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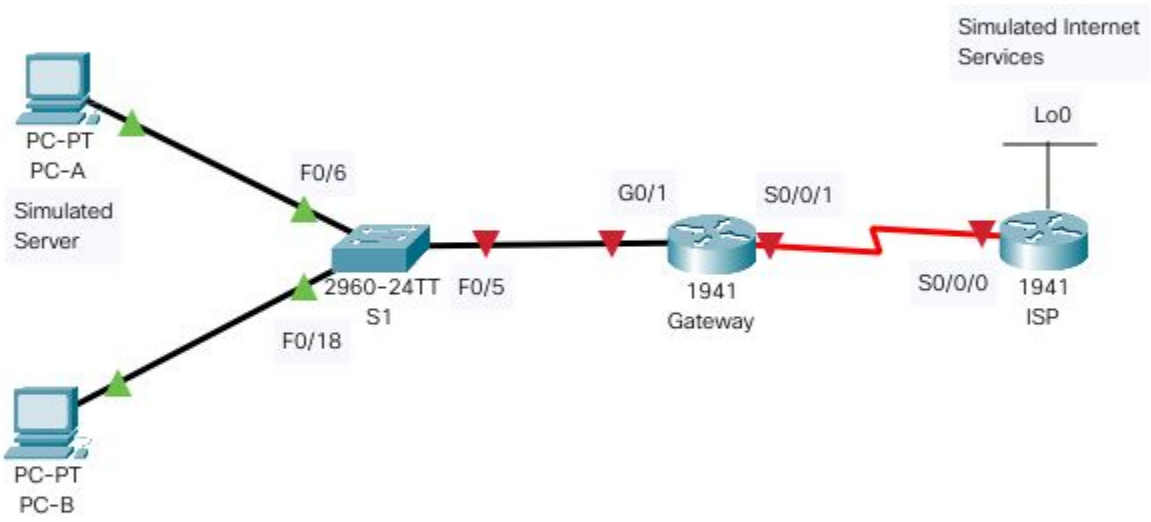
Batch A
Group 2

