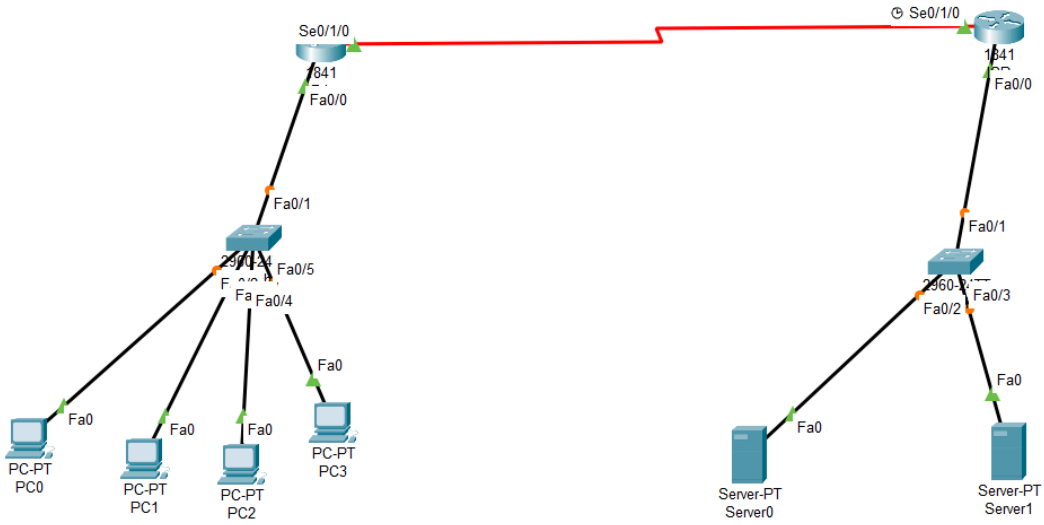
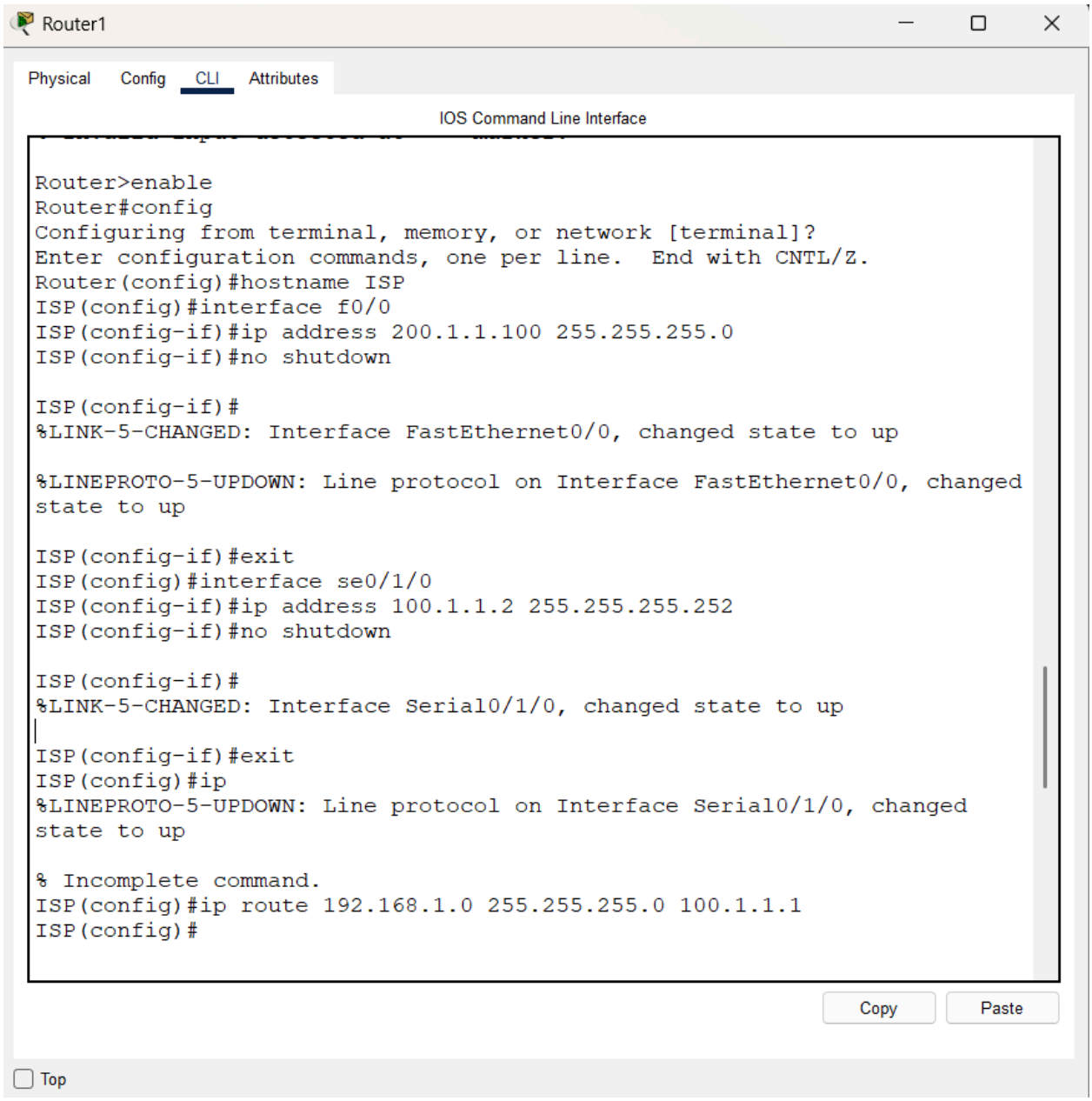
