

PRACTICAL 9

AIM: To implement NAT

NAT means network address translation

- Why do we require it?

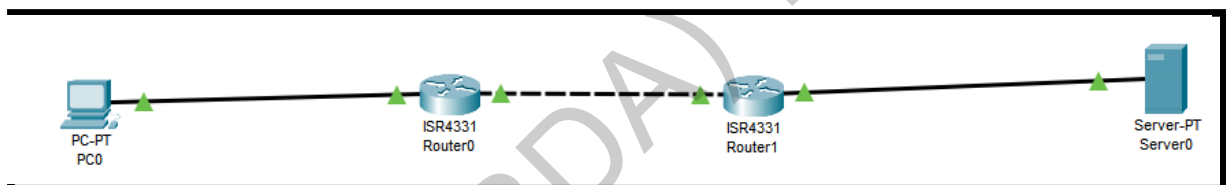
To convert public ip to private and private to public ip

- What are the benefits of using it?

Practically all device need to connect with internet where public ip is required giving every device to public ip is next to impossible causes numerous cost and increase traffic so we do implement NAT concept.

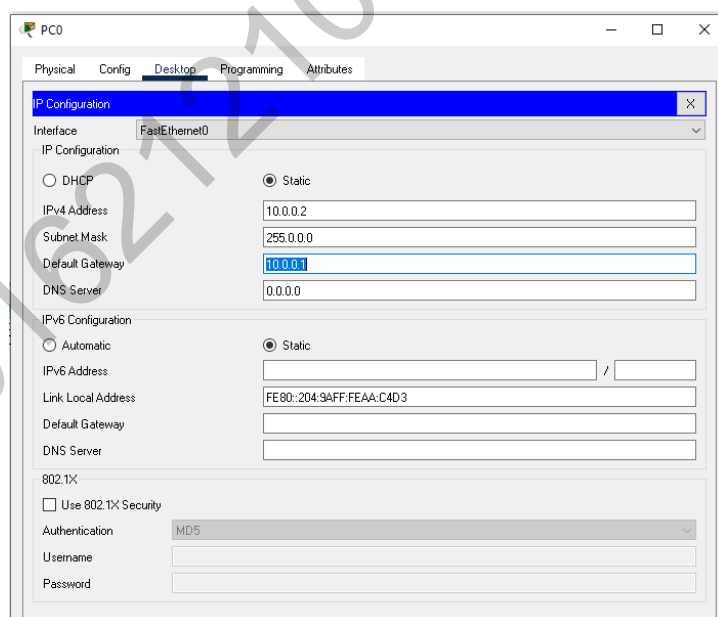
Lets start with static NAT first

Make below type of network



Then do as follow

Give ip address to PC0

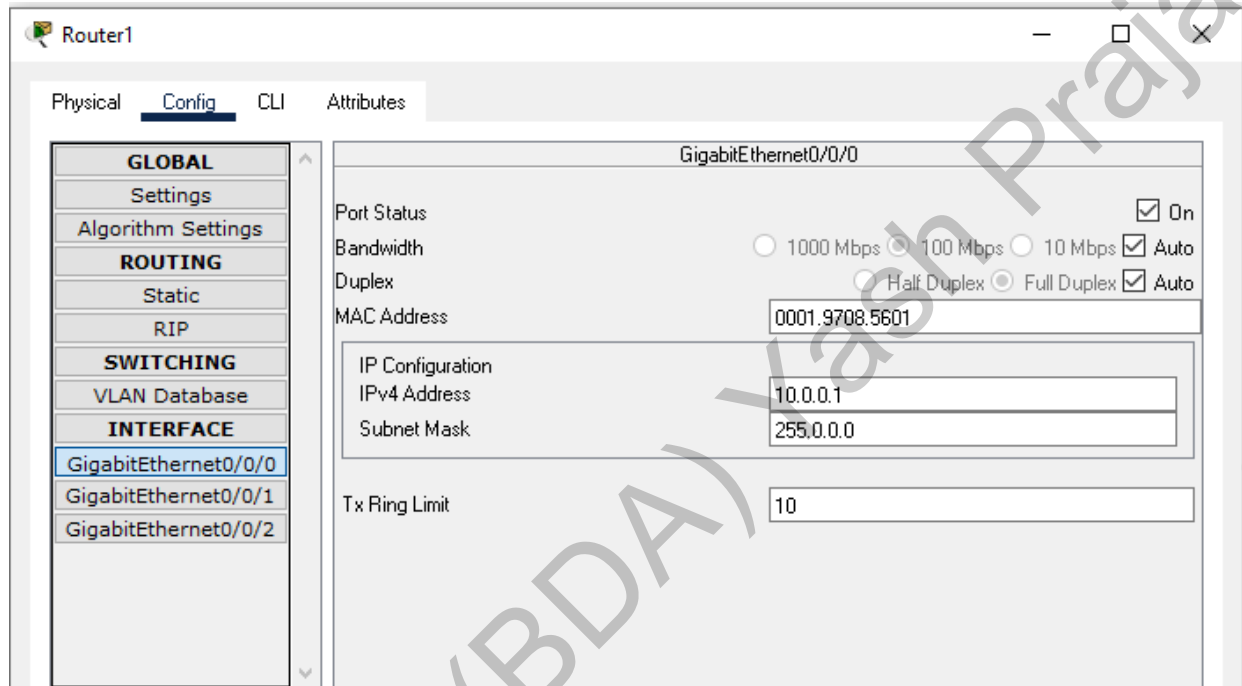


I have created totally 3 networks

- 10.0.0.0
- 20.0.0.0
- 30.0.0.0

So start with pco then give ip address to router1 on both interface

1 interface connected to pc



2 interface connected to Router

Router1

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

GigabitEthernet0/0/1

Port Status ☒ On

Bandwidth ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0001.9708.5602

IP Configuration

IPv4 Address 20.0.0.1

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Now similarly configure router1

