Proof Of Concept (PoC)

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Task: Fully Secured Network using various security measures like port security, Access Control List (ACL), VLSM, etc.

Given Tasks

1. Using IP 180.100.0.0/16 divide IPs for the users 3000, 500, 20 respectively using VLSM (Variable Length Subnet Mask).
2. Apply routing, ACL (Access Control List), port security on the following PCs.
    - PC1- can't communicate with server
    - PC5- can't connect through HTTP
    - PC4- can't connect through FTP
    - PC3- Apply port security

❖ First, we will do the subnetting

1. In first network 3000 IPs are required
2. In second network 500 IPs are required
3. In third network 20 IPs are required
4. Fourth required 2 IPs (Router to Router)
5. Fifth requires 2 IPs (Router to Router)

- For first network the range will be as follows

180.100.0.0 to 180.100.15.255 with subnet 255.255.240.0

- For second network the range will be as follows

180.100.16.0 to 180.100.17.255 with subnet 255.255.254.0

- For third network the range will be as follows

180.100.18.0 to 180.100.18.31 with subnet 255.255.255.224

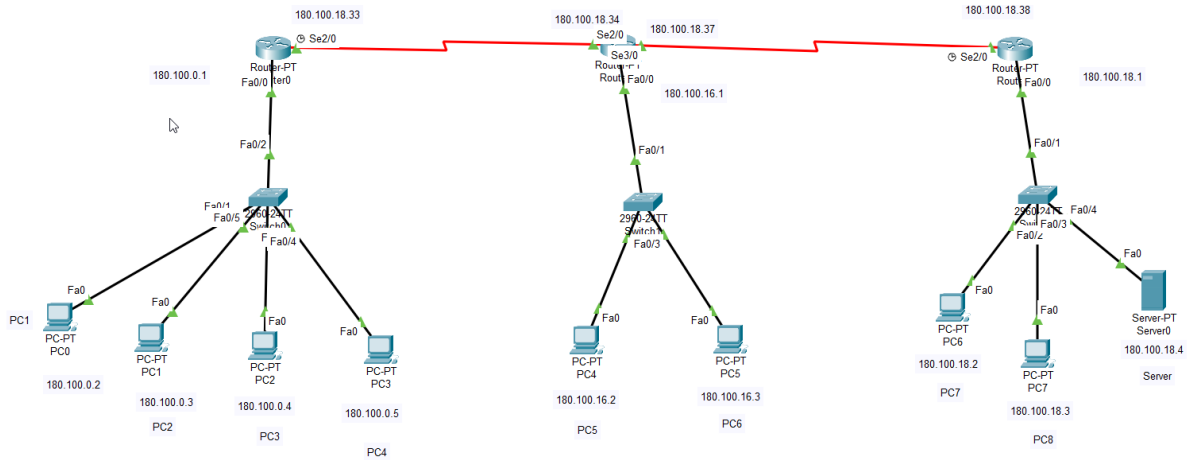
- For fourth network the range will be as follows

180.100.18.32 to 180.100.18.35 with subnet 255.255.255.252

- For fifth network the range will be as follows

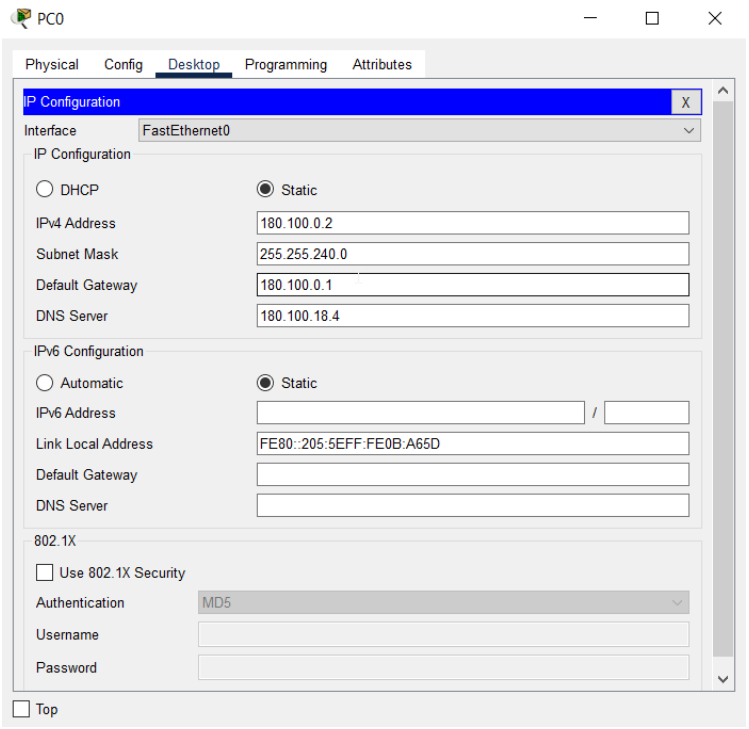
180.100.18.36 to 180.100.18.39 with subnet 255.255.255.252

❖ After all calculations we will make the connections using routers, switch and PCs. as follows in Cisco Packet Tracer which is a simulation.

