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# **LAB ASSESSMENT-4**

**SLOT: L49-L50**

## **CSE 3502: INFORMATION SECURITY MANAGEMENT**

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## Experiment : Implementing Dynamic NAT and view NAT translations

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### Lab Assessment - 4

Experiment: Implement Dynamic NAT

Aim:

The aim of the experiment is to Configure and Implement Dynamic Network Address Translation (NAT).

Procedure:

- i) Add two routers, One switch and two PCs for Dynamic NAT configuration and connect all devices
- ii) Configure TCP/IP configuration of the PCs and assign IP addresses to the interface of the routers as follows and conduct testing.

PC0 : IP address: 192.168.10.10  
Gateway: 192.168.10.1

PC1 : IP address: 192.168.10.20  
Gateway: 192.168.10.1

- iii) Now Configure Dynamic NAT on Router R0 C1 by creating a new NAT Pool and defining access-list and local network to this pool as shown:

Router# ~~en~~ enable

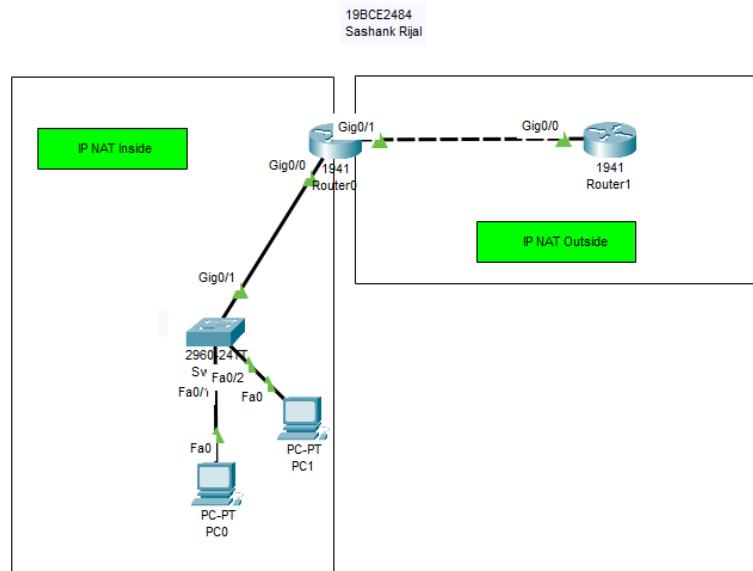
Router# conf t

Router(config)# interface gigabitEthernet 0/0

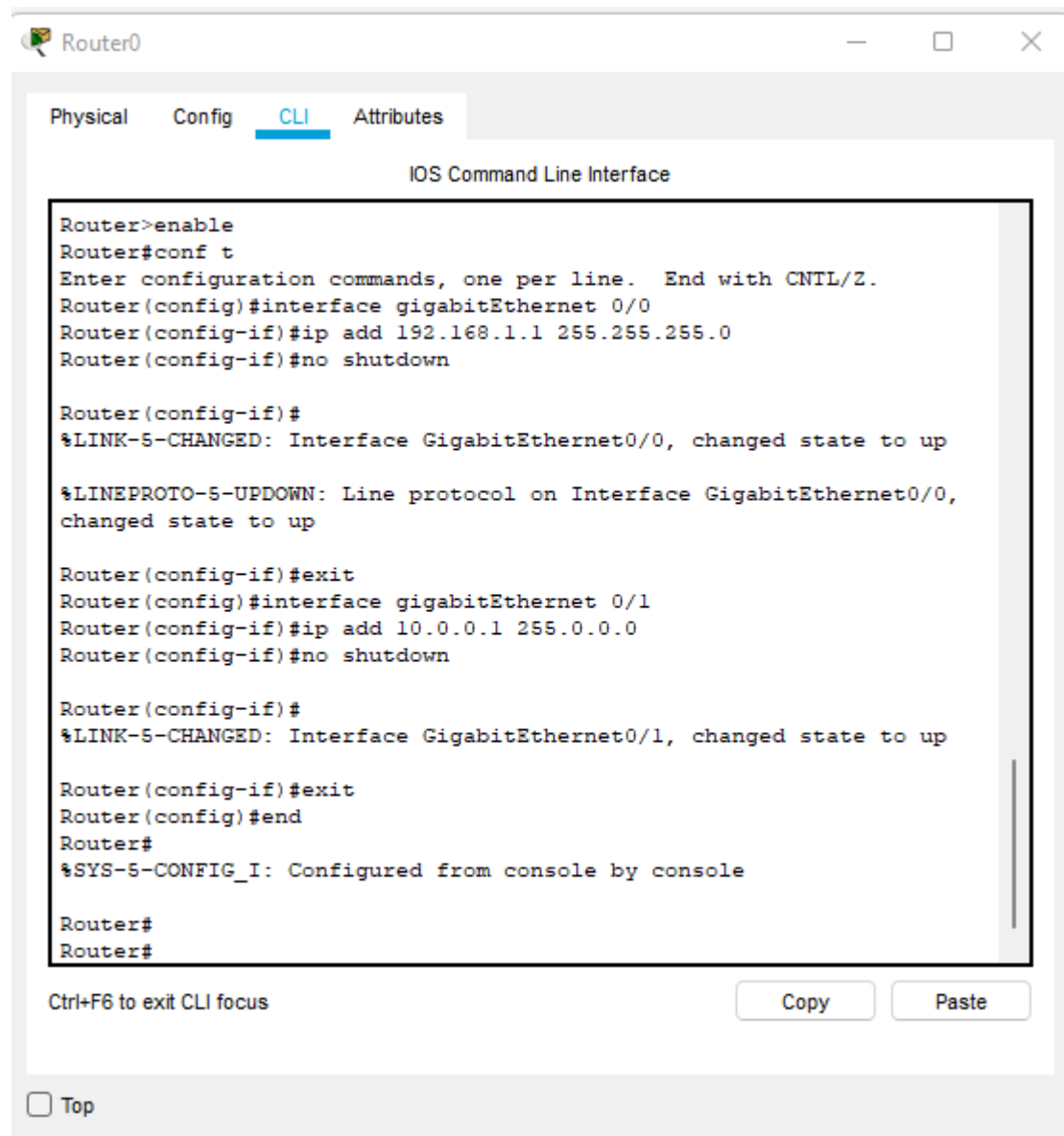
```
Router (config-if) # ip address 192.168.10.1 255.255.255.0
Router (config-if) # ip nat inside
Router (config-if) # no shutdown
Router (config-if) # exit
Router (config-if) # interface gigabitEthernet 0/1
Router (config-if) # ip address 10.0.0.1 255.0.0.0
Router (config-if) # ip nat outside
Router (config-if) # no shutdown
Router (config-if) # exit
Router (config) # ip nat pool DYNAMICNAT 10.0.0.5
10.0.0.10 netmask 255.0.0.0
Router (config) # ip access-list 1 permit 192.168.10.0
