

Lab Task: 12

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Name: Muhammad Sherjeel Akhtar

Roll No: 20p-0101

Subject: Computer Networks Lab

**Submitted To Respected
Ma'am: Hurmat Hidayat**

Section: BCS-5B

Requirement:

Answer:

Topology:

First of all, we are going to create a topology that will contain.

- 3 PC's
- 2 Switches
- 2 Routers
- 2 Servers

Visual Demonstration:

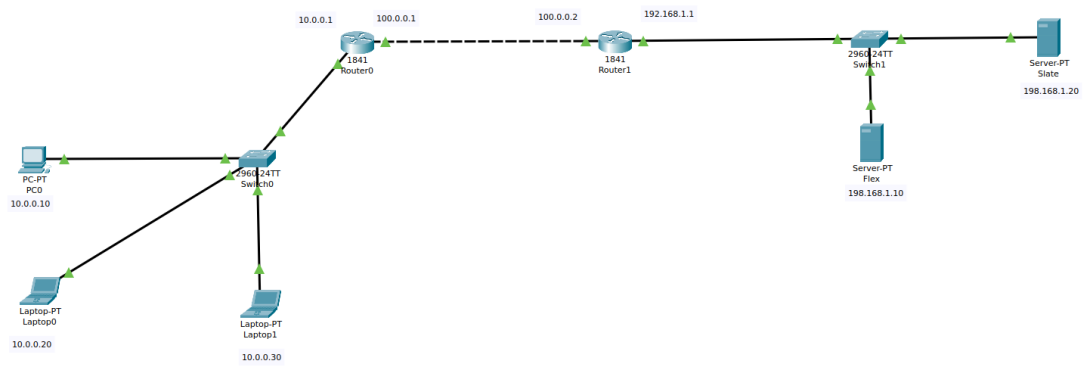
We've connected the following.

- Three PC's with a Switch.
- The Switch is Connected to a router.
- The Router is further on connected to a second router.
- The Second Router is Attached to a Switch.
- Two Servers **One for Flex, Second For Slate** are connected to the second Router by using a Switch.

KeyPoints:

- Assign Static IP's To The PC's
- Assign IP's statically to the routers.
- Assign IP's to the both servers i.e **Flex and Slate**.

This work can be easily visualized by the picture i'm attaching below.



IP Configuration For The PC's:

IP configuration for the first PC:

PC0

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 10.0.0.10

Subnet Mask 255.0.0.0

Default Gateway 10.0.0.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::209:7CFF:FEAA:1137

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

IP configuration for the second PC:

Laptop0

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 10.0.0.20

Subnet Mask 255.0.0.0

Default Gateway 10.0.0.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::201:43FF:FEB2:6254

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

IP configuration for the Third PC:

Laptop1 [min] [max] [close]

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.0.0.30

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: [] / []

Link Local Address: FE80::20A:41FF:FEDD:B9C1

Default Gateway: []

DNS Server: []

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username: []

Password: []

☐ Top

IP Configuration For Slate Server:

Laptop1 [Window Title Bar]

Physical Config **Desktop** Programming Attributes

IP Configuration [Close X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.0.0.30

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: [Empty] / [Empty]

Link Local Address: FE80::20A:41FF:FEDD:B9C1

Default Gateway: [Empty]

DNS Server: [Empty]

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username: [Empty]

Password: [Empty]

☐ Top

IP Configuration For Flex Server:

Flex

Physical Config Services Desktop Programming Attributes

IP Configuration
X

IP Configuration

☐ DHCP
☒ Static

IPv4 Address

192.168.1.10

Subnet Mask

255.255.255.0

Default Gateway

192.168.1.1

DNS Server

0.0.0.0

IPv6 Configuration

☐ Automatic
☒ Static

IPv6 Address

 /

Link Local Address

FE80::20B:BEFF:FE88:9C8B

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

Assigning IP's And Activating Ports For The Routers:

Here we are going to activate **Ports** and assign IP's for both sides of the routers where there is connection.