DCCN LAB ISE

Configuring Dynamic and Static NAT

Part 1 : Build the Network and Verify Connectivity

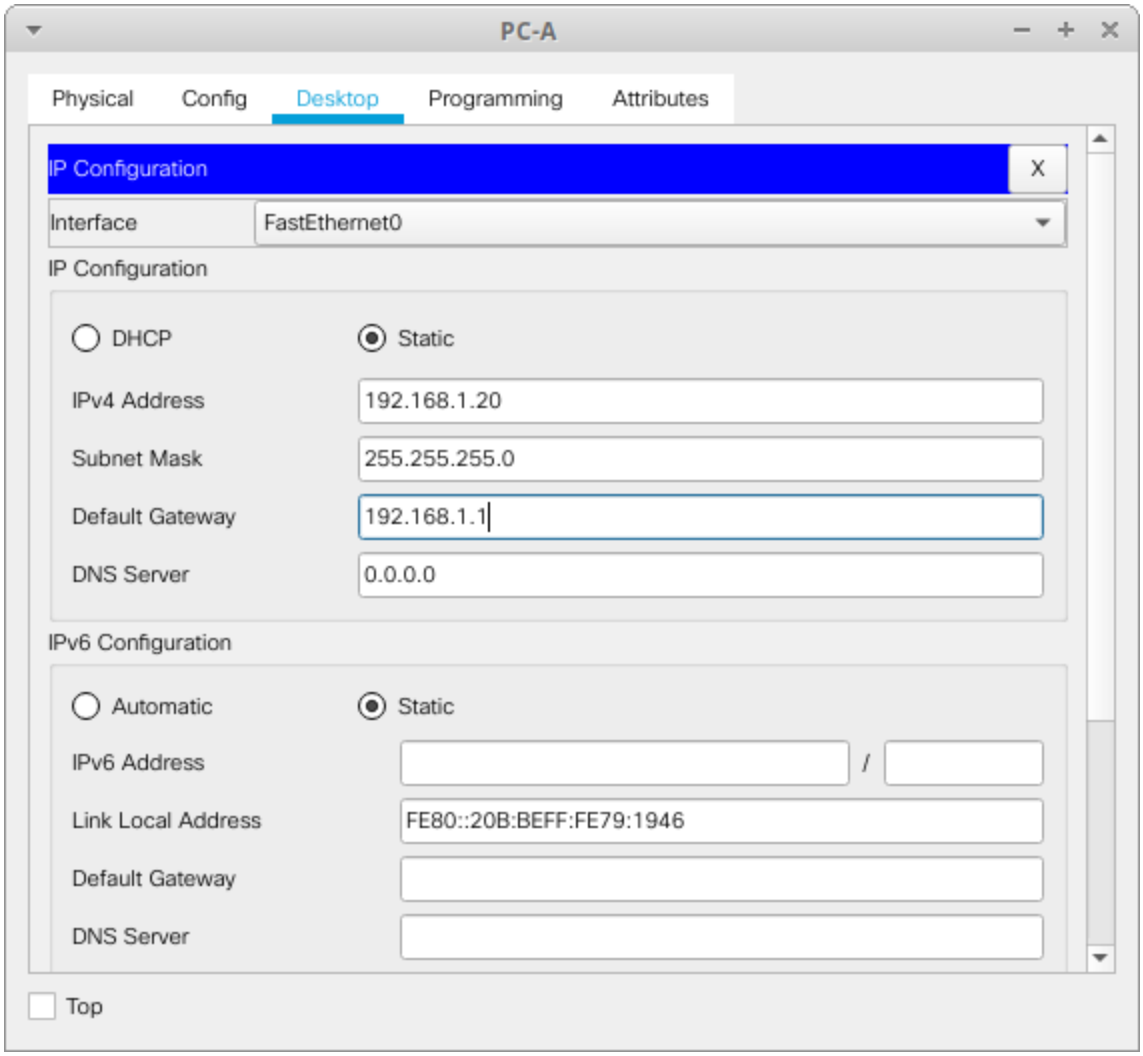
Step 1 : Cable the network as shown in the topology.