0.0.0.255
Router (config) # ip nat inside source list 1 pool DYNAMIC
NAT
Router (config) # end
Router # wr
```

- iv) After configuring Dynamic NAT, test the connection from PC0/PC1 to Router1 serial interface 10.0.0.2, the process will be successful.
- v) On Router0, we can examine the NAT records after pinging by executing the show ip nat translations command.
- vi) As, seen in my lab report, the 192.168.10.20 IP address has been translated into the global 10.0.0.5 IP address in the NAT pool.

# Network Design:



## Configuring router:



The screenshot shows a window titled "Router0" with a tabbed interface. The "CLI" tab is selected, displaying the "IOS Command Line Interface". The terminal output shows the following sequence of commands and responses:

```
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip add 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-S-CHANGED: Interface GigabitEthernet0/0, changed state to up

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

Router(config-if)#exit
Router(config)#interface gigabitEthernet 0/1
Router(config-if)#ip add 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-S-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#end
Router#
%SYS-S-CONFIG_I: Configured from console by console

Router#
Router#
```

Below the terminal output, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". At the bottom left of the window, there is a checkbox labeled "Top".



Router1



Physical

Config

CLI

Attributes

## IOS Command Line Interface

Would you like to enter the initial configuration dialog? [yes/no]:  
no

Press RETURN to get started!

