

LINUX NETWORKING MODULE 5 ASSESSMENT SOLUTION

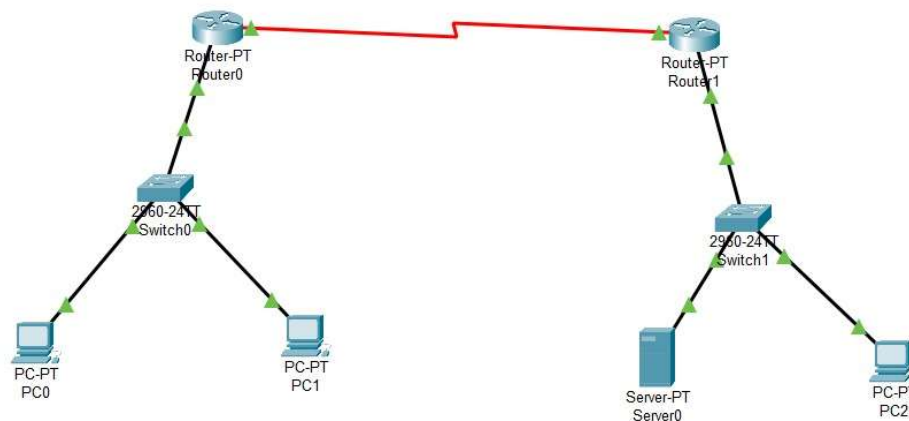
-BY SAKTHI KUMAR S

7) In Cisco Packet Tracer, create a small network with multiple devices. Use private IP addresses on the PCs and configure the router to perform NAT to allow the PCs to access the internet

- Task: Test the NAT configuration by pinging an external IP address from the PCs and capture the traffic.
- What is the source IP address before and after NAT?

- **Private Network:** Uses IP addresses in the 20.x.x.x range.
- **Public Network:** Uses IP addresses in the 10.x.x.x range.
- NAT will be configured on **Router** to enable private-to-public communication.

Topology:



IP configuration:

PC0

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address20.20.20.2

Subnet Mask255.0.0.0

Default Gateway20.20.20.1

DNS Server0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local AddressFE80::203:EAF:FEED:4D70

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

AuthenticationMD5

Username

Password

PC1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address20.20.20.1

Subnet Mask255.0.0.0

Default Gateway20.20.20.0

DNS Server0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local AddressFE80::2E0:F9FF:FECC:D12C

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

AuthenticationMD5

Username

Password

Server0

Physical Config Services Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address10.10.10.2

Subnet Mask255.0.0.0

Default Gateway10.10.10.0

DNS Server0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local AddressFE80::2E0:F7FF:FE40:AA32

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

AuthenticationMD5

Username

Password

PC2

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address10.10.10.1

Subnet Mask255.0.0.0

Default Gateway10.10.10.0

DNS Server0.0.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local AddressFE80::2D0:58FF:FE0D:298