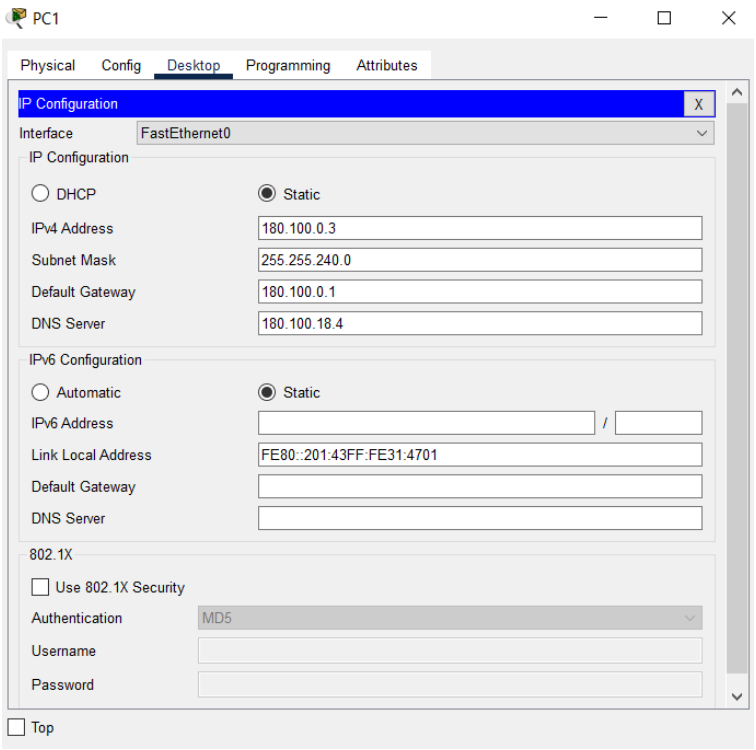


Then we will configure all the PCs as follows

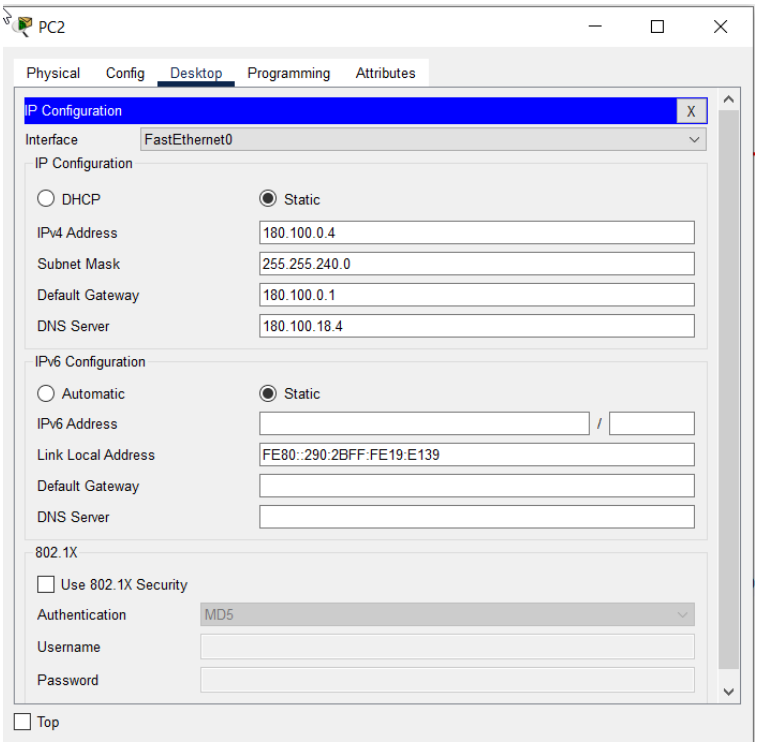
The Configuration of first PC is



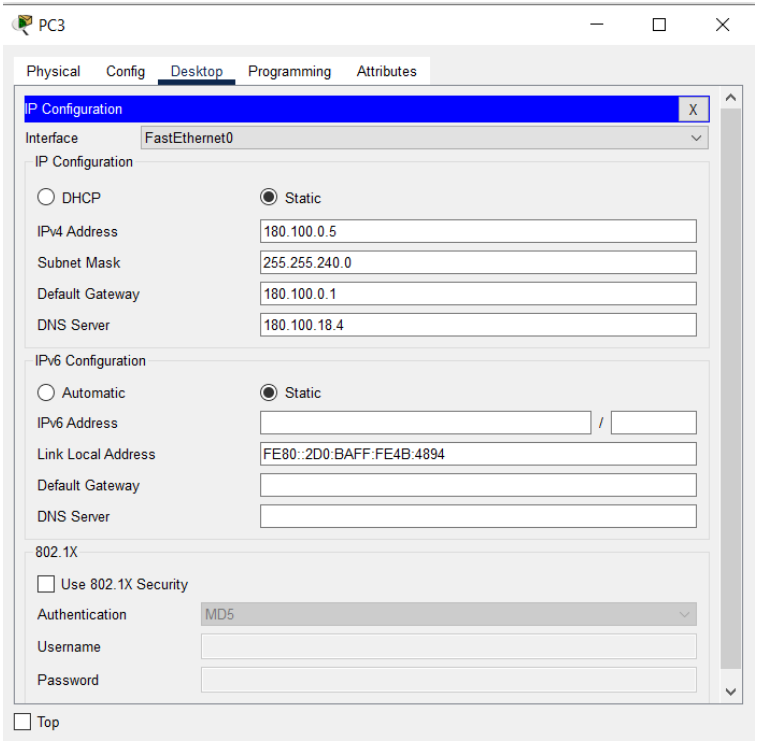
The configuration of second PC is



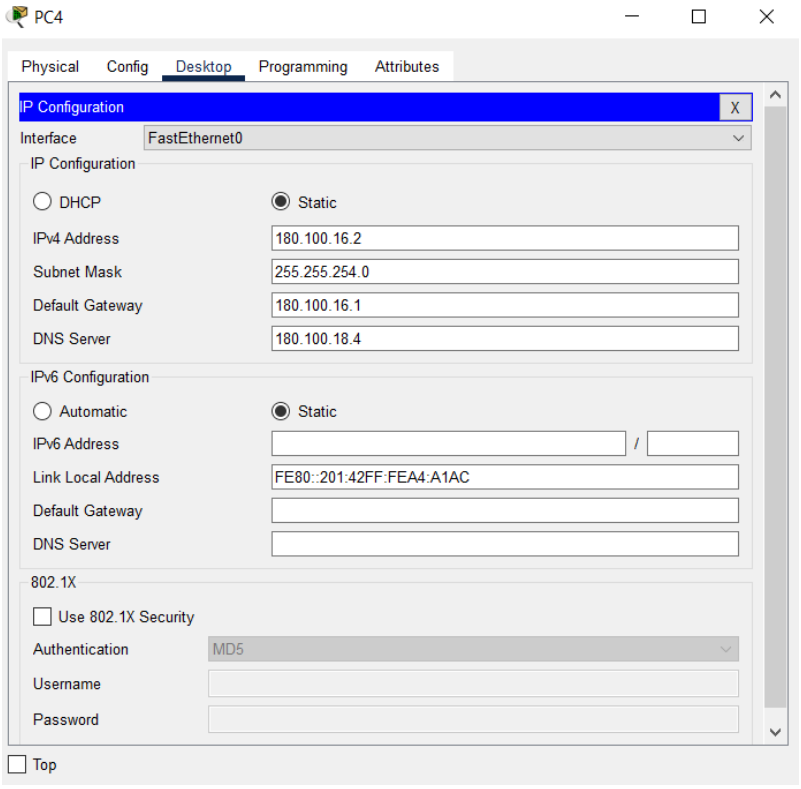
The configuration of third pc is



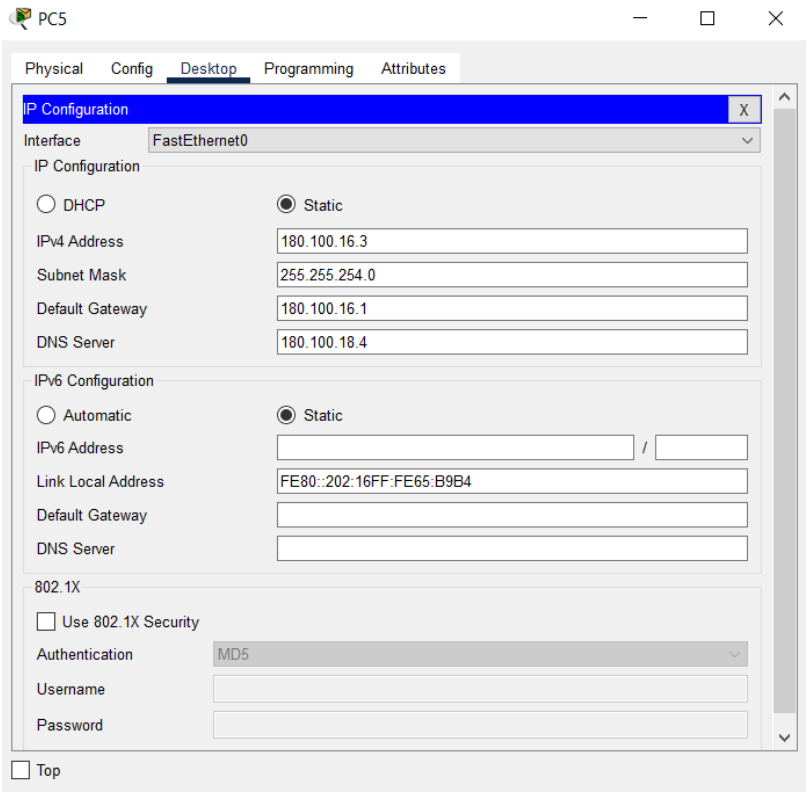
The configuration of fourth pc is



The configuration of fifth pc is

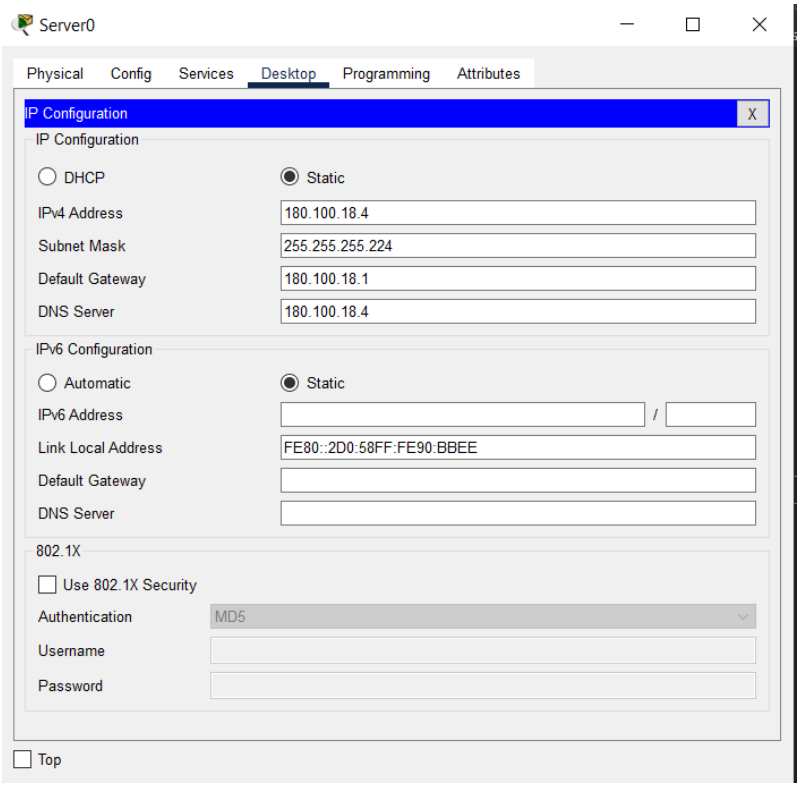


The configuration of sixth pc is