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface gigabitEthernet 0/0

Router(config-if)#ip add 10.0.0.2 255.0.0.0

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

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

Router(config-if)#exit

Router(config)#end

Router#

%SYS-5-CONFIG\_I: Configured from console by console

Router#

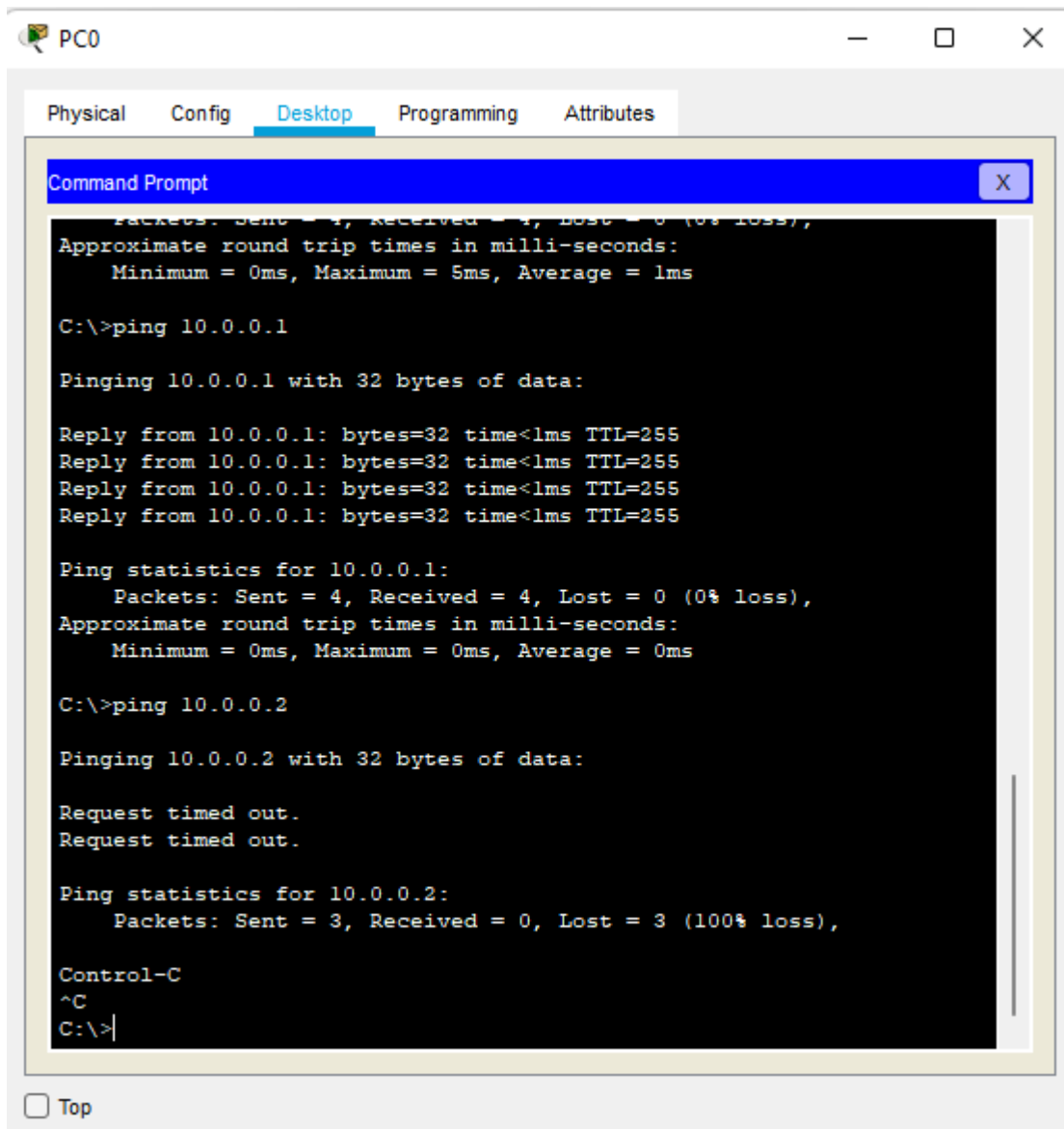
Ctrl+F6 to exit CLI focus

Copy

Paste

☐ Top

## Pinging PC (pre-configuration):



The screenshot shows a Packet Tracer window for PC0. The 'Desktop' tab is active, displaying a Command Prompt window. The Command Prompt shows the results of two ping commands. The first command, 'ping 10.0.0.1', shows successful results with 4 packets sent, 4 received, and 0% loss. The second command, 'ping 10.0.0.2', shows failed results with 3 packets sent, 0 received, and 100% loss. The Command Prompt window has a blue title bar and a close button. The Packet Tracer window has a title bar with 'PC0' and standard window controls. The 'Desktop' tab is highlighted in the top navigation bar.