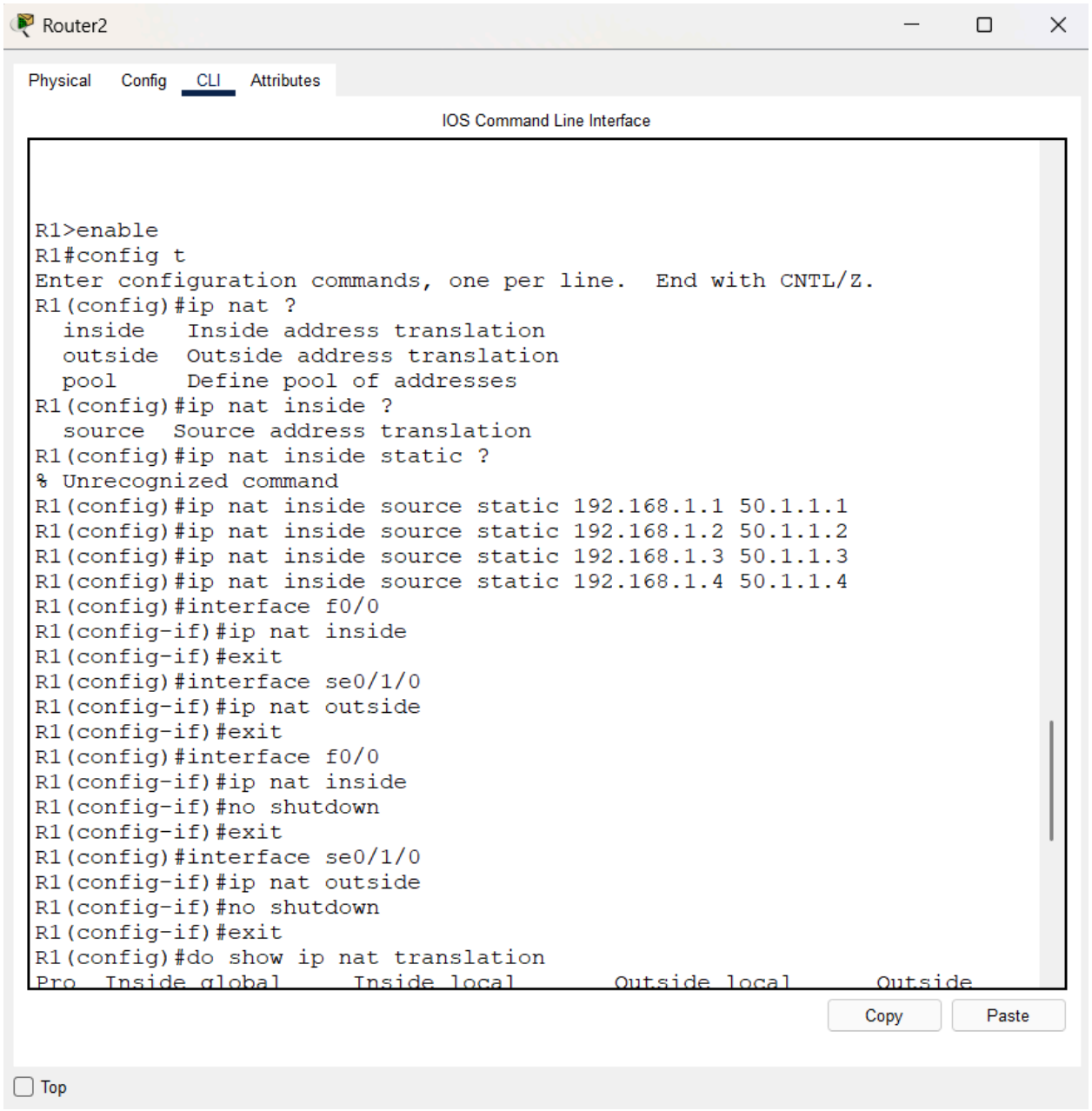
NAT (Network Address Translation)