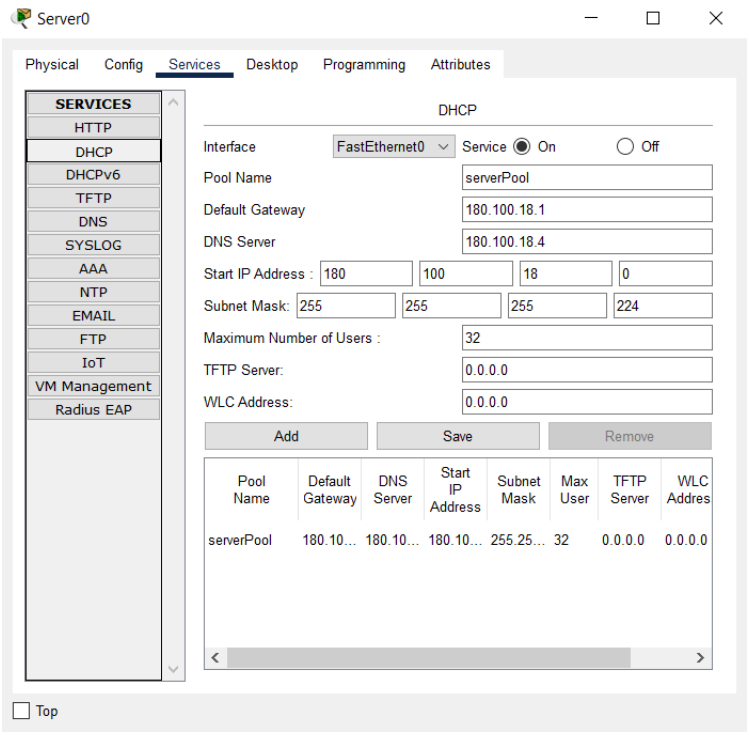
❖ Now we will configure the server

First, we will configure the IP of server

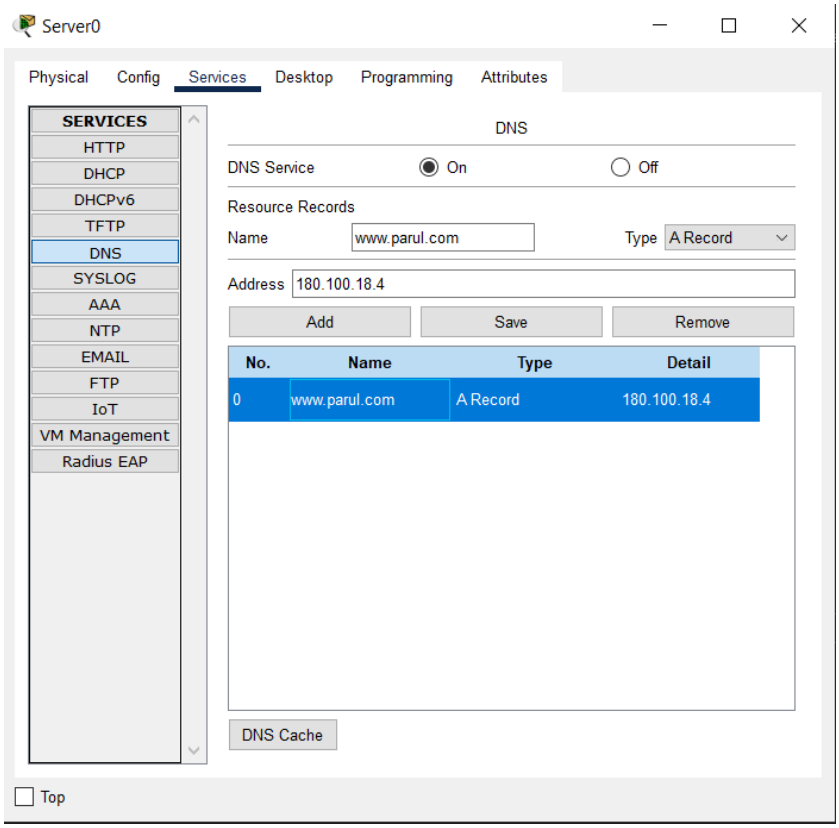


We will also configure DHCP, DNS and FTP services on the server

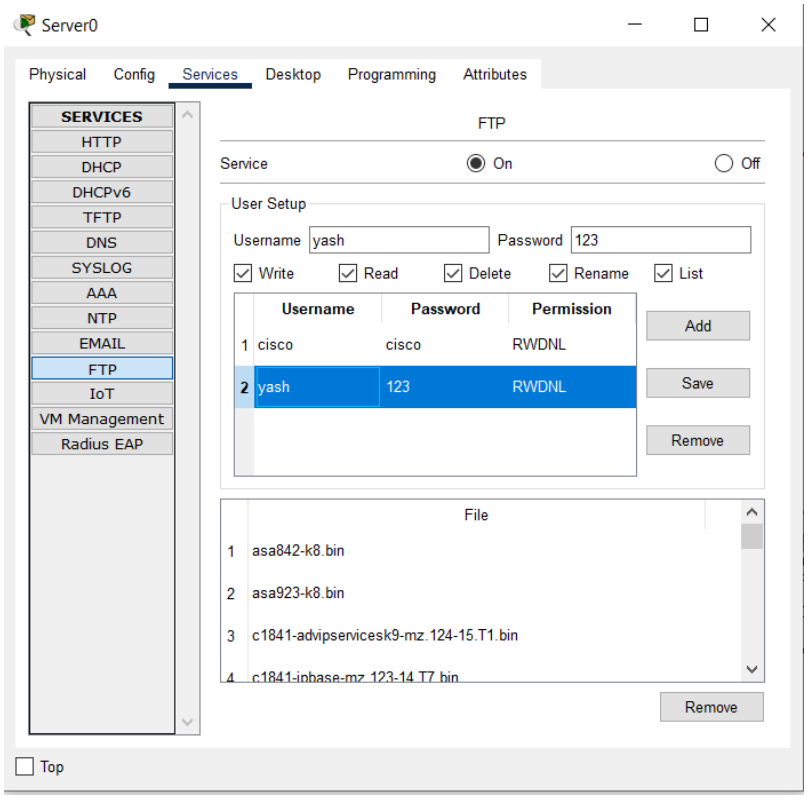
DHCP:



DNS:


Server0
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
www.parul.com
Type
A Record
Address
180.100.18.4
Add
Save
Remove
No.
Name
Type
Detail
0
www.parul.com
A Record
180.100.18.4
DNS Cache
Top

FTP:


Server0