For Router0:

IOS Command Line Interface

```
191K bytes of NVRAM.
63488K bytes of ATA CompactFlash (Read/Write)
Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version 12.4(15)T1, RELEASE
SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team

Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

R1>en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int fa0/0
R1(config-if)#ip add
% Incomplete command.
R1(config-if)#exit
R1(config)#interface FastEthernet0/0
R1(config-if)#ip address 10.0.0.1 255.0.0.0
R1(config-if)#ip address 10.0.0.1 255.0.0.0
R1(config-if)#
R1(config-if)#exit
R1(config)#interface FastEthernet0/0
R1(config-if)#
R1(config-if)#exit
R1(config)#interface FastEthernet0/1
R1(config-if)#ip address 100.0.0.1 255.0.0.0
R1(config-if)#ip address 100.0.0.1 255.0.0.0
R1(config-if)#
```

For Router1:

```
Processor board ID FTX0947Z10E
M860 processor: part number 0, mask 49
2 FastEthernet/IEEE 802.3 interface(s)
191K bytes of NVRAM.
63488K bytes of ATA CompactFlash (Read/Write)
Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version 12.4(15)T1, RELEASE
SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team

Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

R2>en
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#
R2(config)#interface FastEthernet0/0
R2(config-if)#ip address 192.168.1.1 255.255.255.0
R2(config-if)#ip address 192.168.1.1 255.255.255.0
R2(config-if)#
R2(config-if)#exit
R2(config)#interface FastEthernet0/0
R2(config-if)#
R2(config-if)#exit
R2(config)#interface FastEthernet0/1
R2(config-if)#ip address 100.0.0.2 255.0.0.0
R2(config-if)#ip address 100.0.0.2 255.0.0.0
R2(config-if)#
```

NAT Configuration For Both Of The Routers:

First of all we will configure the R1 for the purpose of *NAT TRANSLATION*.

R1 NAT Configuration:

We will do configuration for R1 using **CLI(Command Line Interface)**.

Visual Demonstration:

```

R1(config-if)#
R1(config-if)#
R1(config-if)#R1(config)#ip nat inside source s^Z
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip nat inside source static 10.0.0.10 50.0.0.10
R1(config)#interface FastEthernet 0/0
R1(config-if)#ip nat inside
R1(config-if)#exit
R1(config)#
R1(config)#interface FastEthernet 0/1
R1(config-if)#ip nat outside
R1(config-if)#exit
R1(config)#ip nat inside source static 10.0.0.20 50.0.0.20
R1(config)#ip nat inside source static 10.0.0.30 50.0.0.30
R1(config)#

```

R2 NAT Configuration:

We will do configuration for R2 using **CLI(Command Line Interface)**.

```

R1(config-if)#
R1(config-if)#R1(config)#ip nat inside source s^Z
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip nat inside source static 10.0.0.10 50.0.0.10
R1(config)#interface FastEthernet 0/0
R1(config-if)#ip nat inside
R1(config-if)#exit
R1(config)#
R1(config)#interface FastEthernet 0/1
R1(config-if)#ip nat outside
R1(config-if)#exit
R1(config)#ip nat inside source static 10.0.0.20 50.0.0.20
R1(config)#ip nat inside source static 10.0.0.30 50.0.0.30
R1(config)#

```

KeyPoint:

For the NAT we will do,

- Assign inside NAT IP.
- Assign outside NAT IP.
- Assign the Inside NAT and Outside NAT for both of the routers.