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

AuthenticationMD5

Username

Password

Router0

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

Duplex

Half Duplex

☒ Full Duplex

MAC Address000C.CF71.439B

IP Configuration

IPv4 Address20.20.20.0

Subnet Mask255.0.0.0

Tx Ring Limit10

Router0

PhysicalConfigCLIAttributes

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

2000000

IP Configuration

IPv4 Address

30.30.30.2

Subnet Mask

255.0.0.0

Tx Ring Limit

10

Router1

PhysicalConfigCLIAttributes

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

Duplex

Half Duplex

Full Duplex

MAC Address

0001.9749.0E4D

IP Configuration

IPv4 Address

10.10.10.0

Subnet Mask

255.255.255.252

Tx Ring Limit

10

Router1

PhysicalConfigCLIAttributes

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

30.30.30.1

Subnet Mask

255.0.0.0

Tx Ring Limit

10

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

Static Routes

Network
Mask
Next Hop

Add







Network Address

20.0.0.0/8 via 30.30.30.2

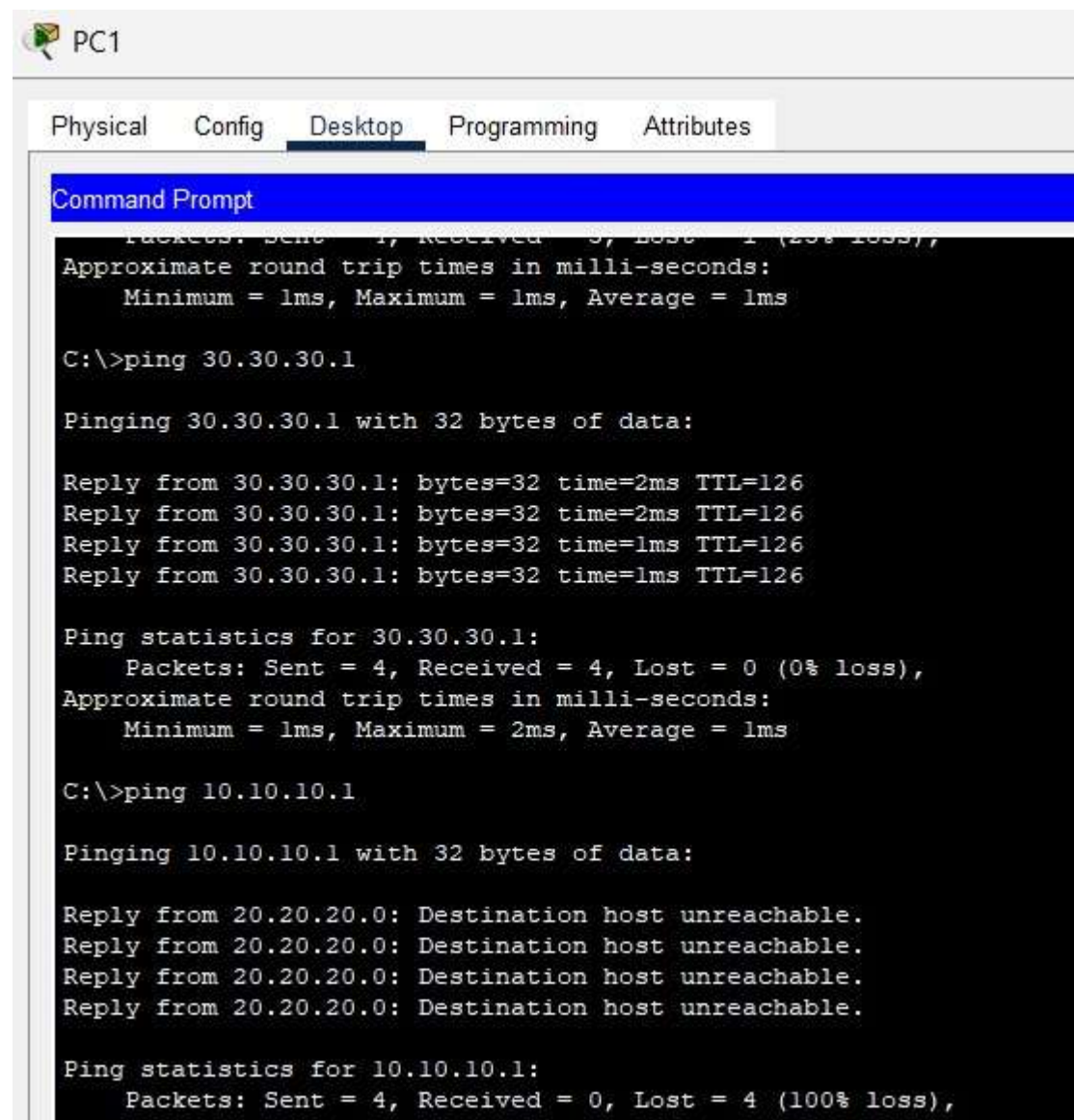
Nat inside and outside configuration:

```
Router(config)#ip nat inside source static 10.10.10.1 30.30.30.1
Router(config)#ip nat inside source static 10.10.10.2 30.30.30.1
Router(config)#
Router(config)#
Router(config)#interface FastEthernet0/0
Router(config-if)#ip nat inside
Router(config-if)#
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#ip nat outside
Router(config-if)#exit
```