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Attributes
SERVICES
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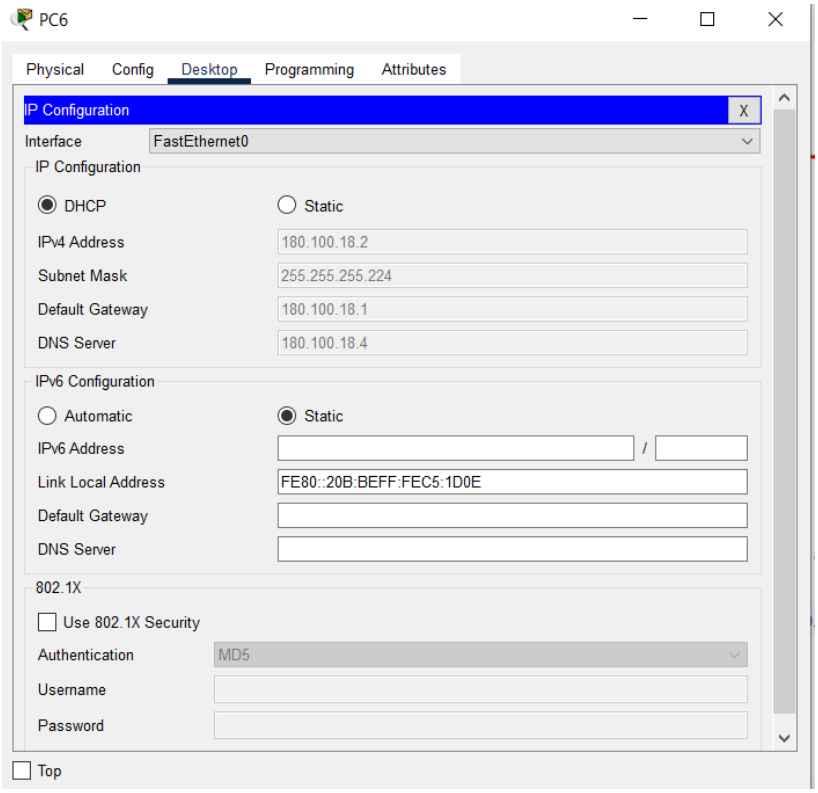
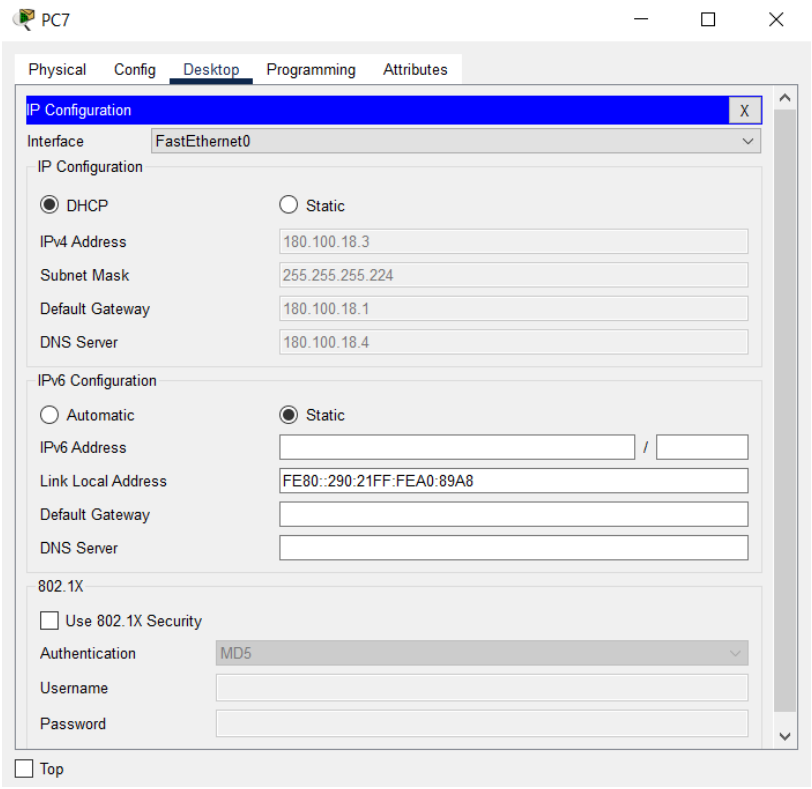
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
FTP
Service
On
Off
User Setup
Username
yash
Password
123
Write
Read
Delete
Rename
List
Username
Password
Permission
1
cisco
cisco
RWDNL
2
yash
123
RWDNL
Add
Save
Remove
File
1
asa842-k8.bin
2
asa923-k8.bin
3
c1841-advipservicesk9-mz.124-15.T1.bin
4
c1841-ipbase-mz.123-14.T7.bin
Remove
Top