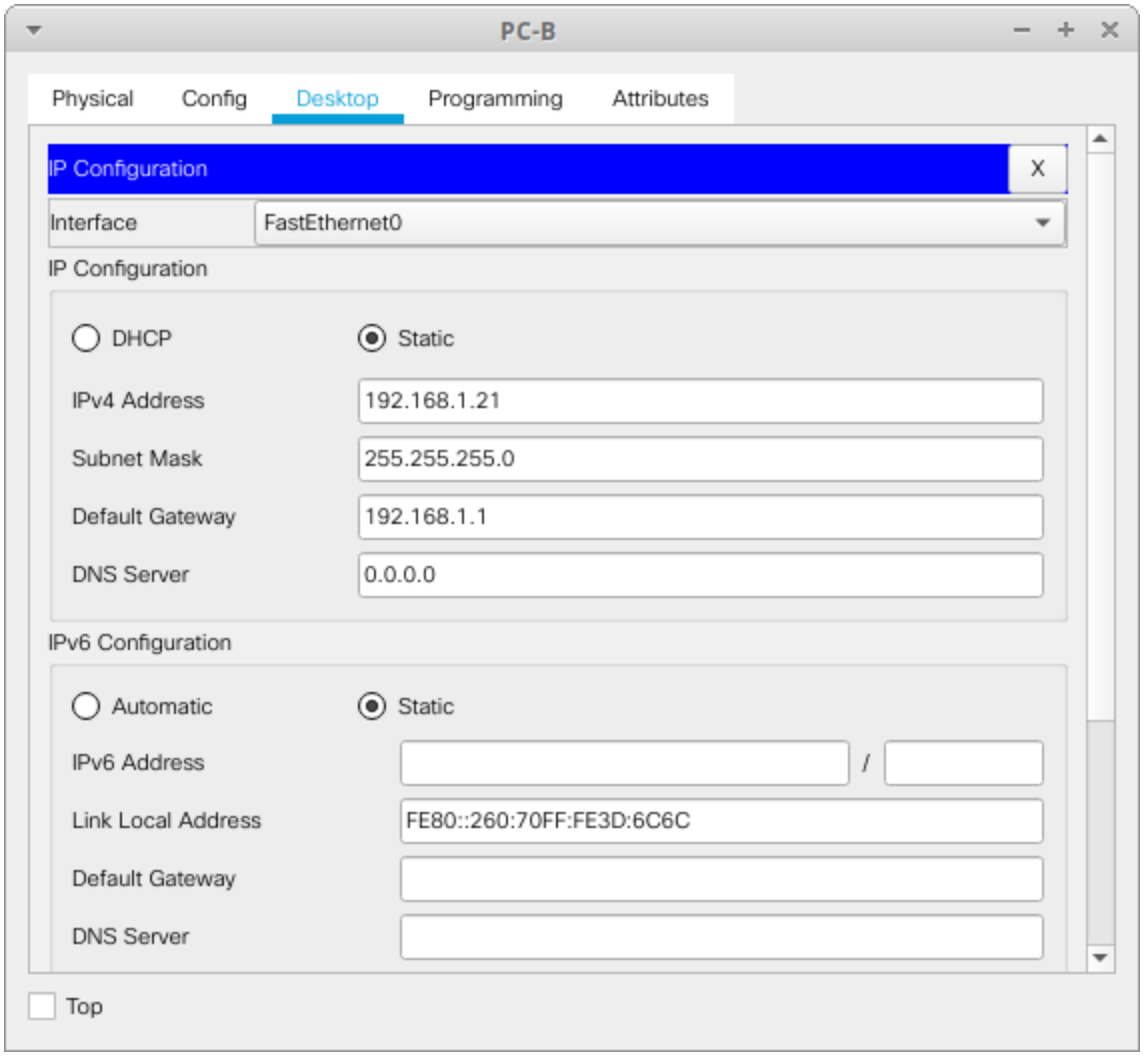
Connection : 2PCs, 1Switch, 2 routers

Step 2 : Configure PC hosts

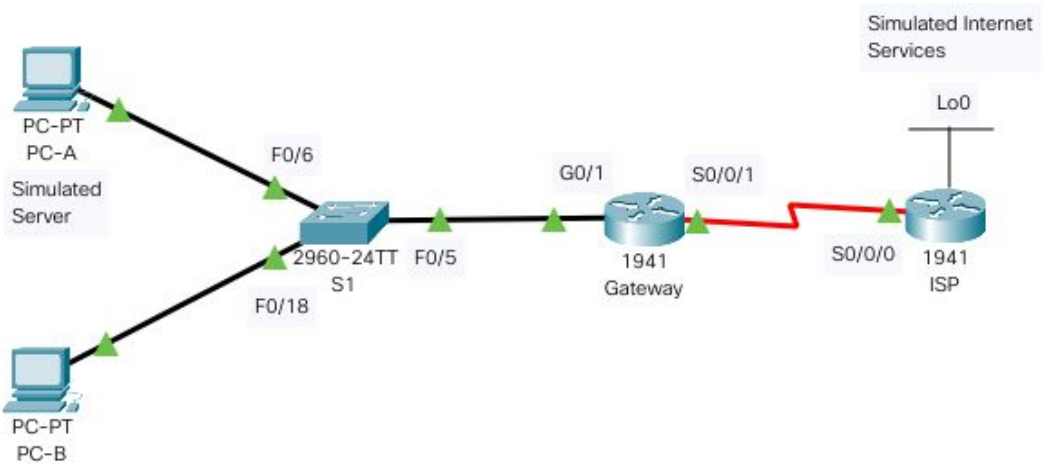
For PC - A :



For PC-B:

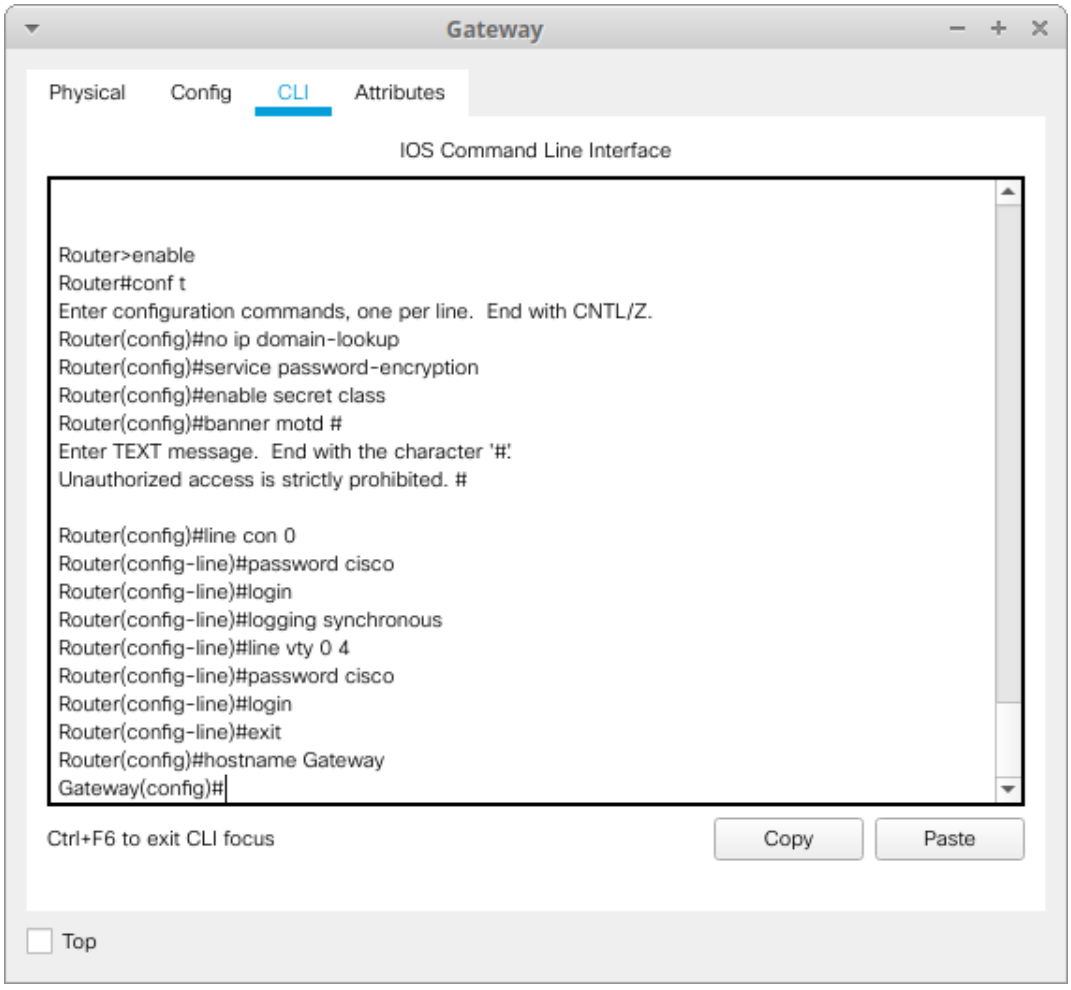

PC-B
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.21
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::260:70FF:FE3D:6C6C
Default Gateway
DNS Server
Top