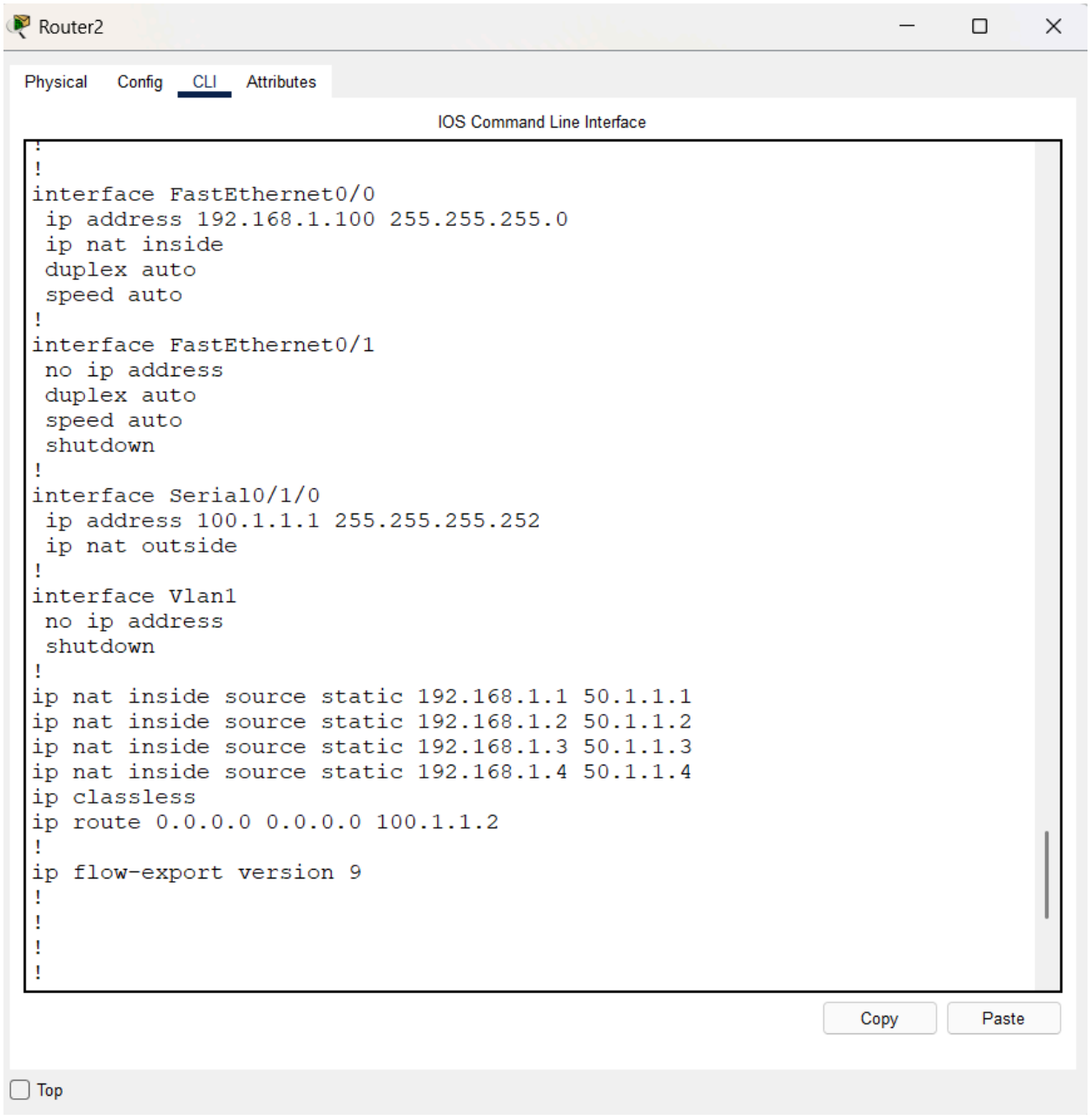


Static NAT

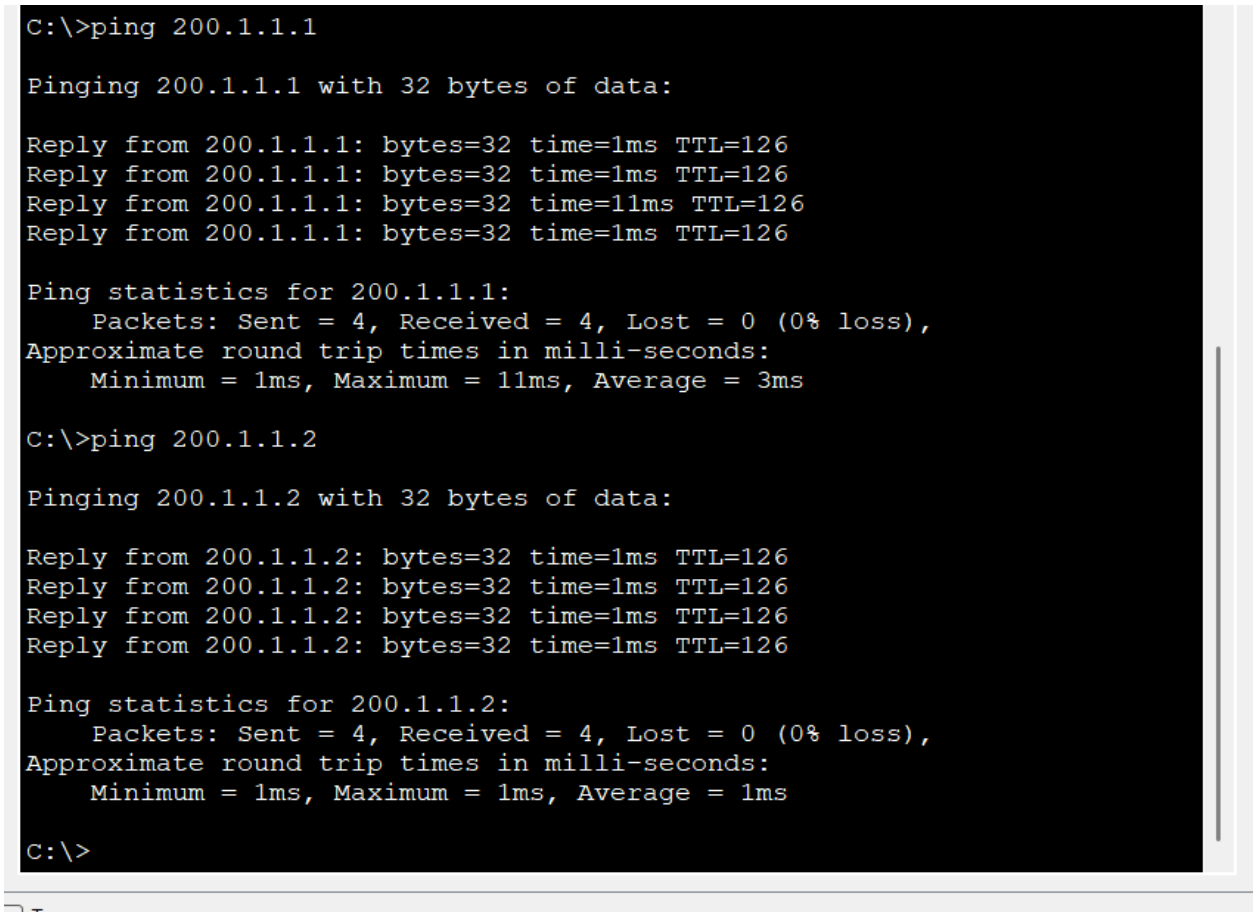

Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname ISP
ISP(config)#interface f0/0
ISP(config-if)#ip address 200.1.1.100 255.255.255.0
ISP(config-if)#no shutdown
ISP(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
ISP(config-if)#exit
ISP(config)#interface se0/1/0
ISP(config-if)#ip address 100.1.1.2 255.255.255.252
ISP(config-if)#no shutdown
ISP(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
ISP(config-if)#exit
ISP(config)#ip
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
% Incomplete command.
ISP(config)#ip route 192.168.1.0 255.255.255.0 100.1.1.1
ISP(config)#
Copy
Paste
Top


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
R1>enable
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip nat ?
  inside   Inside address translation
  outside Outside address translation
  pool   Define pool of addresses
R1(config)#ip nat inside ?
  source Source address translation
R1(config)#ip nat inside static ?
% Unrecognized command
R1(config)#ip nat inside source static 192.168.1.1 50.1.1.1
R1(config)#ip nat inside source static 192.168.1.2 50.1.1.2
R1(config)#ip nat inside source static 192.168.1.3 50.1.1.3
R1(config)#ip nat inside source static 192.168.1.4 50.1.1.4
R1(config)#interface f0/0
R1(config-if)#ip nat inside
R1(config-if)#exit
R1(config)#interface se0/1/0
R1(config-if)#ip nat outside
R1(config-if)#exit
R1(config)#interface f0/0
R1(config-if)#ip nat inside
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#interface se0/1/0
R1(config-if)#ip nat outside
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#do show ip nat translation
Pro Inside global   Inside local   Outside local   Outside
Copy
Paste
Top