After configuring DHCP server we will provide IP configurations to PC7 and PC8 using DHCP

The configuration of seventh PC is

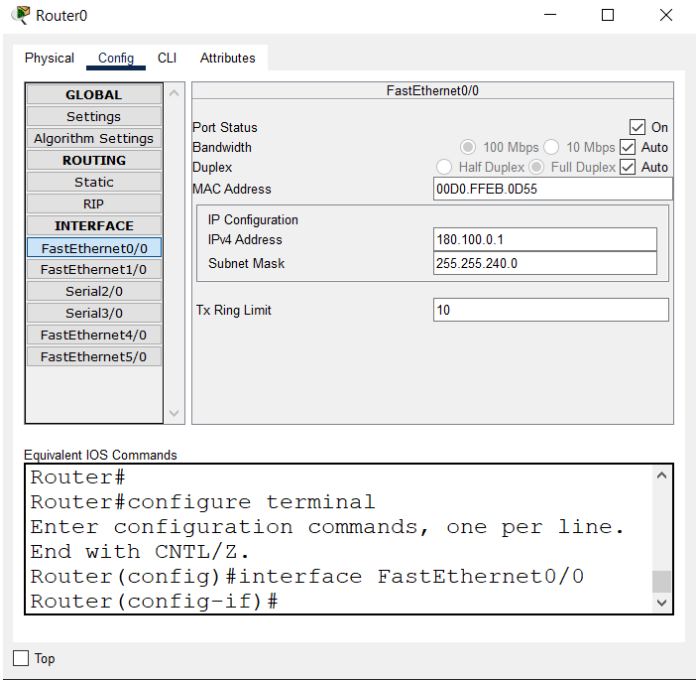


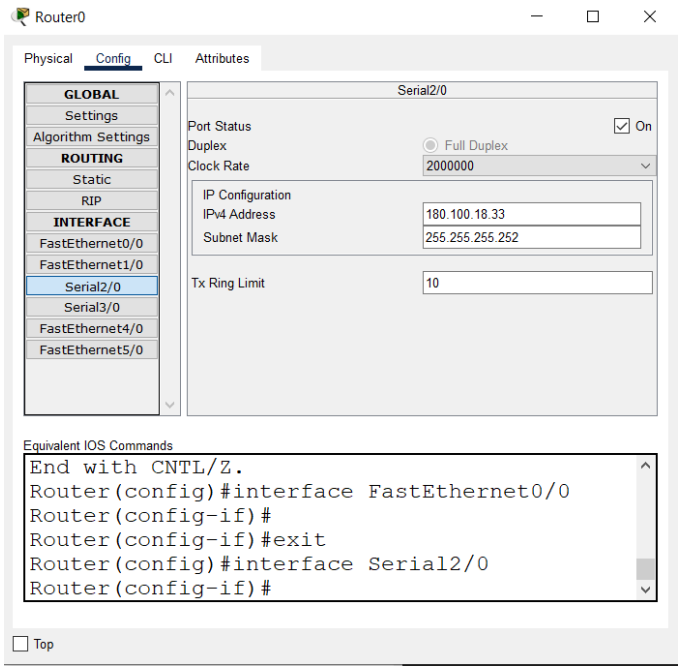
The configuration of eighth PC is



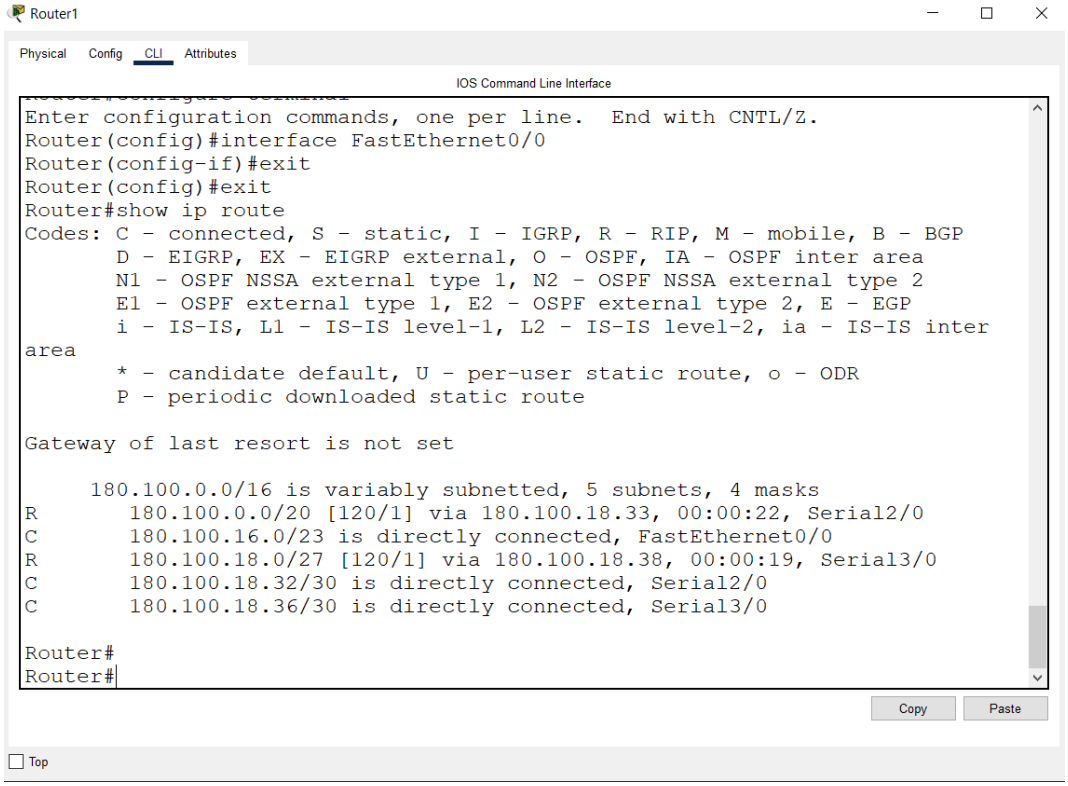
❖ Now we will configure first routers

First, adding IP address on connected ports

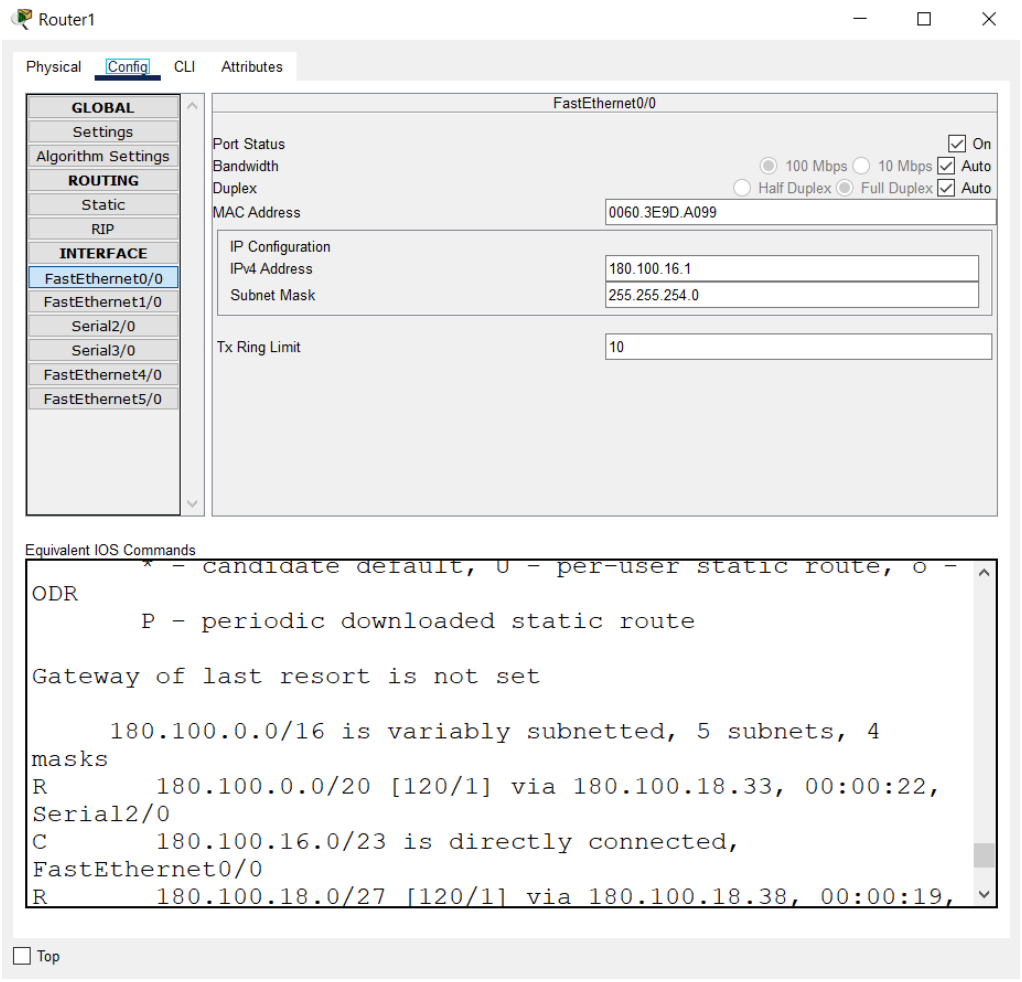


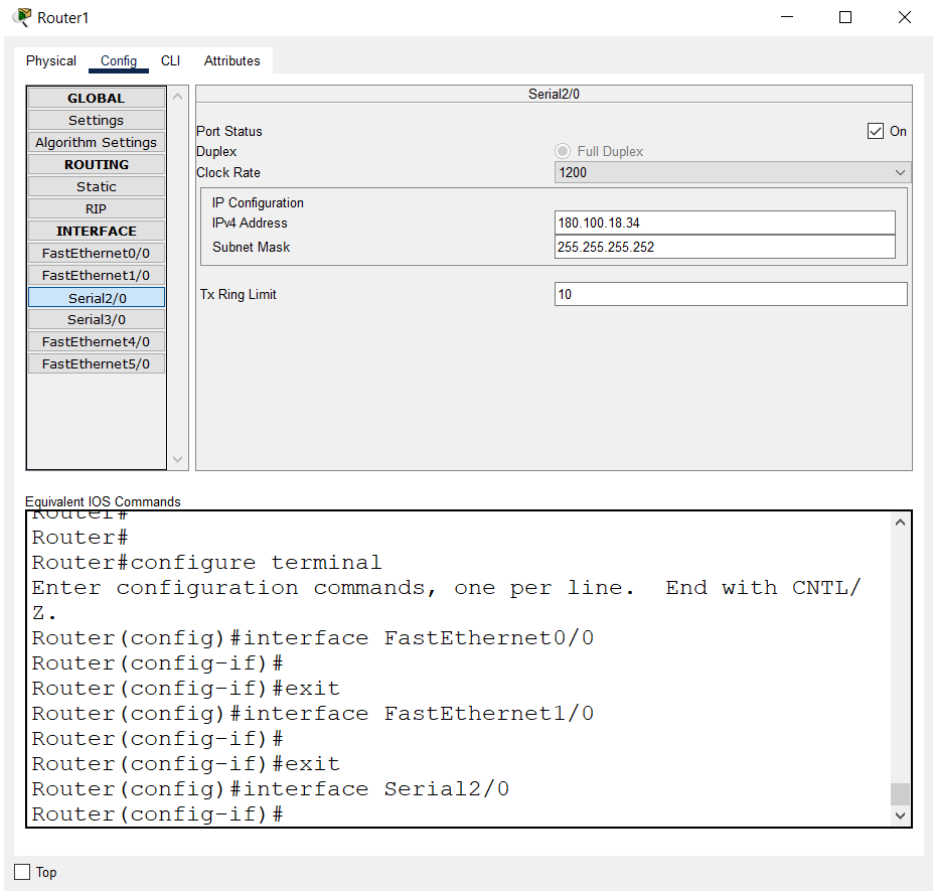


After this we will do routing



❖ Then we will configure second router


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0060.3E9D.A099
IP Configuration
IPv4 Address
180.100.16.1
Subnet Mask
255.255.254.0
Tx Ring Limit
10
Equivalent IOS Commands
* - candidate default, U - per-user static route, o -
ODR
P - periodic downloaded static route
Gateway of last resort is not set
180.100.0.0/16 is variably subnetted, 5 subnets, 4
masks
R 180.100.0.0/20 [120/1] via 180.100.18.33, 00:00:22,
Serial2/0
C 180.100.16.0/23 is directly connected,
FastEthernet0/0
R 180.100.18.0/27 [120/1] via 180.100.18.38, 00:00:19,
Top