Packet transmission Test:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Failed	PC2	PC1	ICMP		0.000	N	7	(edit)	(delete)
	Successful	PC2	PC1	ICMP		0.000	N	8	(edit)	(delete)
	Successful	PC2	PC1	ICMP		0.000	N	9	(edit)	(delete)

Ping test;



The screenshot shows a Packet Tracer PC configuration window for PC1. The 'Desktop' tab is selected, displaying a Command Prompt. The prompt shows the results of a ping test to 30.30.30.1, which was successful with 0% loss. It also shows a failed ping test to 10.10.10.1, which resulted in 100% loss because the destination host was unreachable.

```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
  Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 30.30.30.1

Pinging 30.30.30.1 with 32 bytes of data:

Reply from 30.30.30.1: bytes=32 time=2ms TTL=126
Reply from 30.30.30.1: bytes=32 time=2ms TTL=126
Reply from 30.30.30.1: bytes=32 time=1ms TTL=126
Reply from 30.30.30.1: bytes=32 time=1ms TTL=126

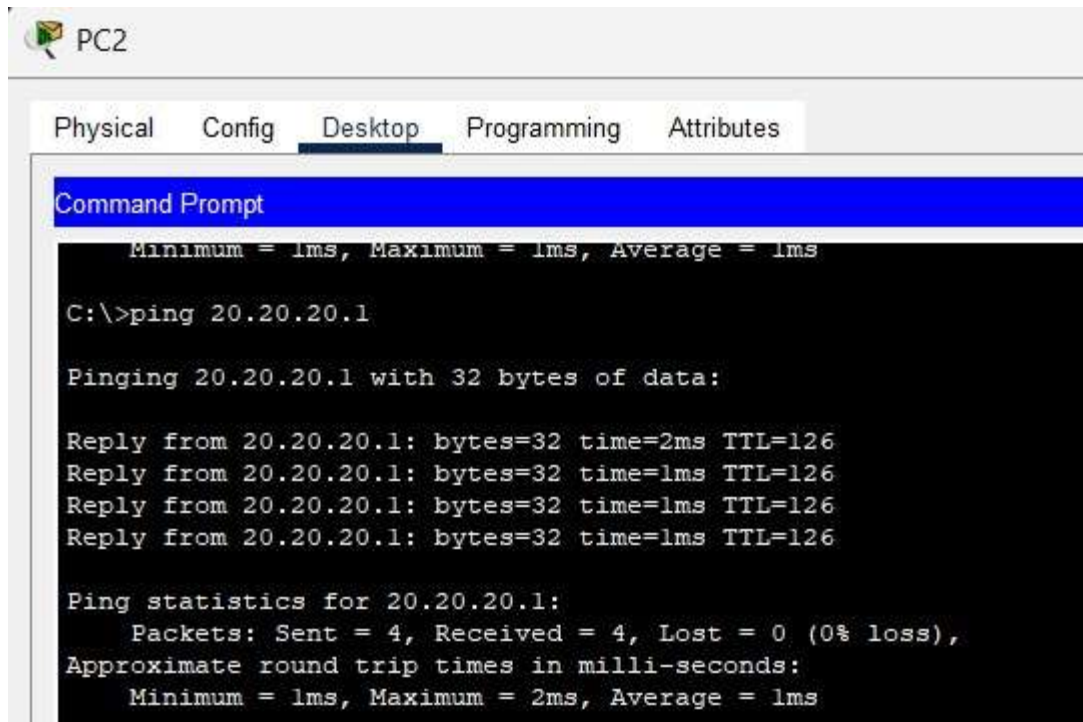
Ping statistics for 30.30.30.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>ping 10.10.10.1

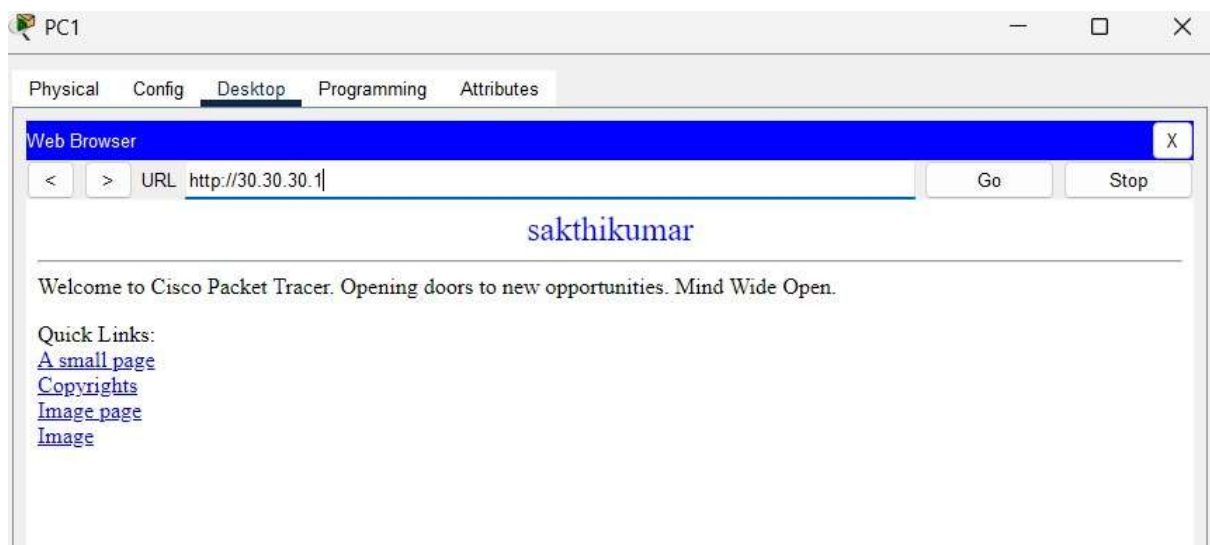