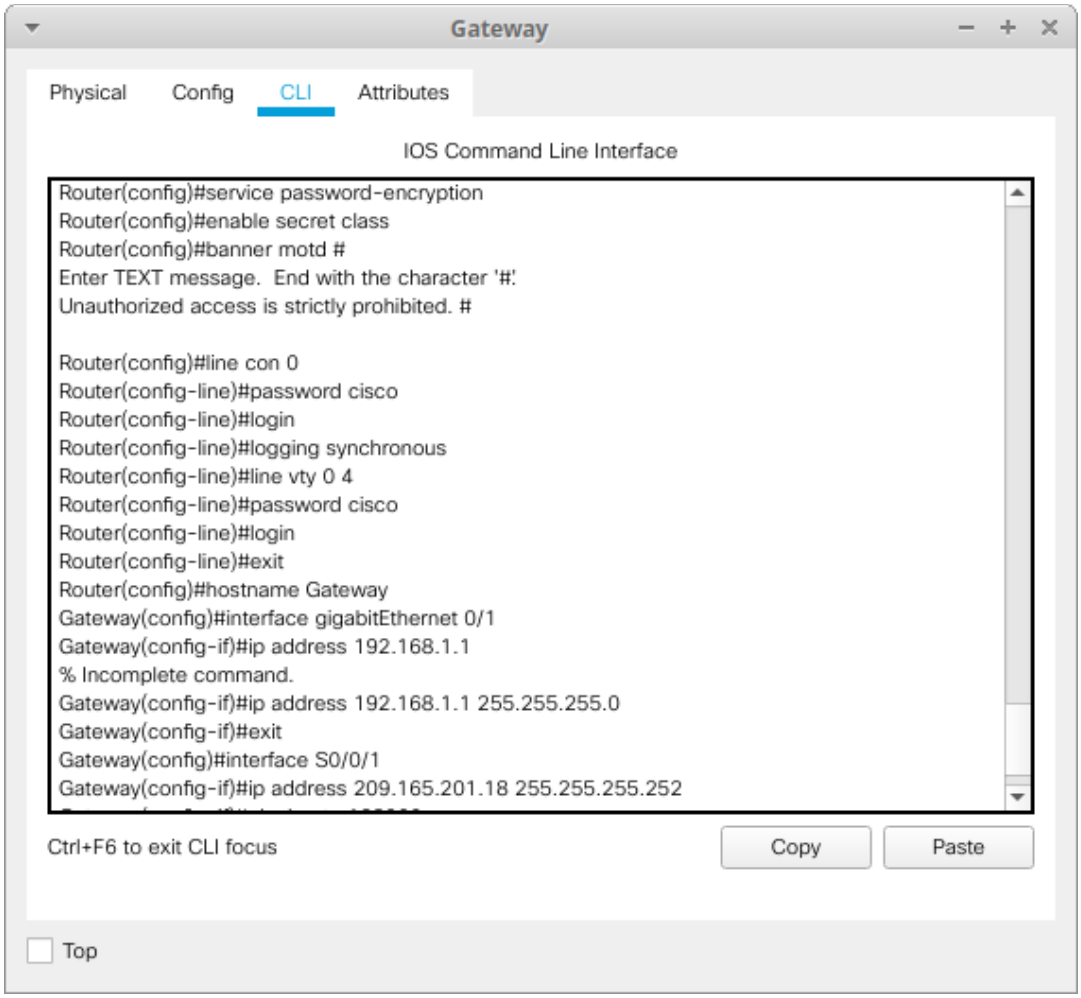
Step 3:Initialize and reload the routers and switches as necessary