Router1
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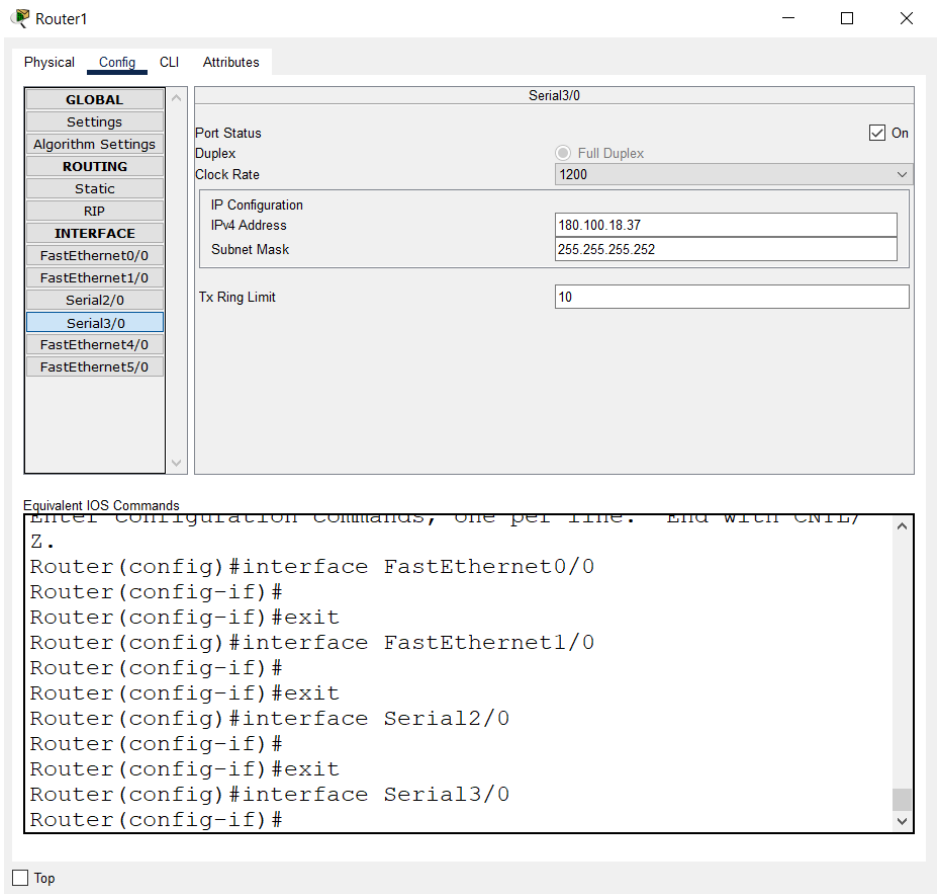
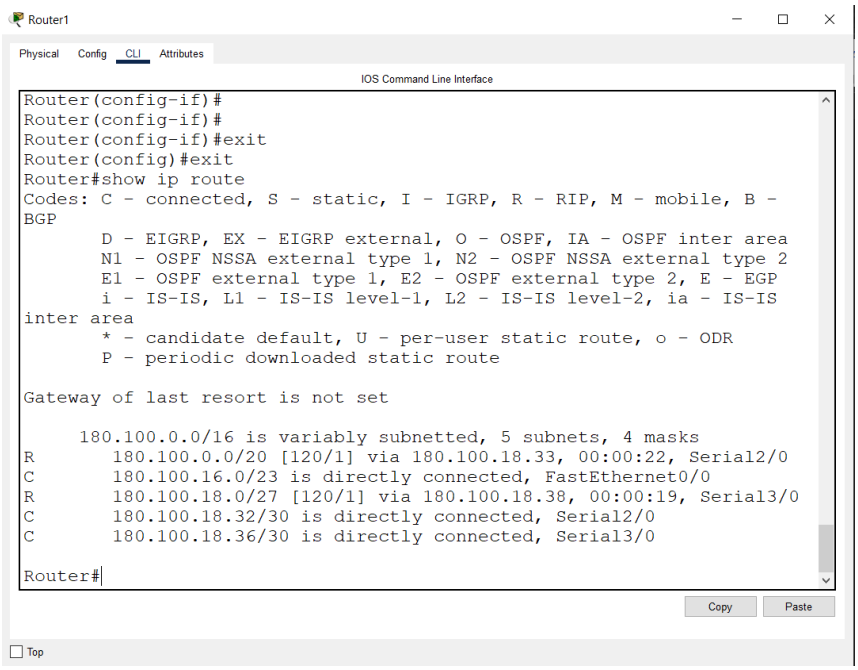
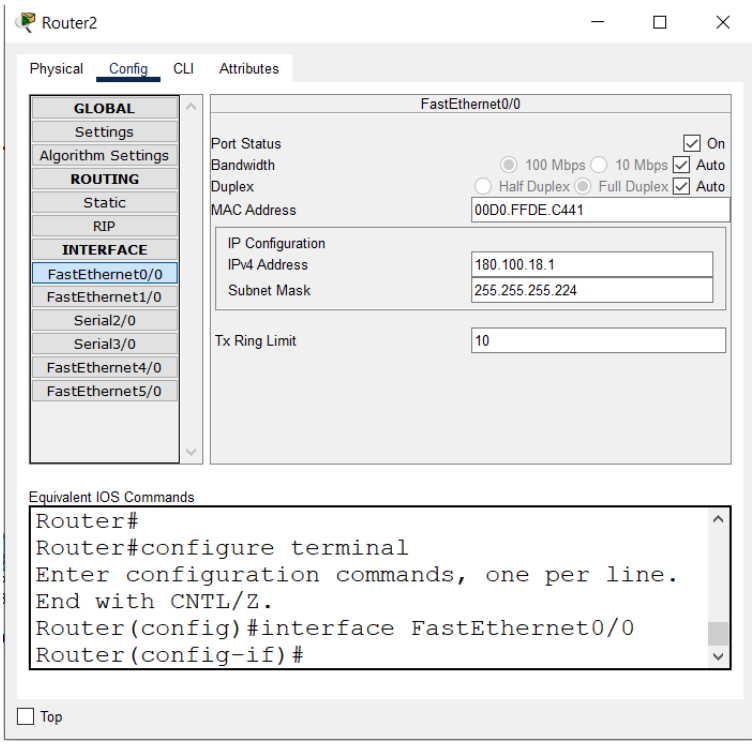
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial2/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IPv4 Address
180.100.18.34
Subnet Mask
255.255.255.252
Tx Ring Limit
10
Equivalent IOS Commands
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/
Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Top