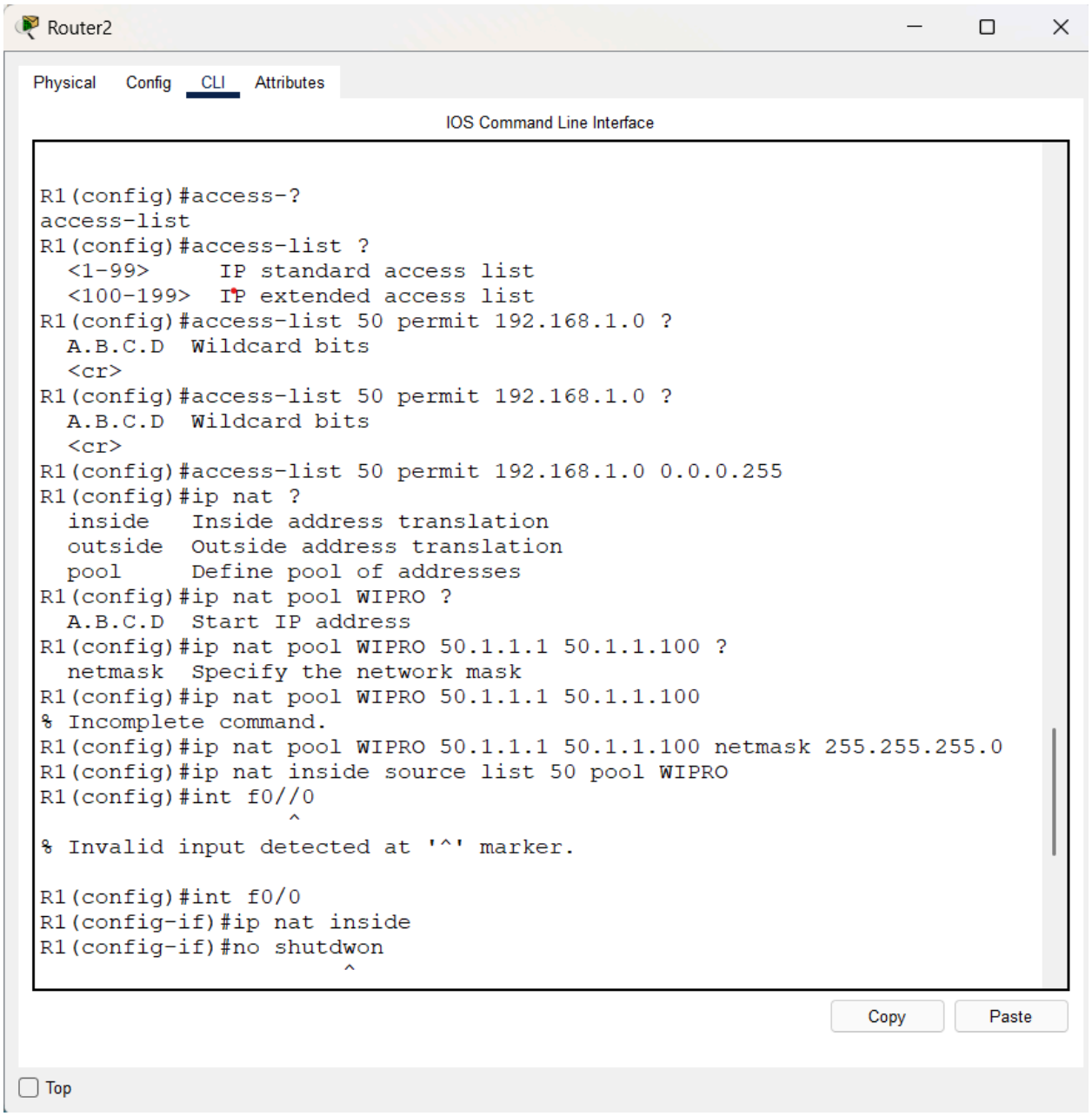
Show run command

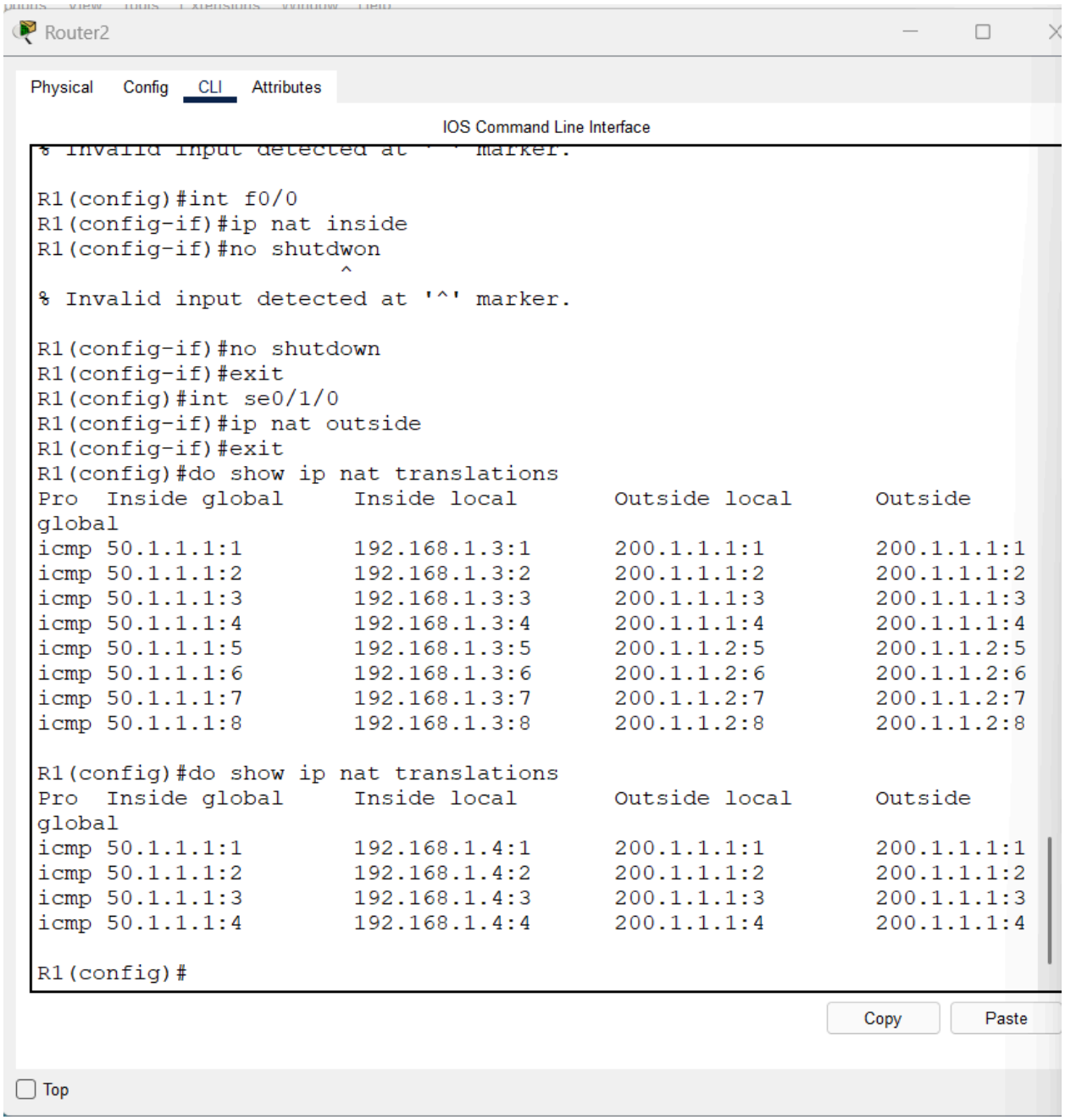


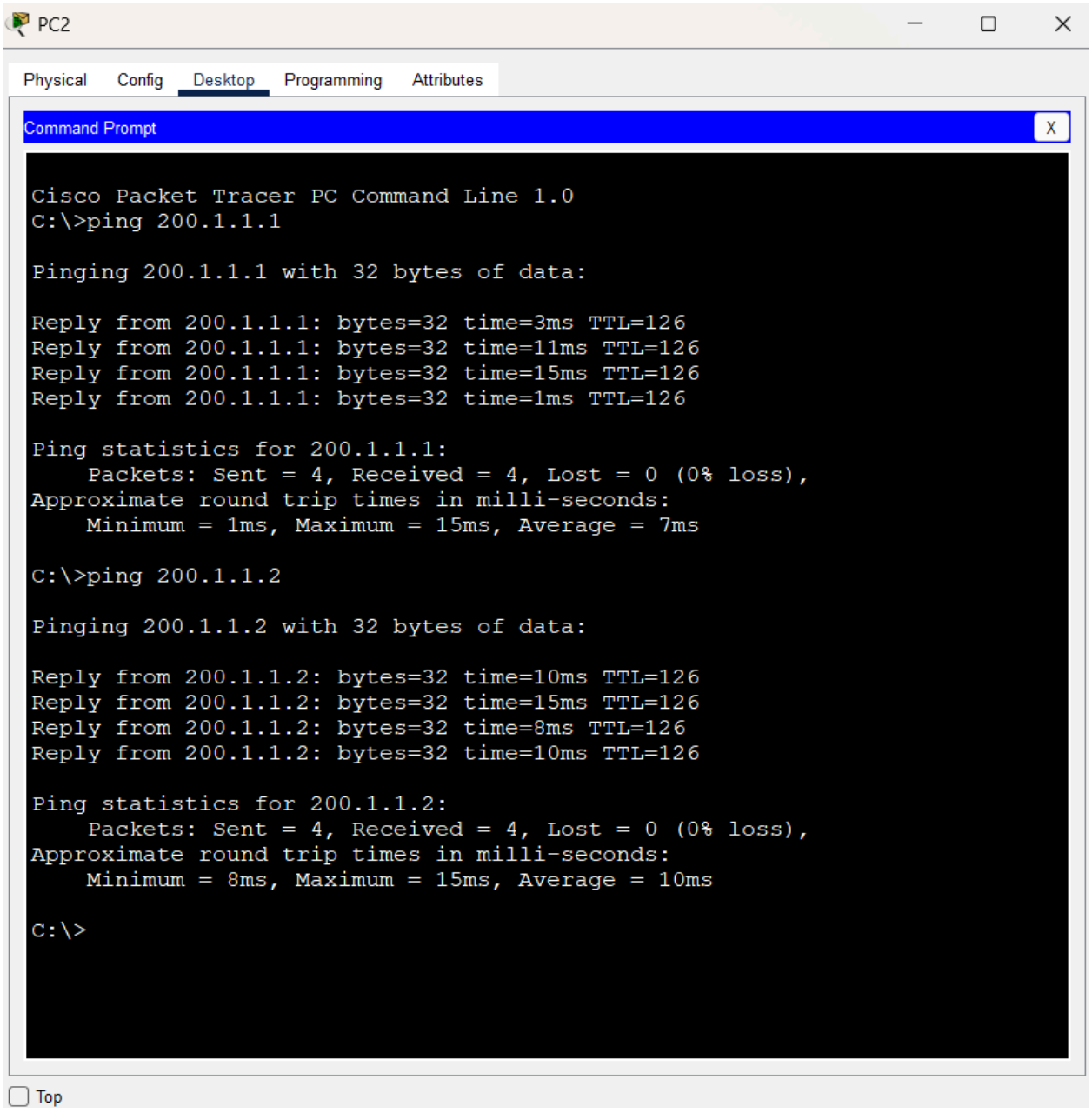
Ping command

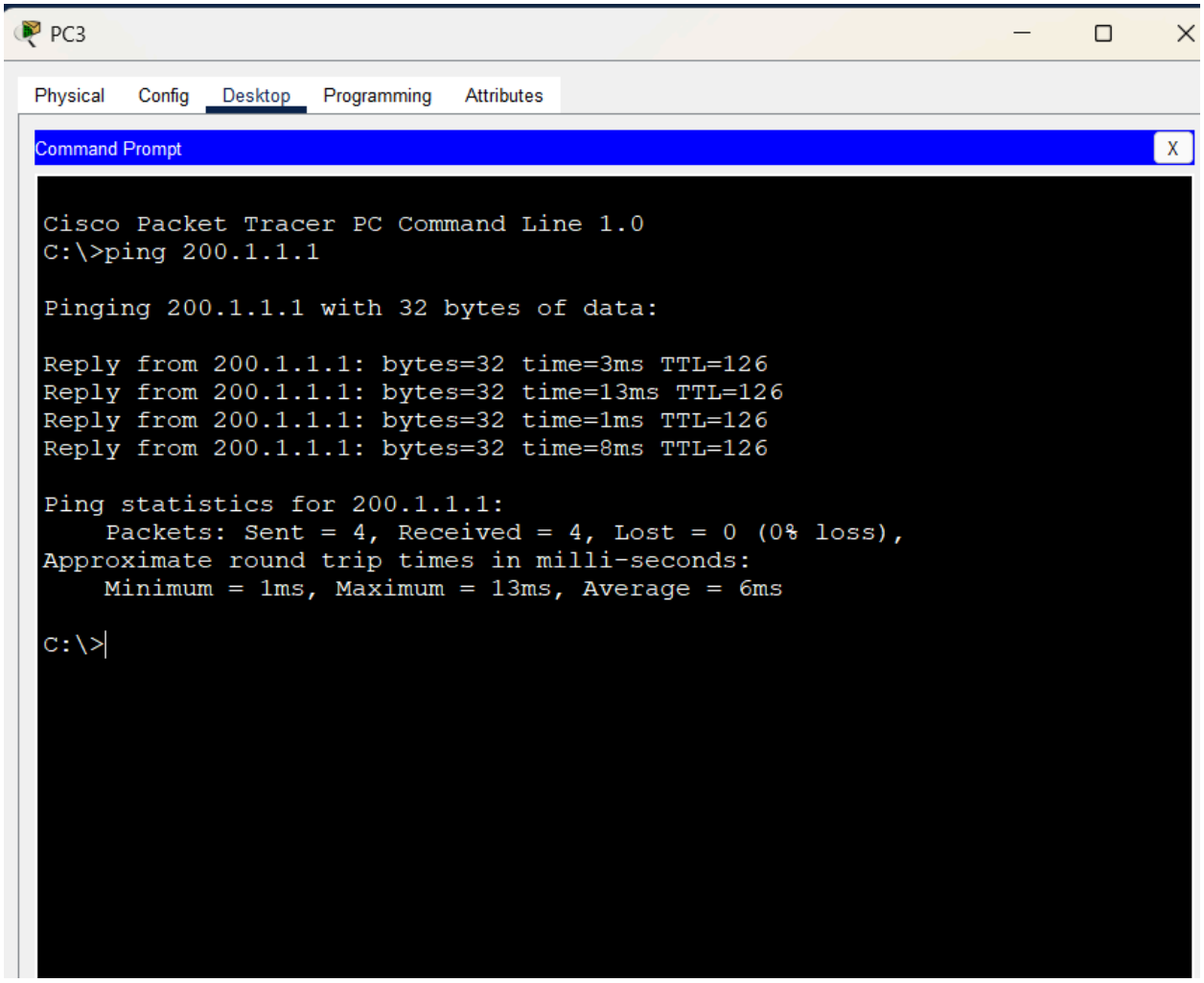


Dynamic NAT

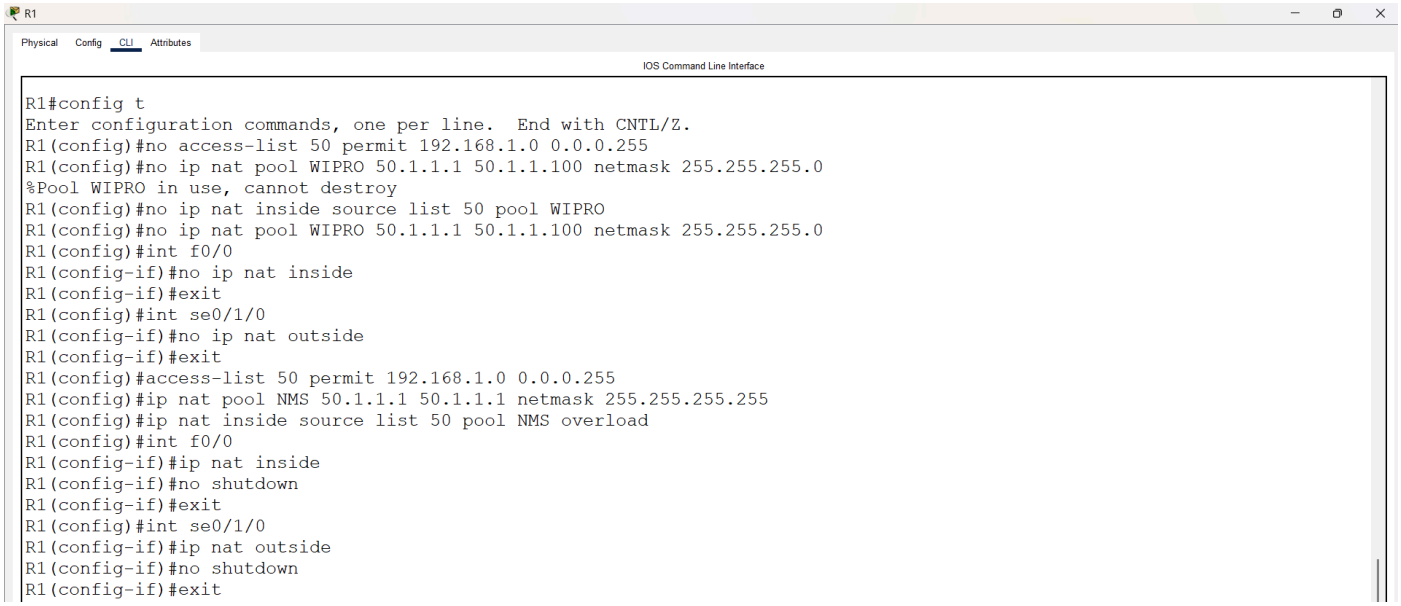

Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
R1(config)#access-?
access-list
R1(config)#access-list ?
<1-99> IP standard access list
<100-199> IP extended access list
R1(config)#access-list 50 permit 192.168.1.0 ?
A.B.C.D Wildcard bits
<cr>
R1(config)#access-list 50 permit 192.168.1.0 ?
A.B.C.D Wildcard bits
<cr>
R1(config)#access-list 50 permit 192.168.1.0 0.0.0.255
R1(config)#ip nat ?
inside Inside address translation
outside Outside address translation
pool Define pool of addresses
R1(config)#ip nat pool WIPRO ?
A.B.C.D Start IP address
R1(config)#ip nat pool WIPRO 50.1.1.1 50.1.1.100 ?
netmask Specify the network mask
R1(config)#ip nat pool WIPRO 50.1.1.1 50.1.1.100
% Incomplete command.
R1(config)#ip nat pool WIPRO 50.1.1.1 50.1.1.100 netmask 255.255.255.0