Router2

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

GigabitEthernet0/0/0

Port Status ☒ On

Bandwidth ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0040.0B40.C901

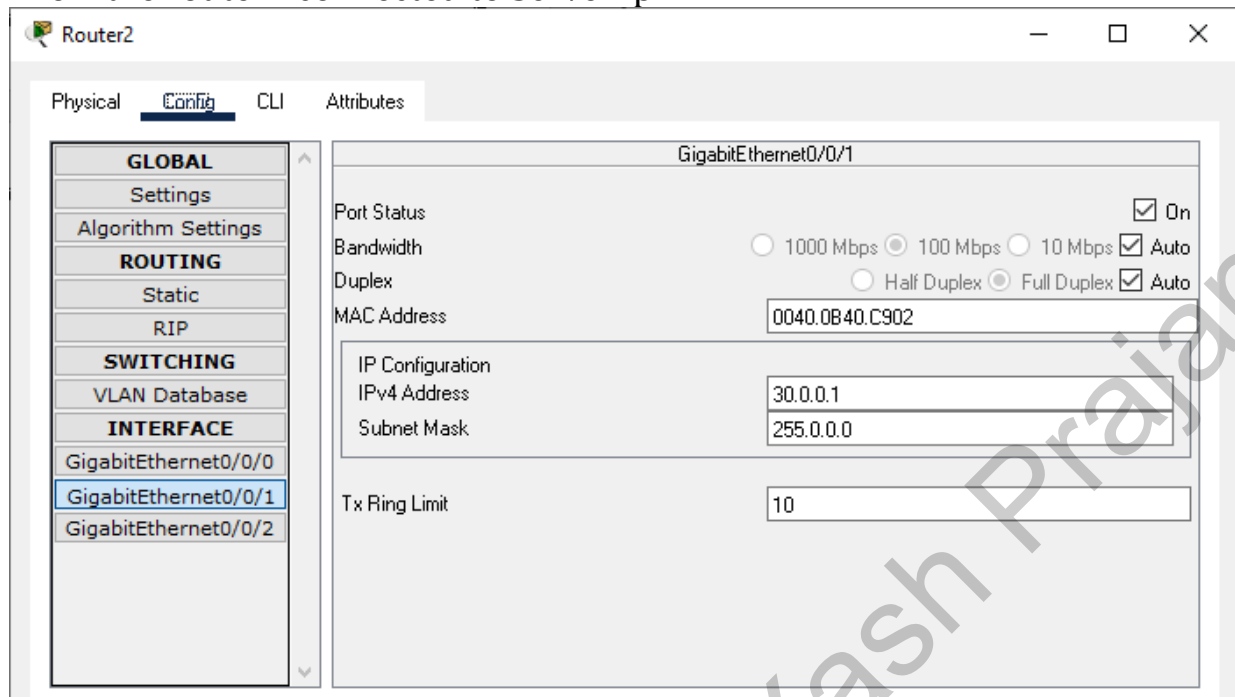
IP Configuration

IPv4 Address 20.0.0.2

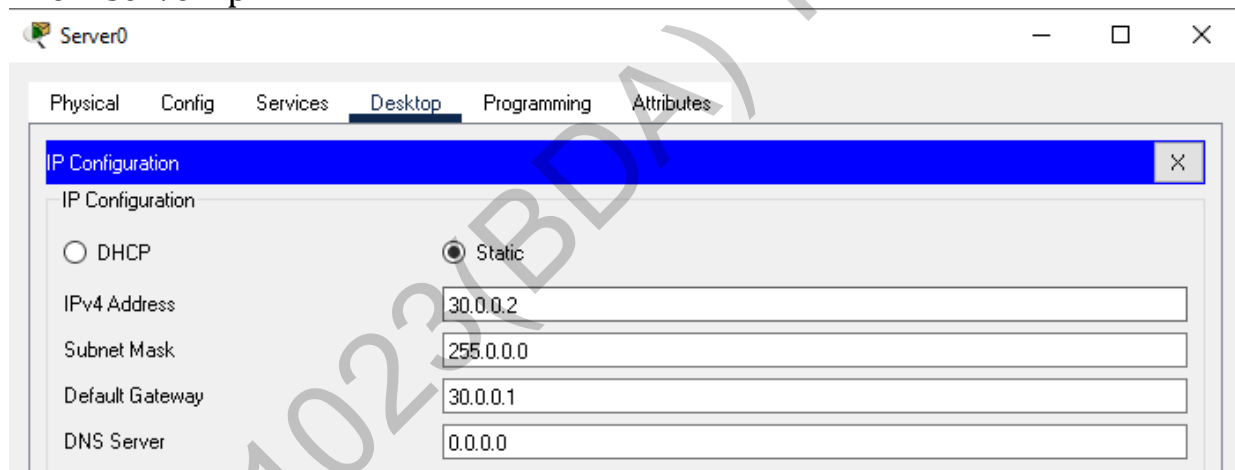
Subnet Mask 255.0.0.0

Tx Ring Limit 10

Now the router2 connected to Server ip



Now server Ip



Now add Routing to both routers

Then we do implement NAT and for that use Below commands

- It requires three steps for configuration of Static NAT.

1. Define IP address mapping.
2. Define inside local interface.
3. Define inside global interface.

Router(config)# ip nat inside source static [inside local ip address] [inside global IP address]

Static NAT Configuration on R2.

```
R1(config)#ip nat inside source static 10.0.0.2 50.50.50.50
```

```
R1(config)#interface FastEthernet 0/0
```

```
R1(config-if)#ip nat inside
```

```
R1(config-if)#exit
```

```
R1(config)#
```

```
R1(config)#interface Serial 0/0/0
```

```
R1(config-if)#ip nat outside
```

```
R1(config-if)#exit
```

Static NAT Configuration on R2.

```
R2(config)#ip nat inside source static 30.0.0.2 50.50.50.50
```

```
R2(config)#interface FastEthernet 0/0
```

```
R2(config-if)#ip nat inside
```

```
R2(config-if)#exit
```

```
R2(config)#
```

```
R2(config)#interface Serial 0/0/0
```

```
R2(config-if)#ip nat outside
```

```
R2(config-if)#exit
```

```
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#network 30.0.0.0
Router(config-router)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to