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 0ms, Maximum = 5ms, Average = 1ms

C:\>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time<1ms TTL=255
Reply from 10.0.0.1: bytes=32 time<1ms TTL=255
Reply from 10.0.0.1: bytes=32 time<1ms TTL=255
Reply from 10.0.0.1: bytes=32 time<1ms TTL=255

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.0.0.2

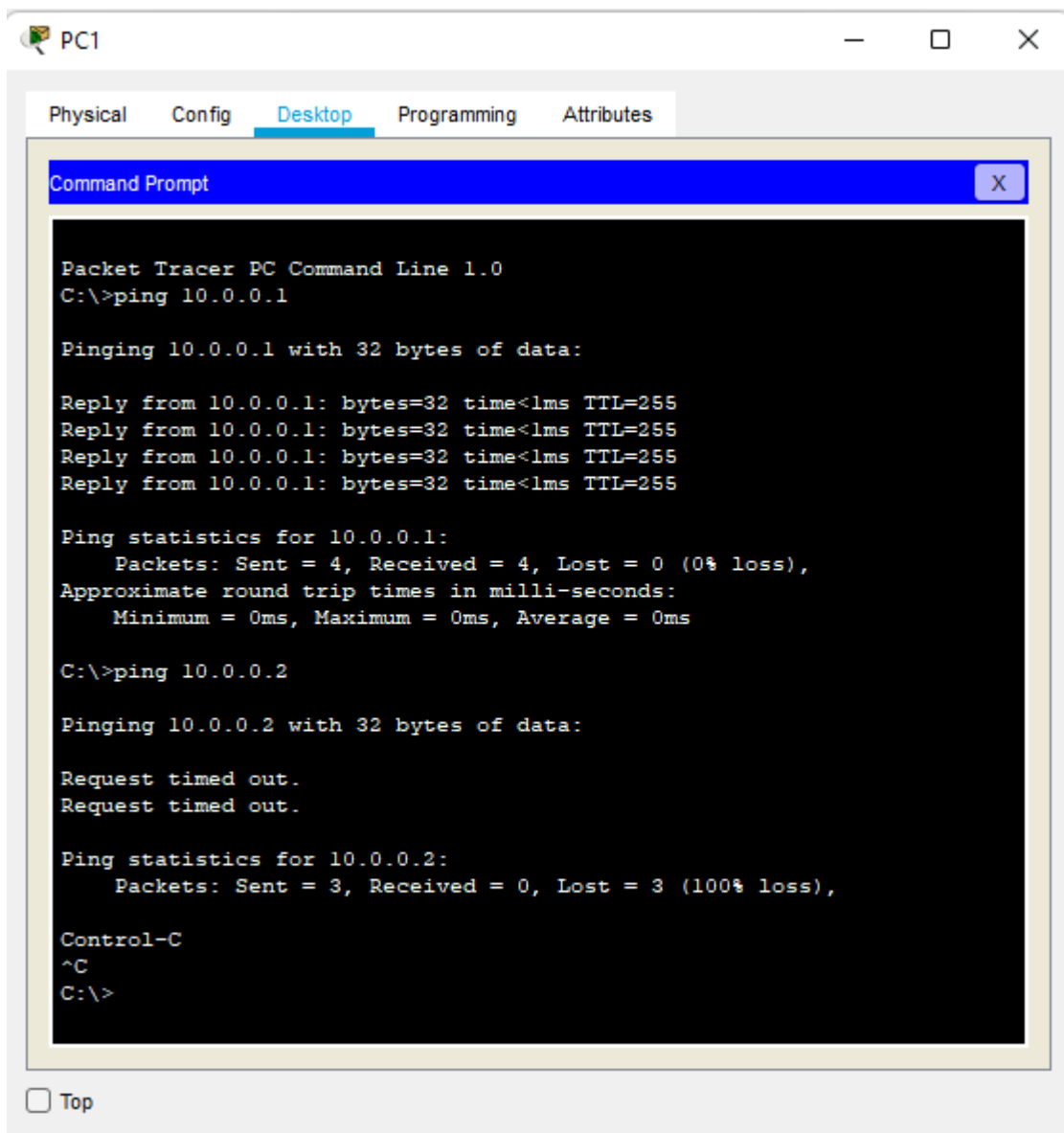
Pinging 10.0.0.2 with 32 bytes of data:

Request timed out.
Request timed out.

Ping statistics for 10.0.0.2:
    Packets: Sent = 3, Received = 0, Lost = 3 (100% loss),