R1(config)#ip nat inside source list 50 pool WIPRO
R1(config)#int f0//0
^
% Invalid input detected at '^' marker.
R1(config)#int f0/0
R1(config-if)#ip nat inside
R1(config-if)#no shutdwon
^
Copy
Paste
Top


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
% Invalid input detected at '^' marker.
R1(config)#int f0/0
R1(config-if)#ip nat inside
R1(config-if)#no shutdwon
^
% Invalid input detected at '^' marker.
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#int se0/1/0
R1(config-if)#ip nat outside
R1(config-if)#exit
R1(config)#do show ip nat translations
Pro Inside global Inside local Outside local Outside global
icmp 50.1.1.1:1 192.168.1.3:1 200.1.1.1:1 200.1.1.1:1
icmp 50.1.1.1:2 192.168.1.3:2 200.1.1.1:2 200.1.1.1:2
icmp 50.1.1.1:3 192.168.1.3:3 200.1.1.1:3 200.1.1.1:3
icmp 50.1.1.1:4 192.168.1.3:4 200.1.1.1:4 200.1.1.1:4
icmp 50.1.1.1:5 192.168.1.3:5 200.1.1.2:5 200.1.1.2:5
icmp 50.1.1.1:6 192.168.1.3:6 200.1.1.2:6 200.1.1.2:6