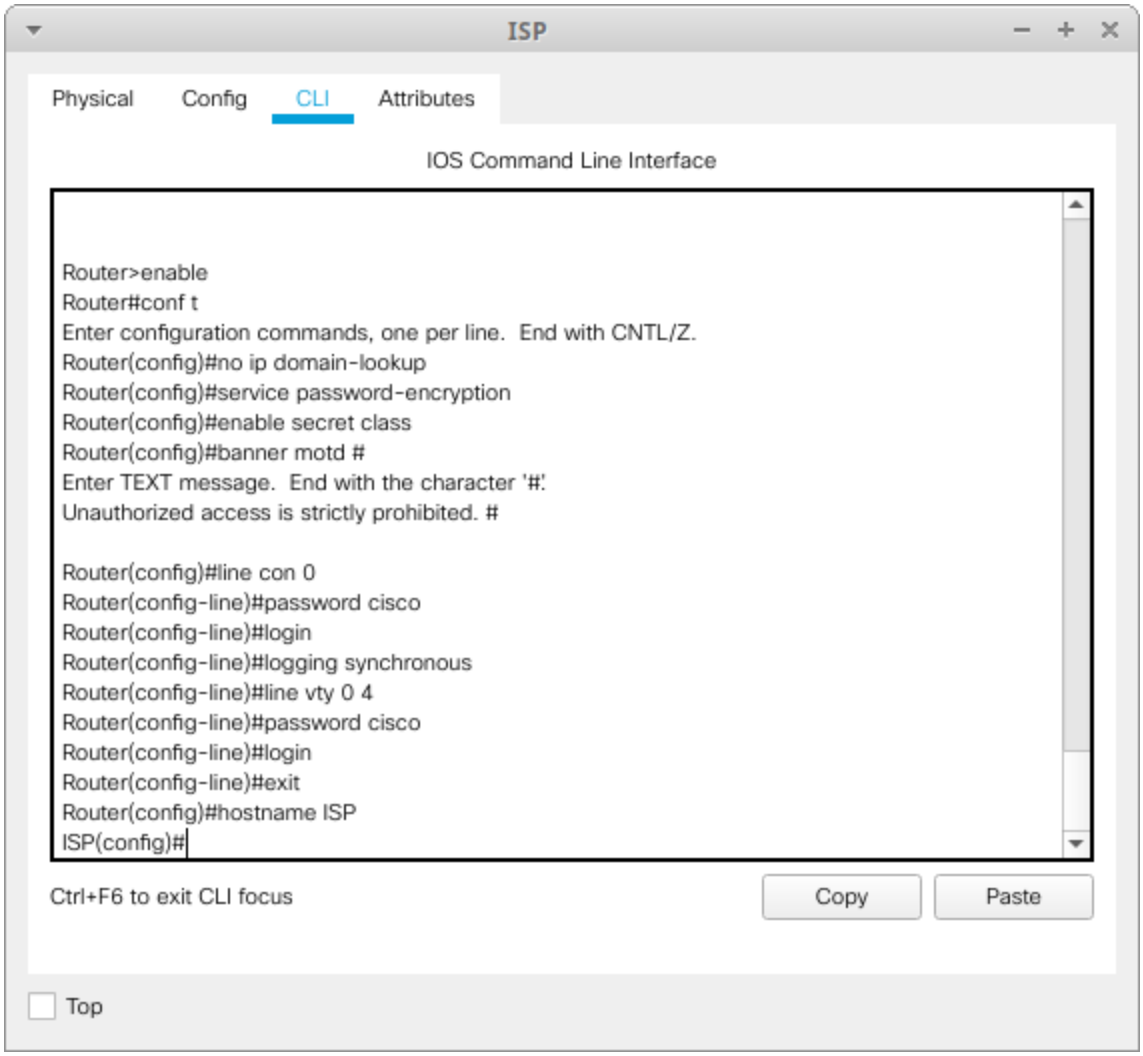
Step 4: Configure basic settings for each router.

