0.2 255.0.0.0
interface Serial0/1/0
no ip address
clock rate 2000000
shutdown
interface Serial0/1/1
no ip address
interface Vlan1
no ip address
shutdown
router eigrp 1
network 3.0.0.0
network 4.0.0.0
network 60.0.0.0
network 50.0.0.0
ip flow-export version 9
tacacs-server host 3.0.0.3
tacacs-server key cisco
line con 0
line aux 0
line vty 0 4
end
```

ROUTER 4

```
hostname Router
ip dhcp excluded-address 5.0.0.2 5.0.0.8
```

```
ip dhcp excluded-address 6.0.0.2 6.0.0.8
ip dhcp pool floor1
network 5.0.0.0 255.0.0.0
default-router 5.0.0.1
ip dhcp pool floor2
network 6.0.0.0 255.0.0.0
default-router 6.0.0.1
aaa new-model
aaa authentication login default group tacacs+
aaa authentication enable default group tacacs+
no ip cef
no ipv6 cef
username admin password 0 admin
license udi pid CISCO1941/K9 sn FTX1524T00V-
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 70.0.0.2 255.0.0.0
interface Serial0/0/1
ip address 80.0.0.1 255.0.0.0
clock rate 2000000
interface Serial0/1/0
no ip address
clock rate 2000000
shutdown
interface Serial0/1/1
no ip address
clock rate 2000000
shutdown
interface Vlan1
no ip address
shutdown
router eigrp 1
network 5.0.0.0
network 6.0.0.0
network 70.0.0.0
network 80.0.0.0
ip classless
ip flow-export version 9
tacacs-server host 18.0.0.2
tacacs-server key cisco
line con 0
line aux 0
line vty 0 4
end
```

ROUTER 5

```
hostname Router
ip dhcp excluded-address 7.0.0.2 7.0.0.3
ip dhcp excluded-address 8.0.0.2 8.0.0.3
ip dhcp pool floor3
network 7.0.0.0 255.0.0.0
default-router 7.0.0.1
ip dhcp pool floor4
network 8.0.0.0 255.0.0.0
default-router 8.0.0.1
aaa new-model
aaa authentication login default group tacacs+
aaa authentication enable default group tacacs+
no ip cef
no ipv6 cef
username admin password 0 admin
license udi pid CISCO1941/K9 sn FTX1524S469-
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
no ip address
clock rate 2000000
interface Serial0/0/1
ip address 80.0.0.2 255.0.0.0
interface Serial0/1/0
no ip address
clock rate 2000000
shutdown
interface Serial0/1/1
no ip address
clock rate 2000000
shutdown

interface Vlan1
no ip address
shutdown

router eigrp 1
network 8.0.0.0
network 7.0.0.0
network 80.0.0.0

ip classless

ip flow-export version
tacacs-server host 18.0.0.2
tacacs-server key cisco
```

line con 0

line aux 0

line vty 0 4
end

ROUTER 6

hostname Router
ip dhcp excluded-address 9.0.0.2 9.0.0.3
ip dhcp excluded-address 11.0.0.2 11.0.0.3

ip dhcp pool floor1
network 9.0.0.0 255.0.0.0
default-router 9.0.0.1
ip dhcp pool floor2
network 11.0.0.0 255.0.0.0
default-router 11.0.0.1

aaa new-model
aaa authentication login default group tacacs+
aaa authentication enable default group tacacs+
no ip cef
no ipv6 cef
username admin password 0 admin
license udi pid CISCO1941/K9 sn FTX1524AAWR-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 9.0.0.1 255.0.0.0
duplex auto
speed auto

interface GigabitEthernet0/1
ip address 11.0.0.1 255.0.0.0
duplex auto
speed auto

interface Serial0/0/0
no ip address
clock rate 2000000
shutdown

interface Serial0/0/1
ip address 100.0.0.2 255.0.0.0
clock rate 2000000

interface Serial0/1/0
no ip address
clock rate 2000000
shutdown

interface Serial0/1/1
no ip address