icmp 50.1.1.1:7 192.168.1.3:7 200.1.1.2:7 200.1.1.2:7
icmp 50.1.1.1:8 192.168.1.3:8 200.1.1.2:8 200.1.1.2:8
R1(config)#do show ip nat translations
Pro Inside global Inside local Outside local Outside global
icmp 50.1.1.1:1 192.168.1.4:1 200.1.1.1:1 200.1.1.1:1
icmp 50.1.1.1:2 192.168.1.4:2 200.1.1.1:2 200.1.1.1:2
icmp 50.1.1.1:3 192.168.1.4:3 200.1.1.1:3 200.1.1.1:3
icmp 50.1.1.1:4 192.168.1.4:4 200.1.1.1:4 200.1.1.1:4
R1(config)#
Copy
Paste
Top


PC2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 200.1.1.1
Pinging 200.1.1.1 with 32 bytes of data:
Reply from 200.1.1.1: bytes=32 time=3ms TTL=126
Reply from 200.1.1.1: bytes=32 time=11ms TTL=126
Reply from 200.1.1.1: bytes=32 time=15ms TTL=126
Reply from 200.1.1.1: bytes=32 time=1ms TTL=126
Ping statistics for 200.1.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 15ms, Average = 7ms
C:\>ping 200.1.1.2
Pinging 200.1.1.2 with 32 bytes of data:
Reply from 200.1.1.2: bytes=32 time=10ms TTL=126
Reply from 200.1.1.2: bytes=32 time=15ms TTL=126