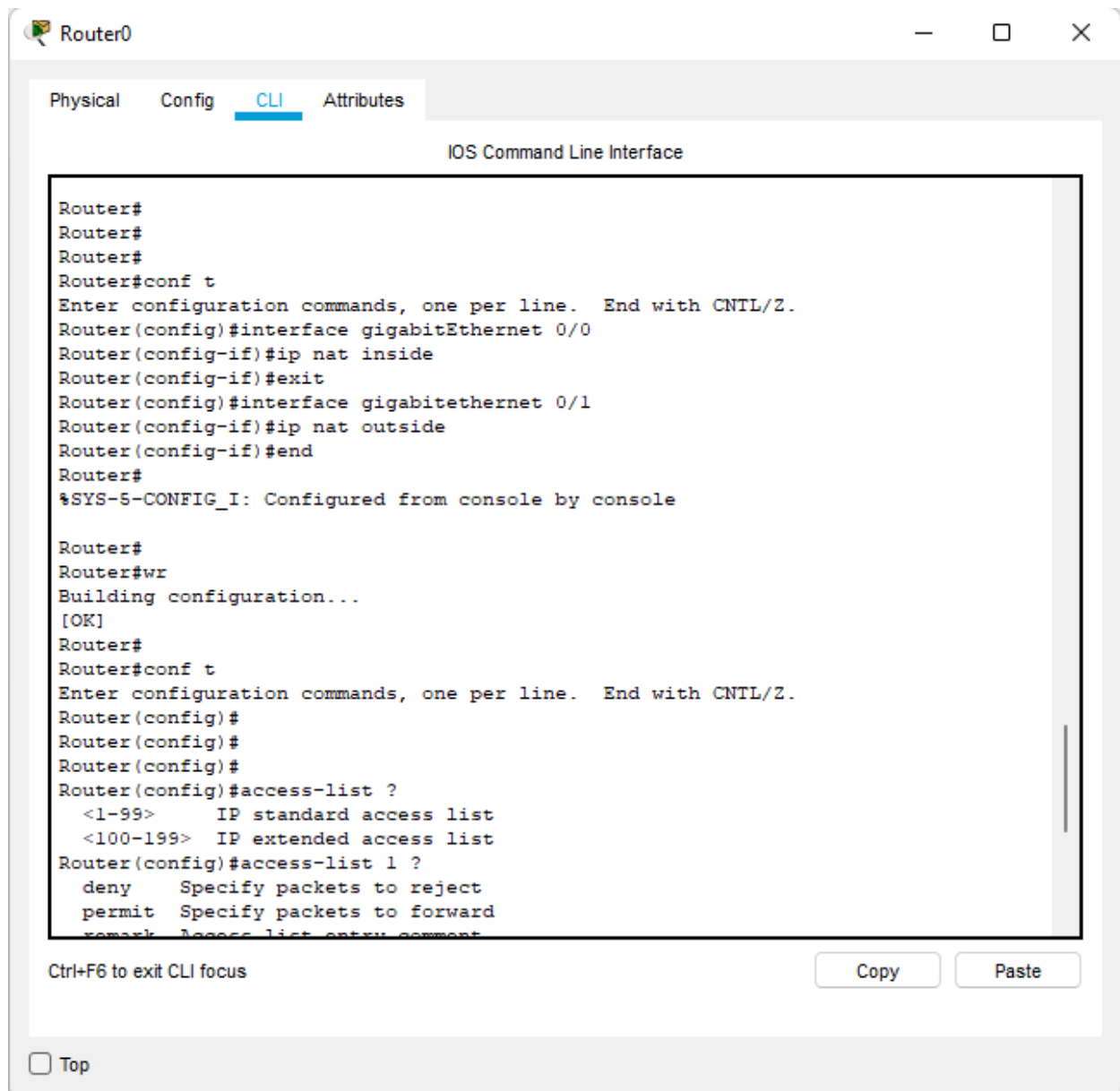
Control-C
^C
C:\>
```

☐ Top





## Configuration of Dynamic NAT:



The screenshot shows a Cisco Router CLI interface with the following tabs: Physical, Config, CLI (selected), and Attributes. The main window displays the IOS Command Line Interface. The configuration process is as follows:

```
Router#
Router#
Router#
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#interface gigabitEthernet 0/1
Router(config-if)#ip nat outside
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
Router#wr
Building configuration...
[OK]
Router#
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#
Router(config)#access-list ?
<1-99>      IP standard access list
<100-199>   IP extended access list
Router(config)#access-list 1 ?
deny        Specify packets to reject
permit      Specify packets to forward
remark      Access list entry comment
```

At the bottom of the CLI window, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste".

☐ Top

## IOS Command Line Interface

```
Router(config)#
Router(config)#
Router(config)#
Router(config)#access-list ?
<1-99>      IP standard access list
<100-199>   IP extended access list
Router(config)#access-list 1 ?
deny        Specify packets to reject
permit      Specify packets to forward
remark      Access list entry comment
Router(config)#access-list 1 permit ?
A.B.C.D     Address to match
any         Any source host
host        A single host address
Router(config)#access-list 1 permit 192.168.10.0 0.0.0.255
Router(config)#
Router(config)#
Router(config)#ip nat ?
inside      Inside address translation
outside     Outside address translation
pool        Define pool of addresses
Router(config)#ip nat pool ?
WORD        Pool name
Router(config)#ip nat pool DYNAMICNAT 10.0.0.5 10.0.0.10 netmask 255.0.0.0
Router(config)#ip nat inside source list 1 pool DYNAMICNAT
Router(config)#
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