Validating The Previously Build Topology:

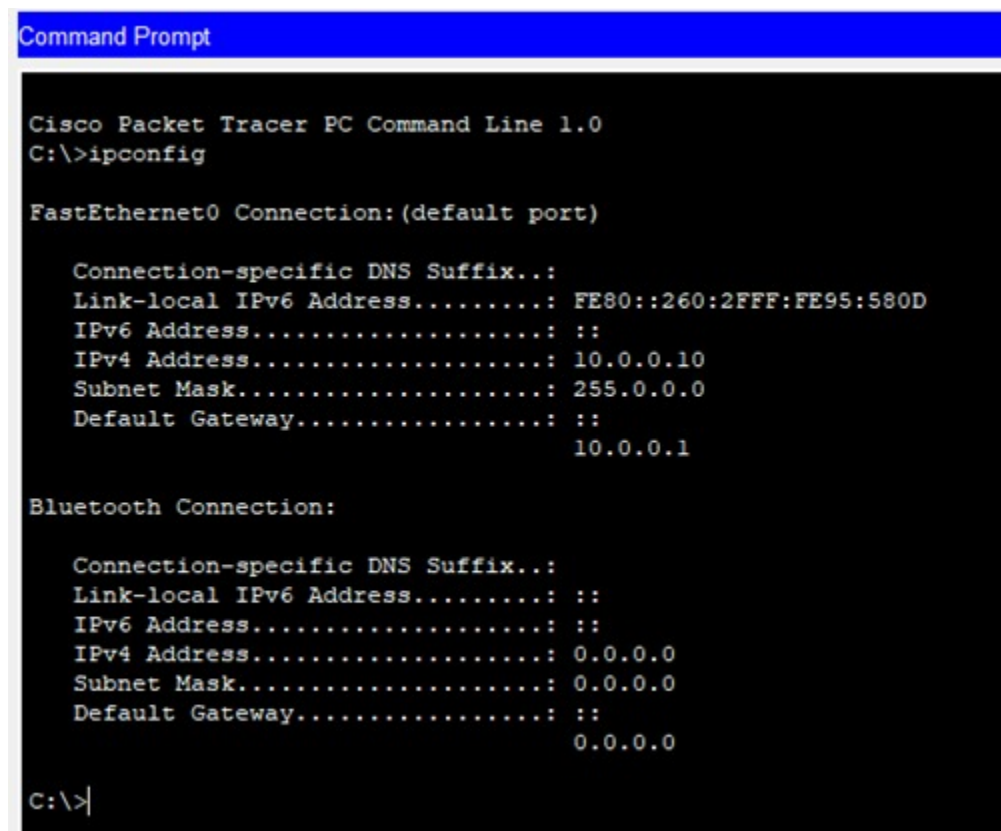
As we have successfully build our topology, now we will test the working of our Topology.

For this Purpose,

Procedure of Testing:

- Initially run the “**ipconfig**” command.
- The ping the IP assigned which is **200.0.0.10** using “**ping 200.0.0.10**” on command prompt.
- Then ping using the command “**ping 192.168.1.10**”.

Visual Demonstration:



```
Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::260:2FFF:FE95:580D
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 10.0.0.10
    Subnet Mask . . . . .: 255.0.0.0
    Default Gateway . . . . .: ::
                                   10.0.0.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                   0.0.0.0

C:\>
```

Initial Ping To 200.0.0.10:

```
C:\>ping 200.0.0.10

Pinging 200.0.0.10 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 200.0.0.10: bytes=32 time=11ms TTL=126
Reply from 200.0.0.10: bytes=32 time=11ms TTL=126
```

Pinging The Second IP: 192.168.1.20:

```
C:\>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

Pinging The Third IP: 192.168.1.10:

```
C:\>ping 192.168.1.10

Pinging 192.168.1.10 with 32 bytes of data:

Reply from 10.0.0.1: Destination host unreachable.
Reply from 10.0.0.1: Destination host unreachable.
Request timed out.
Reply from 10.0.0.1: Destination host unreachable.

Ping statistics for 192.168.1.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

Conclusion:

As you can see from the results recently obtained, we've performed several Ping Test. The results of those test's are attached in the Screenshots above.

End.....!