Reply from 200.1.1.2: bytes=32 time=8ms TTL=126
Reply from 200.1.1.2: bytes=32 time=10ms TTL=126
Ping statistics for 200.1.1.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 8ms, Maximum = 15ms, Average = 10ms
C:\>
Top



PAT (Port Address Translation)



Show ip Nat translations

```
R1(config)#do show ip nat tra
Pro  Inside global     Inside local       Outside local      Outside global
icmp 50.1.1.1:10       192.168.1.3:10     200.1.1.2:10       200.1.1.2:10
icmp 50.1.1.1:11       192.168.1.3:11     200.1.1.2:11       200.1.1.2:11
icmp 50.1.1.1:12       192.168.1.3:12     200.1.1.2:12       200.1.1.2:12
icmp 50.1.1.1:5        192.168.1.4:5      200.1.1.1:5        200.1.1.1:5
icmp 50.1.1.1:6        192.168.1.4:6      200.1.1.1:6        200.1.1.1:6
icmp 50.1.1.1:7        192.168.1.4:7      200.1.1.1:7        200.1.1.1:7
icmp 50.1.1.1:8        192.168.1.4:8      200.1.1.1:8        200.1.1.1:8
icmp 50.1.1.1:9        192.168.1.3:9      200.1.1.2:9        200.1.1.2:9

R1(config)#
```