Pinging 10.10.10.1 with 32 bytes of data:

Reply from 20.20.20.0: Destination host unreachable.
Reply from 20.20.20.0: Destination host unreachable.
Reply from 20.20.20.0: Destination host unreachable.
Reply from 20.20.20.0: Destination host unreachable.

Ping statistics for 10.10.10.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```



Server connectivity:



Nat table :

```

Router#show ip nat translations
Pro  Inside global      Inside local      Outside local      Outside global
---  30.30.30.1         10.10.10.2        ---               ---
tcp  30.30.30.1:80      10.10.10.2:80     20.20.20.1:1027   20.20.20.1:1027
tcp  30.30.30.1:80      10.10.10.2:80     20.20.20.1:1028   20.20.20.1:1028
tcp  30.30.30.1:80      10.10.10.2:80     20.20.20.1:1029   20.20.20.1:1029

```

NAT Table for Router1				
Protocol	Inside Global	Inside Local	Outside Local	Outside Global
---	30.30.30.1	10.10.10.1	---	---
---	30.30.30.1	10.10.10.2	---	---
tcp	30.30.30.1:80	10.10.10.2:80	20.20.20.1:1027	20.20.20.1:1027
tcp	30.30.30.1:80	10.10.10.2:80	20.20.20.1:1028	20.20.20.1:1028

These tables shows the transitions of source IP before and after NAT.