```
clock rate 2000000  
shutdown
```

```
interface Vlan1  
no ip address  
shutdown
```

```
router eigrp 1  
network 100.0.0.0  
network 9.0.0.0  
network 11.0.0.0
```

```
ip classless
```

```
ip flow-export version 9  
tacacs-server host 19.0.0.2  
tacacs-server key cisco  
line con 0  
line aux 0  
line vty 0 4  
end
```

ROUTER 7

```
hostname Router
ip dhcp excluded-address 12.0.0.2 12.0.0.3
ip dhcp excluded-address 12.0.0.2 13.0.0.3
ip dhcp excluded-address 13.0.0.2 13.0.0.3
ip dhcp excluded-address 12.0.0.2
ip dhcp excluded-address 12.0.0.3 12.0.0.4

ip dhcp pool floo03
network 12.0.0.0 255.0.0.0
default-router 12.0.0.1
ip dhcp pool floo04
network 13.0.0.0 255.0.0.0
default-router 13.0.0.1
ip dhcp pool floor3
network 12.0.0.0 255.0.0.0
default-router 12.0.0.1
ip dhcp pool floor4
network 12.0.0.0 255.0.0.0
default-router 12.0.0.1
aaa new-model

aaa authentication login default group tacacs+
aaa authentication enable default group tacacs+
no ip cef
no ipv6 cef
username admin password 0 admin
license udi pid CISCO1941/K9 sn FTX15249331-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 12.0.0.1 255.0.0.0
duplex auto
speed auto

interface GigabitEthernet0/1
ip address 13.0.0.1 255.0.0.0
duplex auto
speed auto

interface Serial0/0/0
ip address 90.0.0.2 255.0.0.0
clock rate 2000000

interface Serial0/0/1
ip address 100.0.0.1 255.0.0.0

interface Serial0/1/0
no ip address
clock rate 2000000
shutdown

interface Serial0/1/1
```

```
no ip address
clock rate 2000000
shutdown
interface Vlan1
no ip address
shutdown
```

```
router eigrp 1
network 90.0.0.0
network 100.0.0.0
network 12.0.0.0
network 13.0.0.0
```

```
ip classless
```

```
ip flow-export version 9
tacacs-server host 18.0.0.2
tacacs-server key cisco
line con 0
```

```
line aux 0
```

```
line vty 0 4
end
```

ROUTER 8

```
hostname building4
aaa new-model
```

```
aaa authentication login default group tacacs+
aaa authentication enable default group tacacs+
no ip cef
no ipv6 cef
username admin password 0 admin
license udi pid CISCO1941/K9 sn FTX1524NYPG-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 21.0.0.1 255.0.0.0
duplex auto
speed auto
```

```
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
```

```
interface Serial0/0/0
ip address 110.0.0.1 255.0.0.0
```

```
interface Serial0/0/1
```



```
no ip address
clock rate 2000000
shutdown
```

```
interface Serial0/1/0
ip address 30.0.0.2 255.0.0.0
clock rate 2000000
interface Serial0/1/1
ip address 40.0.0.1 255.0.0.0
```

```
interface Vlan1
no ip address
shutdown
```

```
router eigrp 1
network 110.0.0.0
network 30.0.0.0
network 40.0.0.0
```

```
ip classless
```

```
ip flow-export version 9
no cdp run
tacacs-server host 21.0.0.2
tacacs-server key cisco
line con 0
```

```
line aux 0
```

```
line vty 0 4
End
```

```
Router 9
hostname Router
```

```
ip dhcp excluded-address 14.0.0.3
ip dhcp excluded-address 15.0.0.3
```

```
ip dhcp pool floor1
network 14.0.0.0 255.0.0.0
default-router 14.0.0.1
ip dhcp pool floor2
network 15.0.0.0 255.0.0.0
default-router 15.0.0.1
aaa new-model
```