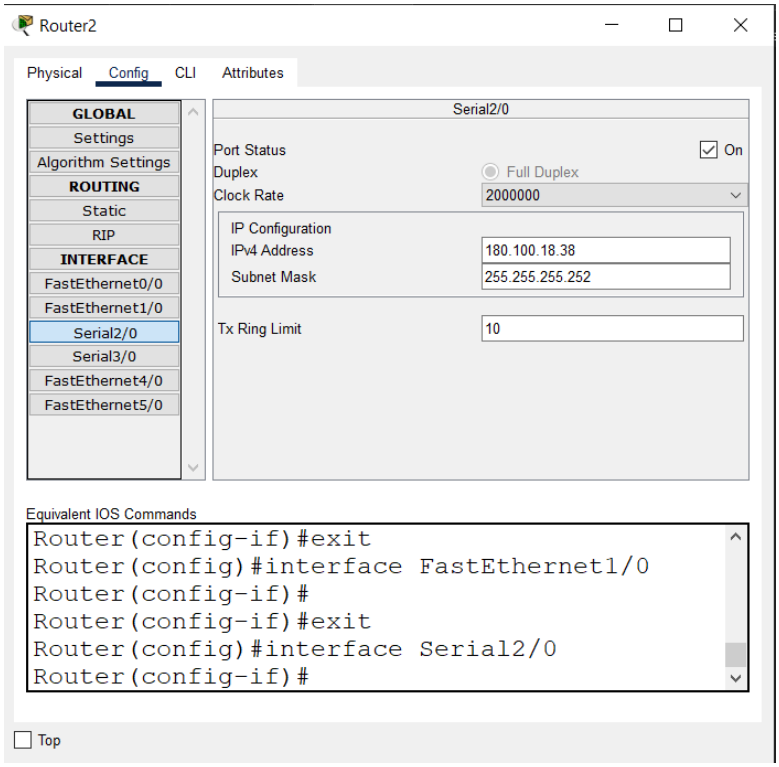

Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
Serial3/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IPv4 Address
180.100.18.37
Subnet Mask
255.255.255.252
Tx Ring Limit
10
Equivalent IOS Commands
Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#
Top

Then we will do routing

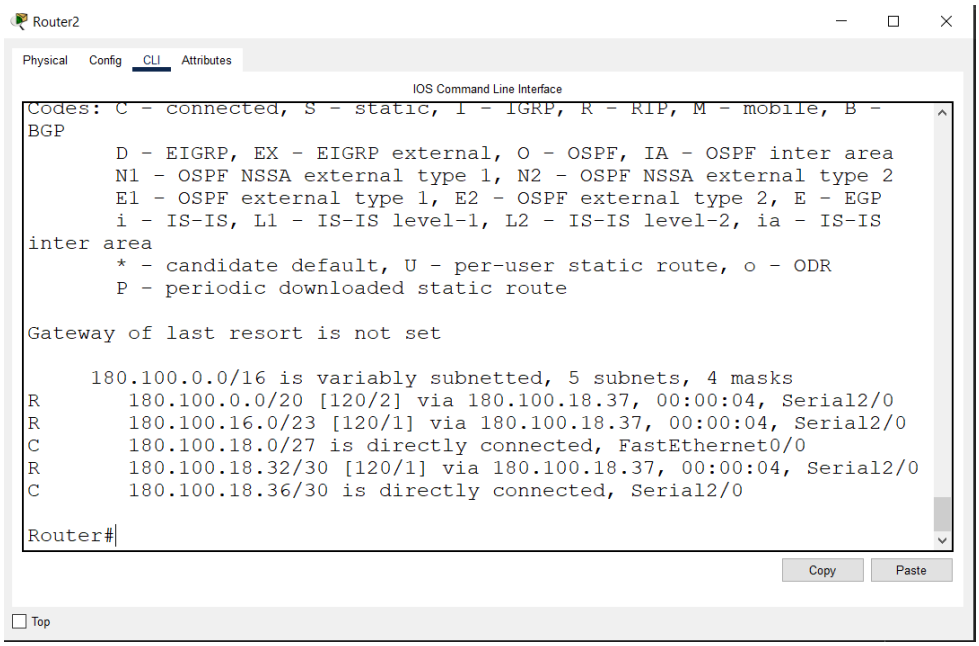


❖ Now we will configure third router





Now we will do routing



❖ Now we will apply port security

```
Switch(config-if)#
Switch(config-if)#do show history
  int f0/4
  switchport mode access
  switchport port-security
  switchport port-security maximum 1
  switchport port-security mac-address 00D0.BC77.E6A2
  do show port-security
  do show history
Switch(config-if)#
```

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Then we will configure access list on router 3 using following commands

- Router(config)#access-list 110 deny ip 180.100.0.2 0.0.0.0 180.100.18.4 0.0.0.0
- Router(config)#access-list 110 deny udp 180.100.16.2 0.0.0.0 180.100.18.4 0.0.0.0 eq domain
- Router(config)#access-list 110 deny tcp 180.100.0.5 0.0.0.0 180.100.18.4 0.0.0.0 eq ftp
- Router(config)#access-list 110 permit ip any any
- Router(config)#int f0/0
- Router(config-if)#ip access-group 110 out

Router2

Physical Config CLI Attributes

IOS Command Line Interface

```
     180.100.0.0/16 is variably subnetted, 5 subnets, 4 masks
R       180.100.0.0/20 [120/2] via 180.100.18.37, 00:00:04, Serial2/0
R       180.100.16.0/23 [120/1] via 180.100.18.37, 00:00:04, Serial2/0
C       180.100.18.0/27 is directly connected, FastEthernet0/0
R       180.100.18.32/30 [120/1] via 180.100.18.37, 00:00:04, Serial2/0
C       180.100.18.36/30 is directly connected, Serial2/0

Router#
Router#
Router#
Router#show acc
Router#show access-lists
Extended IP access list 110
    10 deny ip host 180.100.0.2 host 180.100.18.4 (3 match(es))
    20 deny udp host 180.100.16.2 host 180.100.18.4 eq domain (4 match(es))
    30 deny tcp host 180.100.0.5 host 180.100.18.4 eq ftp (15 match(es))
    40 permit ip any any (37 match(es))

Router#
```

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Top

So here using all above commands we have finally created our secured network.