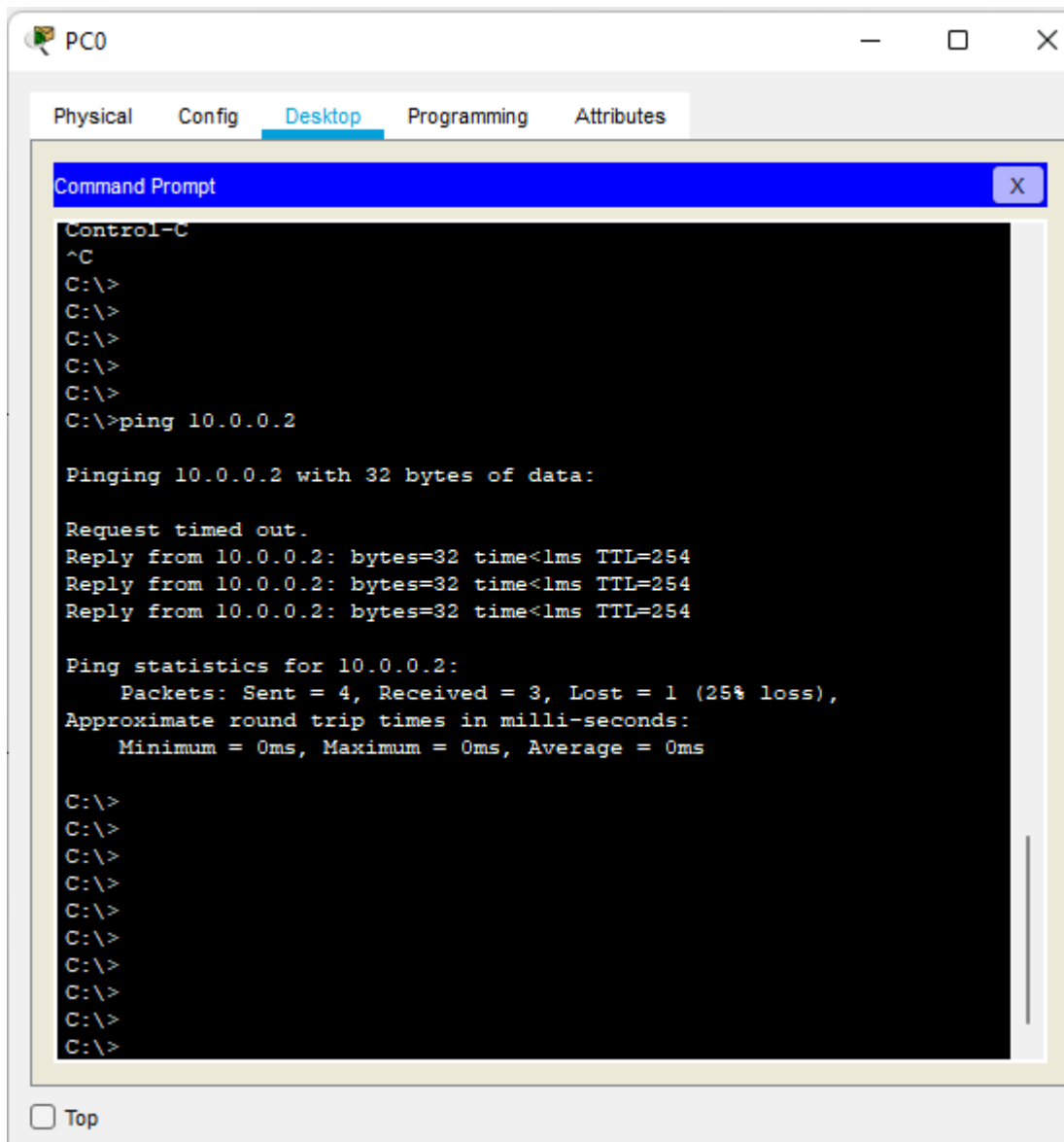
Router#|
```

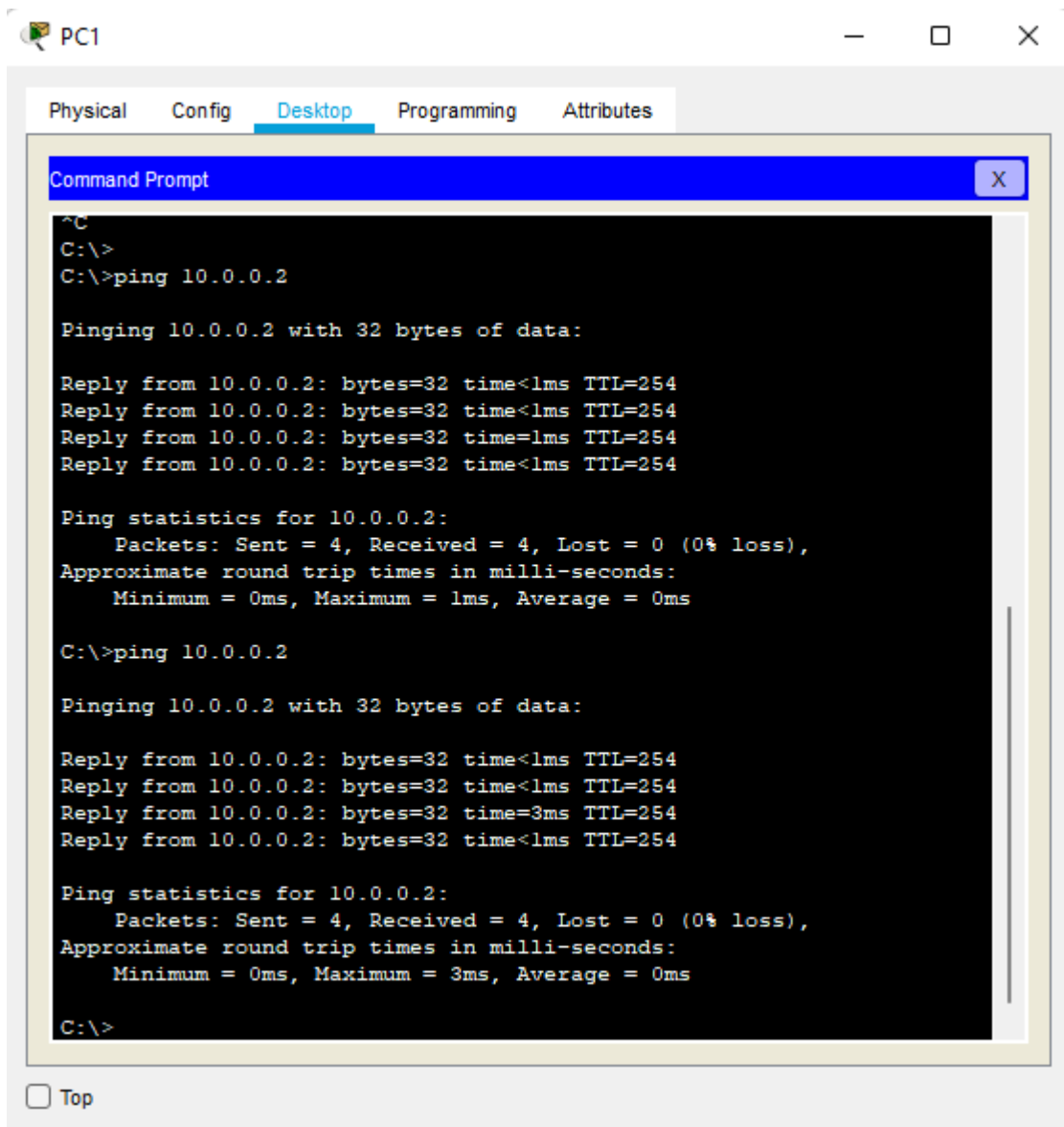
Ctrl+F6 to exit CLI focus

Copy