```
aaa authentication login default group tacacs+
aaa authentication enable default group tacacs+
no ip cef
no ipv6 cef
username admin password 0 admin
license udi pid CISCO1941/K9 sn FTX1524836P-
spanning-tree mode pvst
interface GigabitEthernet0/0
ip address 15.0.0.1 255.0.0.0
```

duplex auto
speed auto

interface GigabitEthernet0/1
ip address 14.0.0.1 255.0.0.0
duplex auto
speed auto

interface Serial0/0/0
ip address 110.0.0.2 255.0.0.0
clock rate 2000000
interface Serial0/0/1
ip address 120.0.0.1 255.0.0.0

interface Serial0/1/0
no ip address
clock rate 2000000
shutdown

interface Serial0/1/1
no ip address
clock rate 2000000
shutdown

interface Vlan1
no ip address
shutdown

router eigrp 1
network 120.0.0.0
network 110.0.0.0
network 14.0.0.0
network 15.0.0.0

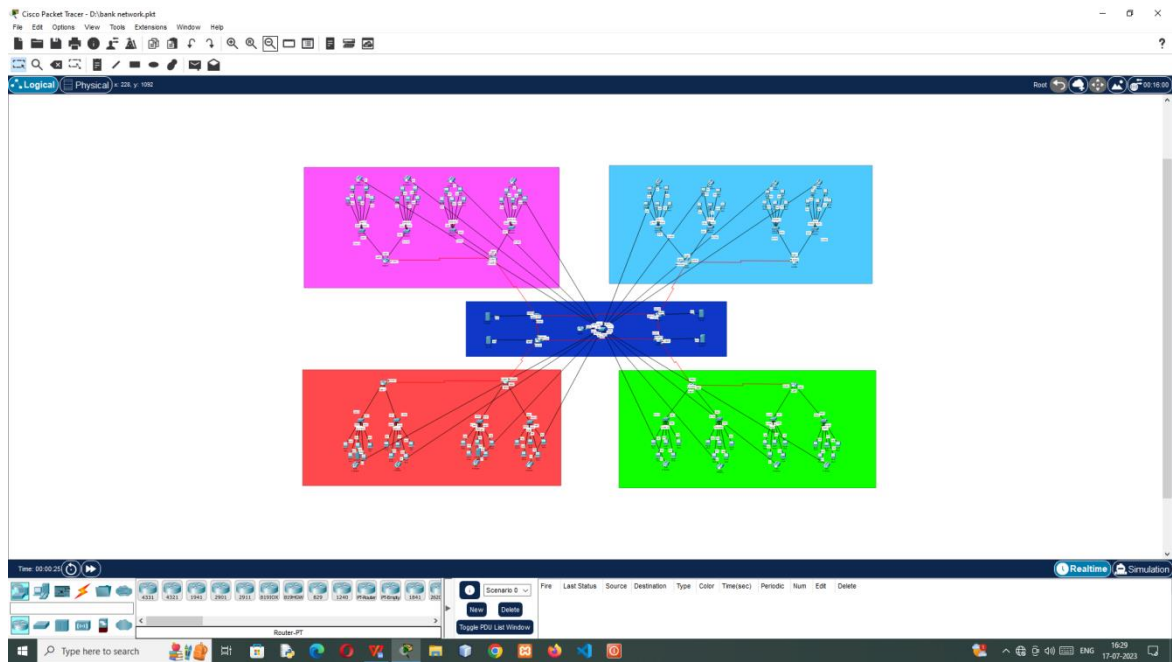
ip classless

ip flow-export version 9
tacacs-server host 21.0.0.2
tacacs-server key cisco
line con 0

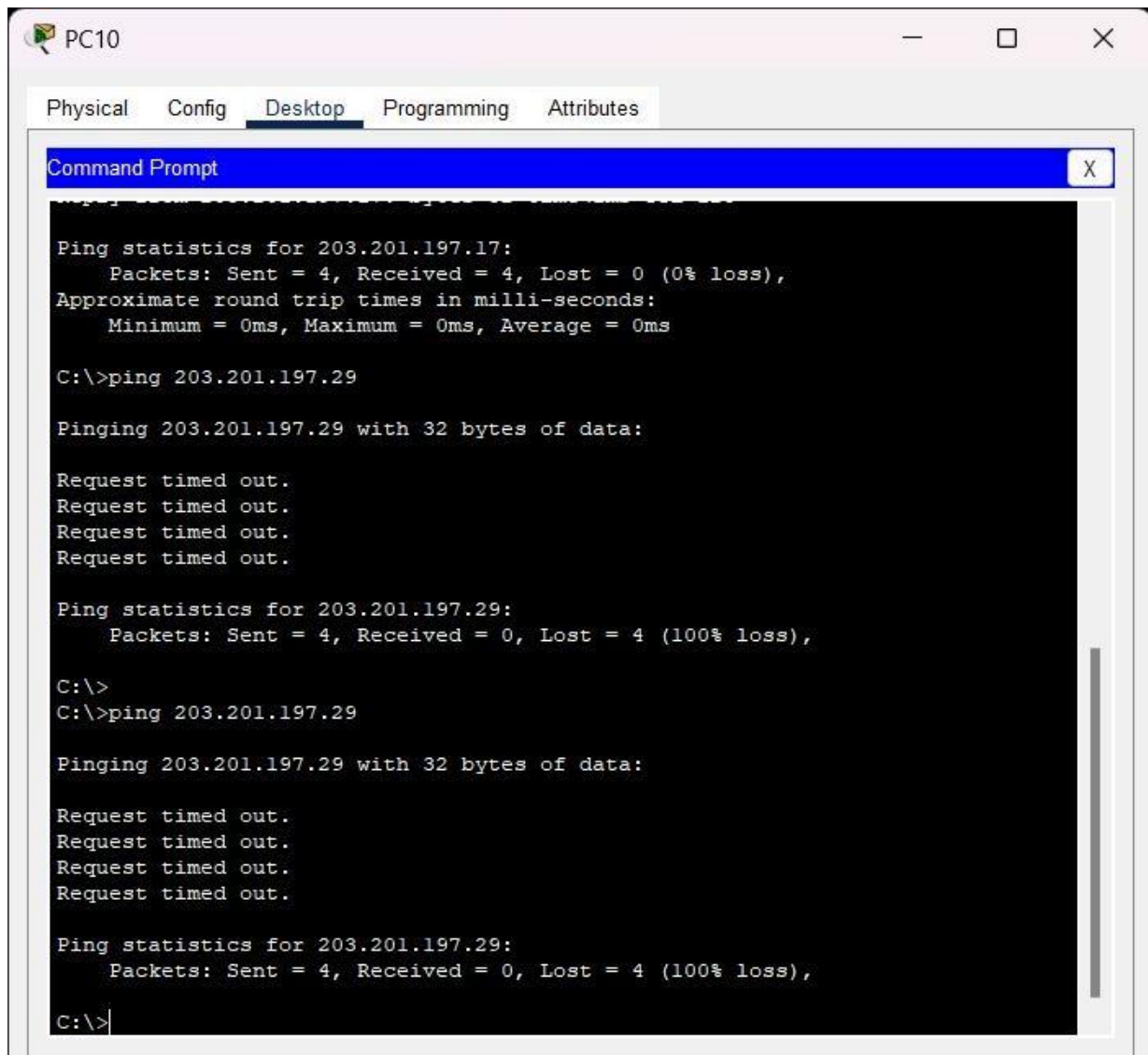
line aux 0

line vty 0 4
End

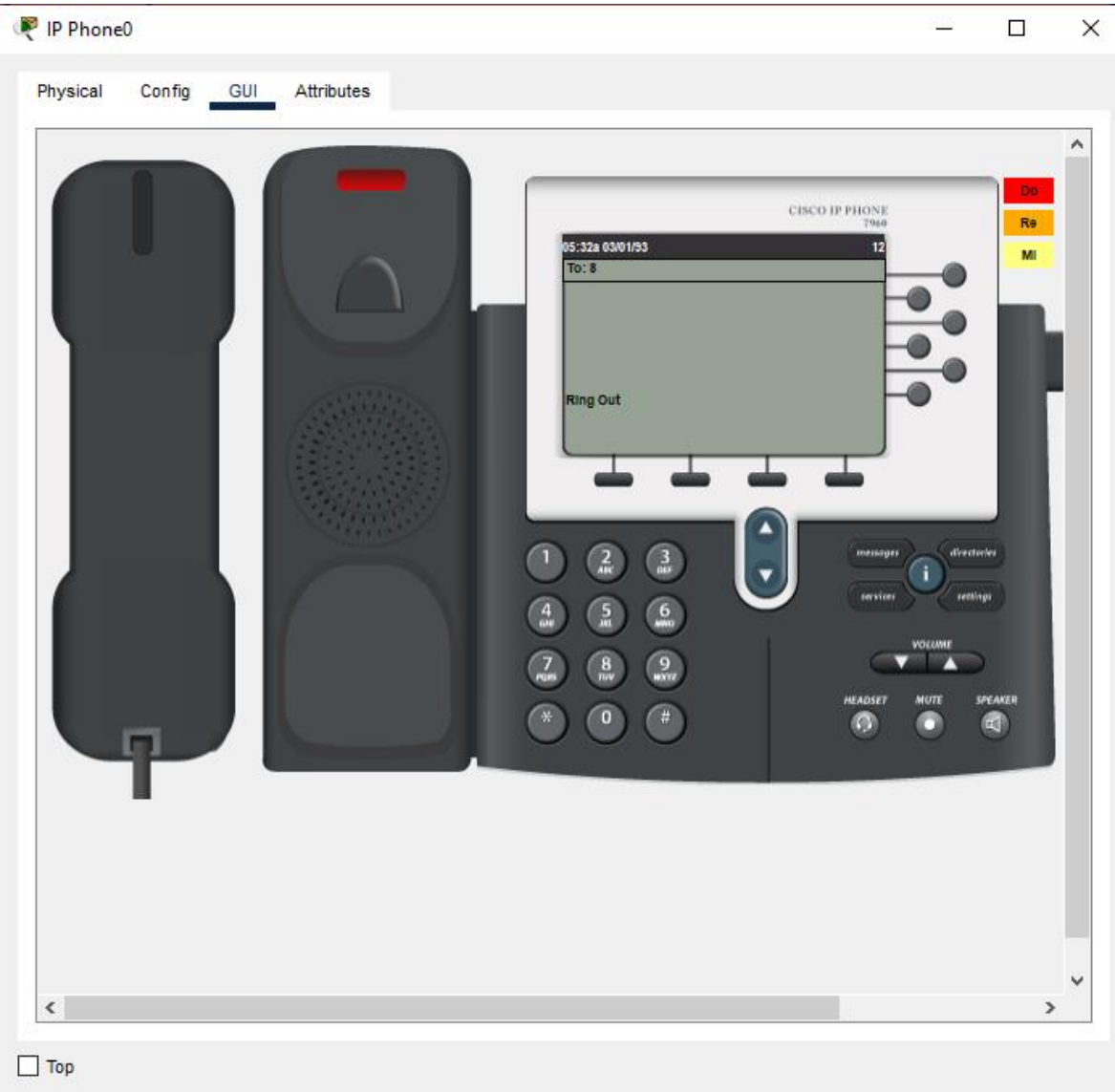
NETWORK TOPOLOGY




COMMUNICATION BETWEEN PC



COMMUCATION BETWEEN TELEPHONE



AAA IN ROUTER

 Router6

Physical

Config

CLI

Attributes

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 50.0.0.1 (Serial0/0/1) is up: new adjacency
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 60.0.0.1 (Serial0/0/0) is up: new adjacency
%DHCPD-4-PING_CONFLICT: DHCP address conflict:  server pinged 3.0.0.1.
%DHCPD-4-PING_CONFLICT: DHCP address conflict:  server pinged 4.0.0.1.

User Access Verification

Username: admin
Password:
Router>en
Username:
Password:
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
```