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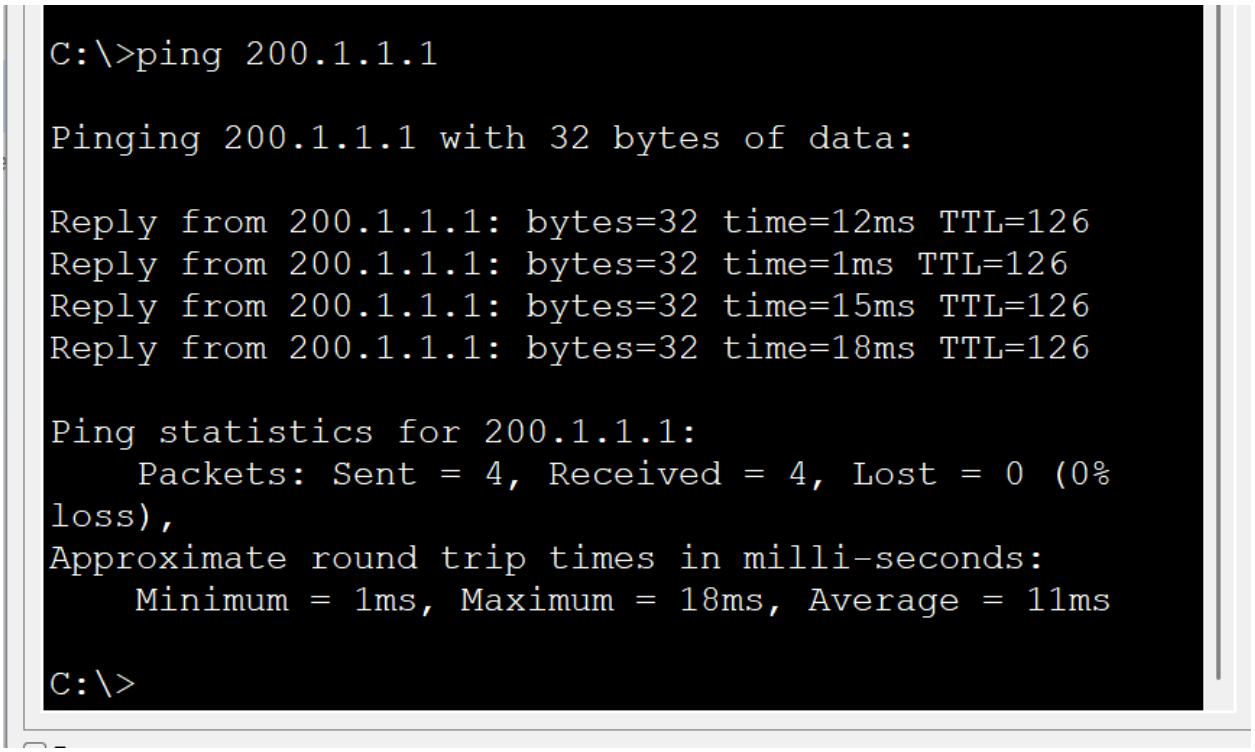
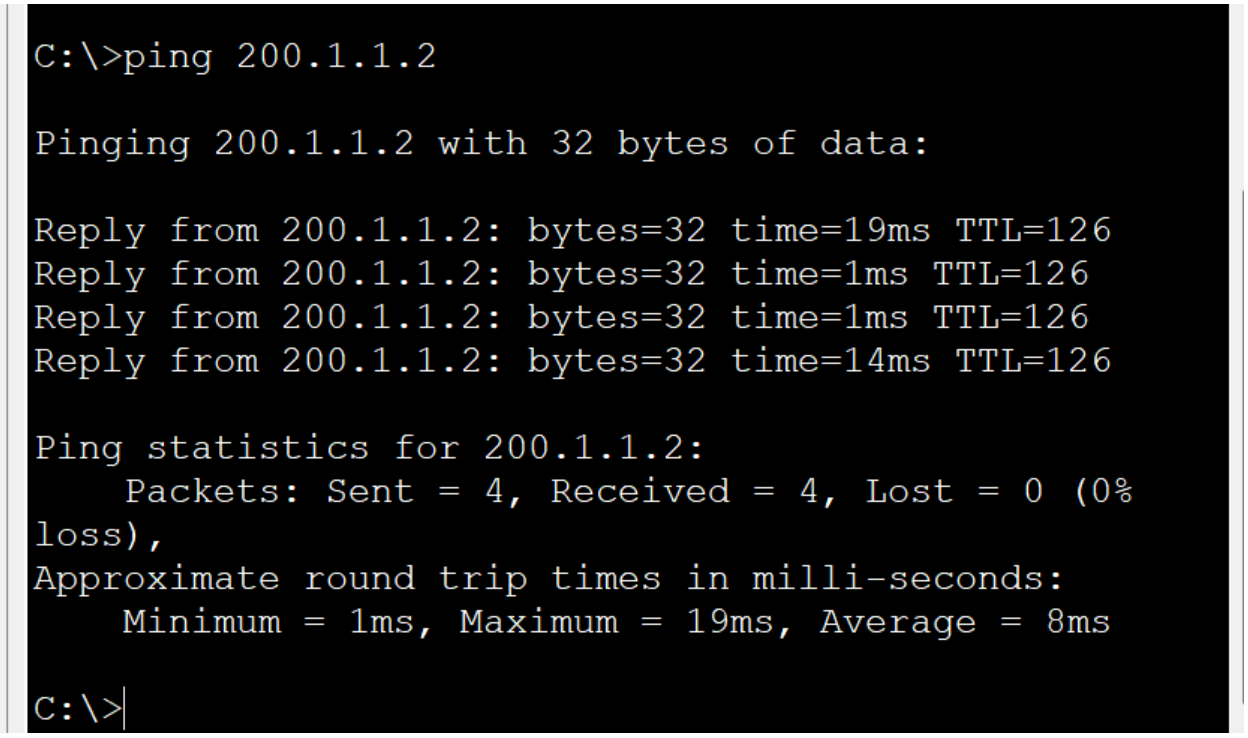
Do show run command

IOS Command Line Interface

```
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/1/0
 ip address 100.1.1.1 255.255.255.252
 ip nat outside
!
interface Vlan1
 no ip address
 shutdown
!
ip nat pool NMS 50.1.1.1 50.1.1.1 netmask 255.255.255.255
ip nat inside source list 50 pool NMS overload
ip classless
ip route 0.0.0.0 0.0.0.0 100.1.1.2
!
ip flow-export version 9
!
!
access-list 50 permit 192.168.1.0 0.0.0.255
!
!
```


C:\>ping 200.1.1.1
Pinging 200.1.1.1 with 32 bytes of data:
Reply from 200.1.1.1: bytes=32 time=12ms TTL=126
Reply from 200.1.1.1: bytes=32 time=1ms TTL=126
Reply from 200.1.1.1: bytes=32 time=15ms TTL=126
Reply from 200.1.1.1: bytes=32 time=18ms TTL=126
Ping statistics for 200.1.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 18ms, Average = 11ms
C:\>


C:\>ping 200.1.1.2
Pinging 200.1.1.2 with 32 bytes of data:
Reply from 200.1.1.2: bytes=32 time=19ms TTL=126
Reply from 200.1.1.2: bytes=32 time=1ms TTL=126
Reply from 200.1.1.2: bytes=32 time=1ms TTL=126
Reply from 200.1.1.2: bytes=32 time=14ms TTL=126
Ping statistics for 200.1.1.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 19ms, Average = 8ms
C:\>