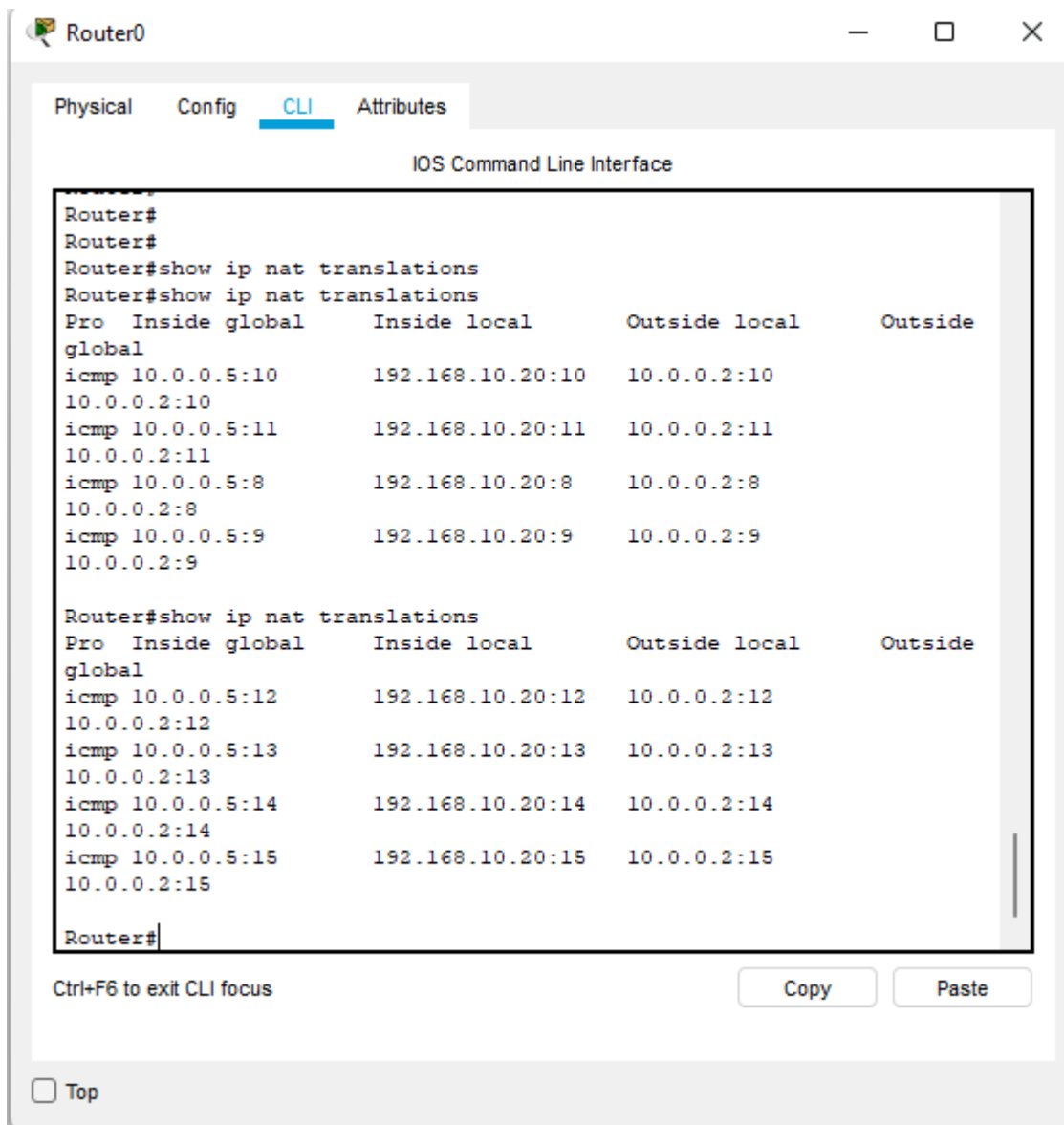
Paste

## Pinging PC (Post – configuration):





## Viewing NAT translations in CLI:



```
Router#  
Router#  
Router#show ip nat translations  
Router#show ip nat translations  
Pro Inside global      Inside local      Outside local      Outside  
global  
icmp 10.0.0.5:10        192.168.10.20:10  10.0.0.2:10  
10.0.0.2:10  
icmp 10.0.0.5:11        192.168.10.20:11  10.0.0.2:11  
10.0.0.2:11  
icmp 10.0.0.5:8         192.168.10.20:8   10.0.0.2:8  
10.0.0.2:8  
icmp 10.0.0.5:9         192.168.10.20:9   10.0.0.2:9  
10.0.0.2:9  
  
Router#show ip nat translations  
Pro Inside global      Inside local      Outside local      Outside  
global  
icmp 10.0.0.5:12        192.168.10.20:12  10.0.0.2:12  
10.0.0.2:12  
icmp 10.0.0.5:13        192.168.10.20:13  10.0.0.2:13  
10.0.0.2:13  
icmp 10.0.0.5:14        192.168.10.20:14  10.0.0.2:14  
10.0.0.2:14  
icmp 10.0.0.5:15        192.168.10.20:15  10.0.0.2:15  
10.0.0.2:15  
Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

## Conclusion:

Therefore, Dynamic NAT was successfully implemented in cisco packet tracer where NAT translations are shown.