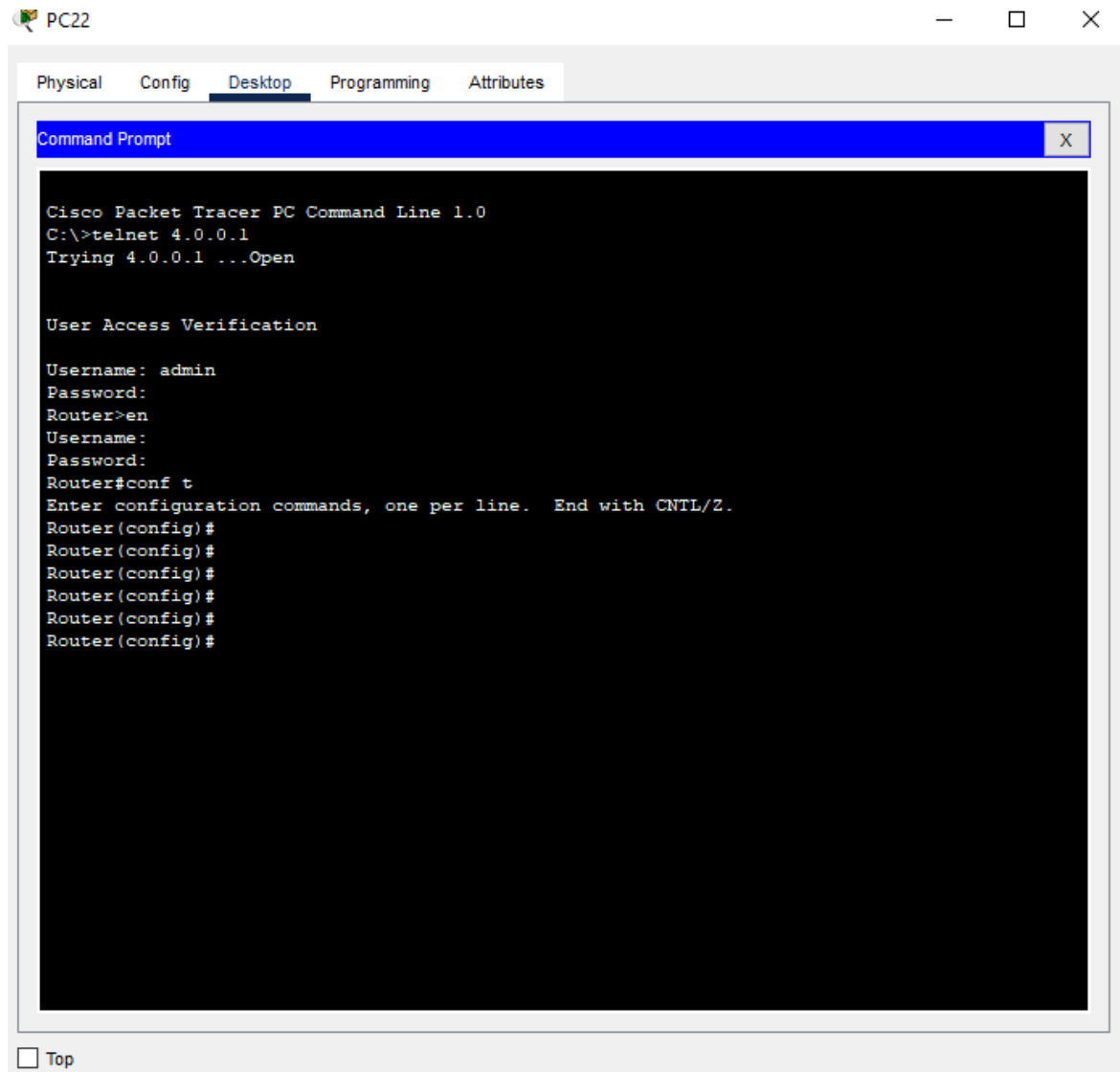
Ctrl+F6 to exit CLI focus

Copy

Paste

☐ Top

AAA IN PC



CONCLUSION

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.