down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up

Router(config-router)#
Router(config-router)#exit
Router(config)#ip nat source static 10.0.0.2 50.50.50.50
^
% Invalid input detected at '^' marker.

Router(config)#ip nat inside source static 10.0.0.2 50.50.50.50
^
% Invalid input detected at '^' marker.

Router(config)#ip nat inside source static 10.0.0.2 50.50.50.50
Router(config)#int
Router(config)#interface F
Router(config)#interface G
Router(config)#interface GigabitEthernet 0/0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#interface Gi
Router(config)#interface GigabitEthernet 0/0/1
Router(config-if)#ip nat outside
Router(config-if)#exit
Router(config)#
```

PDU Information at Device: Router2

At Device: Router2
Source: PC0
Destination: Server0

OSI Model Inbound PDU Details Outbound PDU Details

In Layers

Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 50.50.50.50, Dest. IP: 30.0.0.2 ICMP Message Type: 8
Layer 2: Ethernet II Header 0001.9708.5602 >> 0060.2F33.3901
Layer 1: Port GigabitEthernet0/0/0

Out Layers

Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 50.50.50.50, Dest. IP: 30.0.0.2 ICMP Message Type: 8
Layer 2: Ethernet II Header 0060.2F33.3902 >> 0006.2AB9.4EAC
Layer 1: Port(s): GigabitEthernet0/0/1

1. The CEF table has an entry for the destination IP address.
2. The device decrements the TTL on the packet.

Challenge Me << Previous Layer Next Layer >>

Hence we have given 50.50.50.50 to all as a public ip so it will go out with this ip in the network