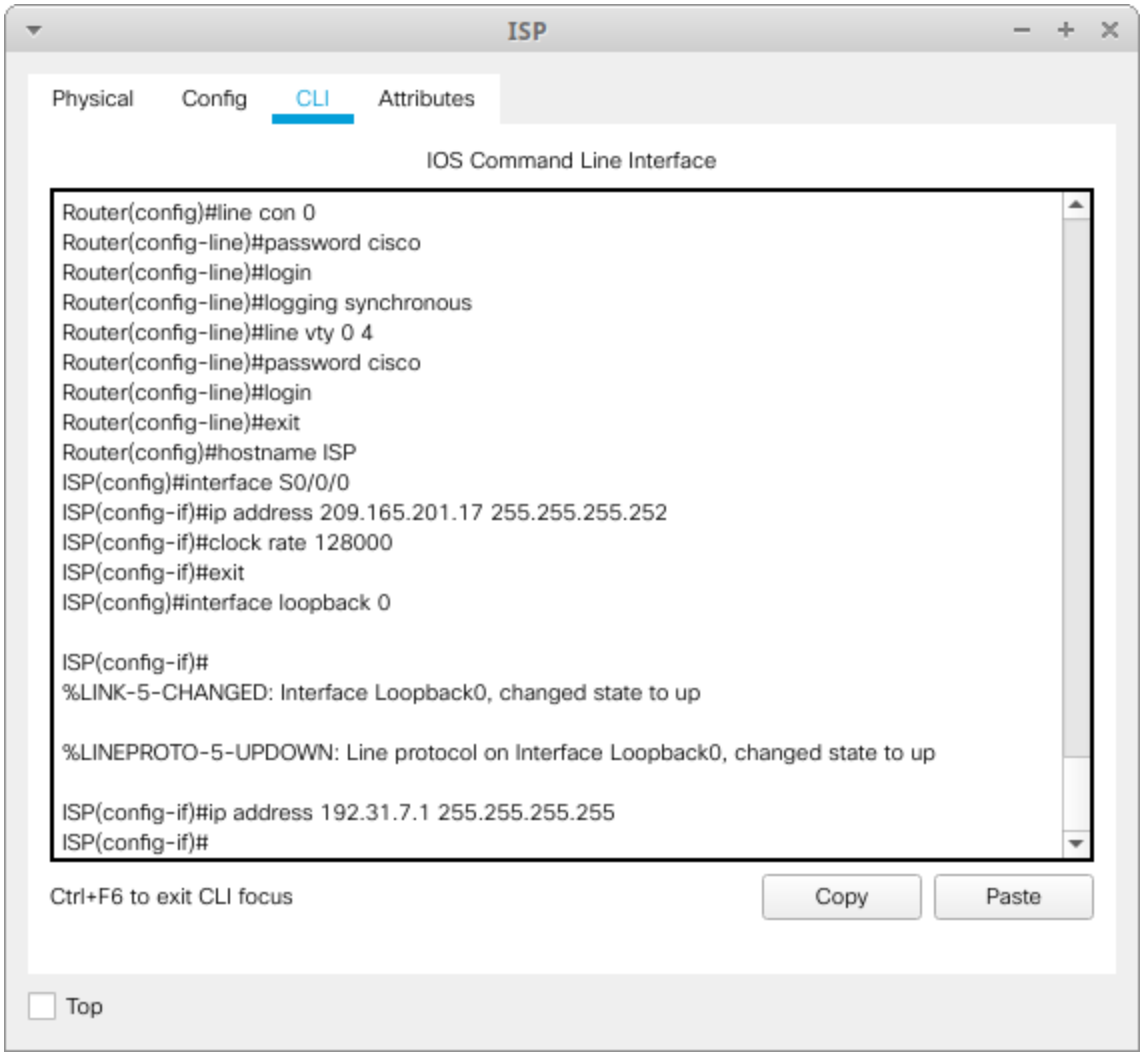
For Router- Gateway



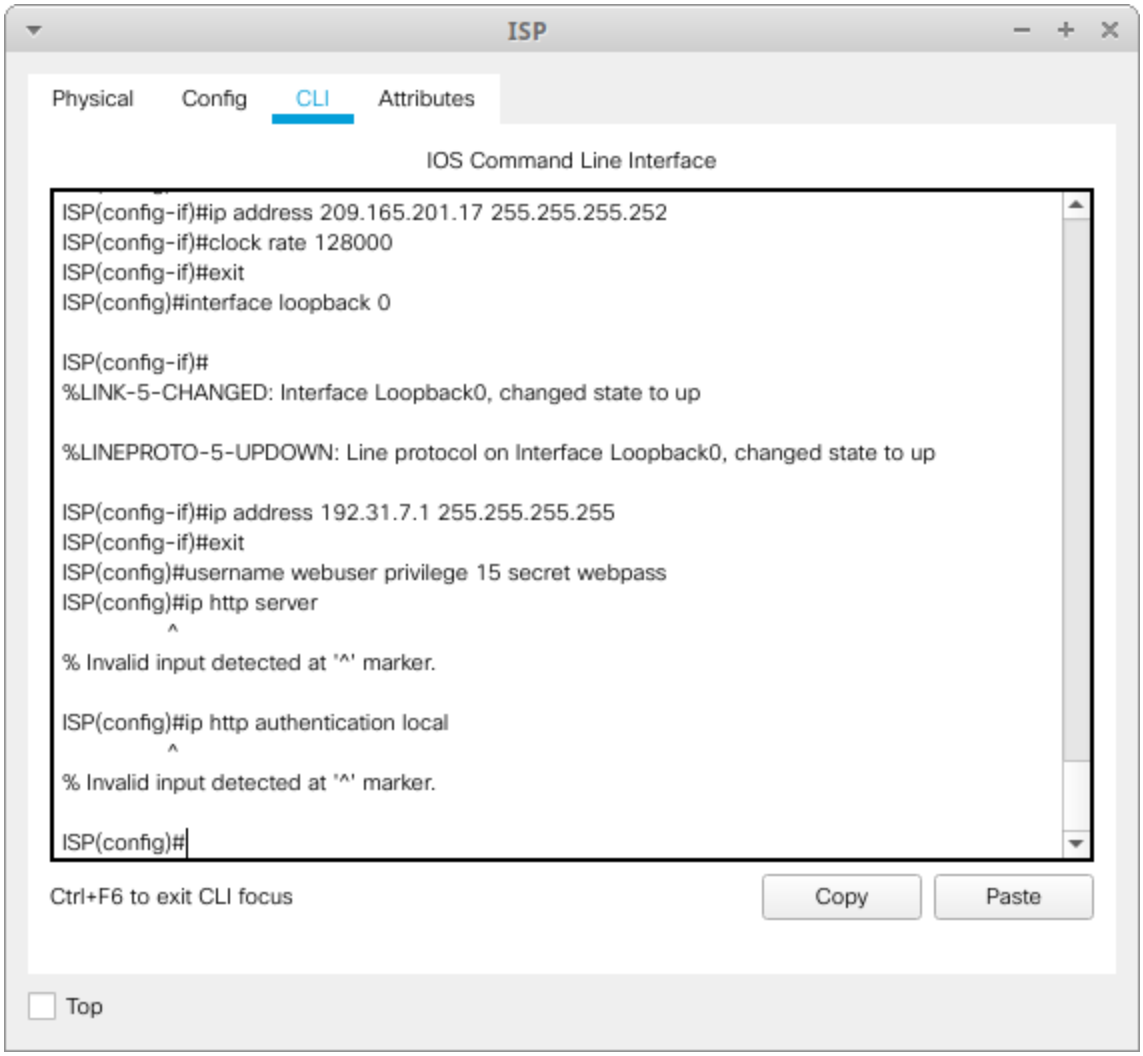

Gateway
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#service password-encryption
Router(config)#enable secret class
Router(config)#banner motd #
Enter TEXT message. End with the character '#'.
Unauthorized access is strictly prohibited. #
Router(config)#line con 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#logging synchronous
Router(config-line)#line vty 0 4
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#hostname Gateway
Gateway(config)#interface gigabitEthernet 0/1
Gateway(config-if)#ip address 192.168.1.1
% Incomplete command.
Gateway(config-if)#ip address 192.168.1.1 255.255.255.0
Gateway(config-if)#exit
Gateway(config)#interface S0/0/1
Gateway(config-if)#ip address 209.165.201.18 255.255.255.252
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

For router- ISP



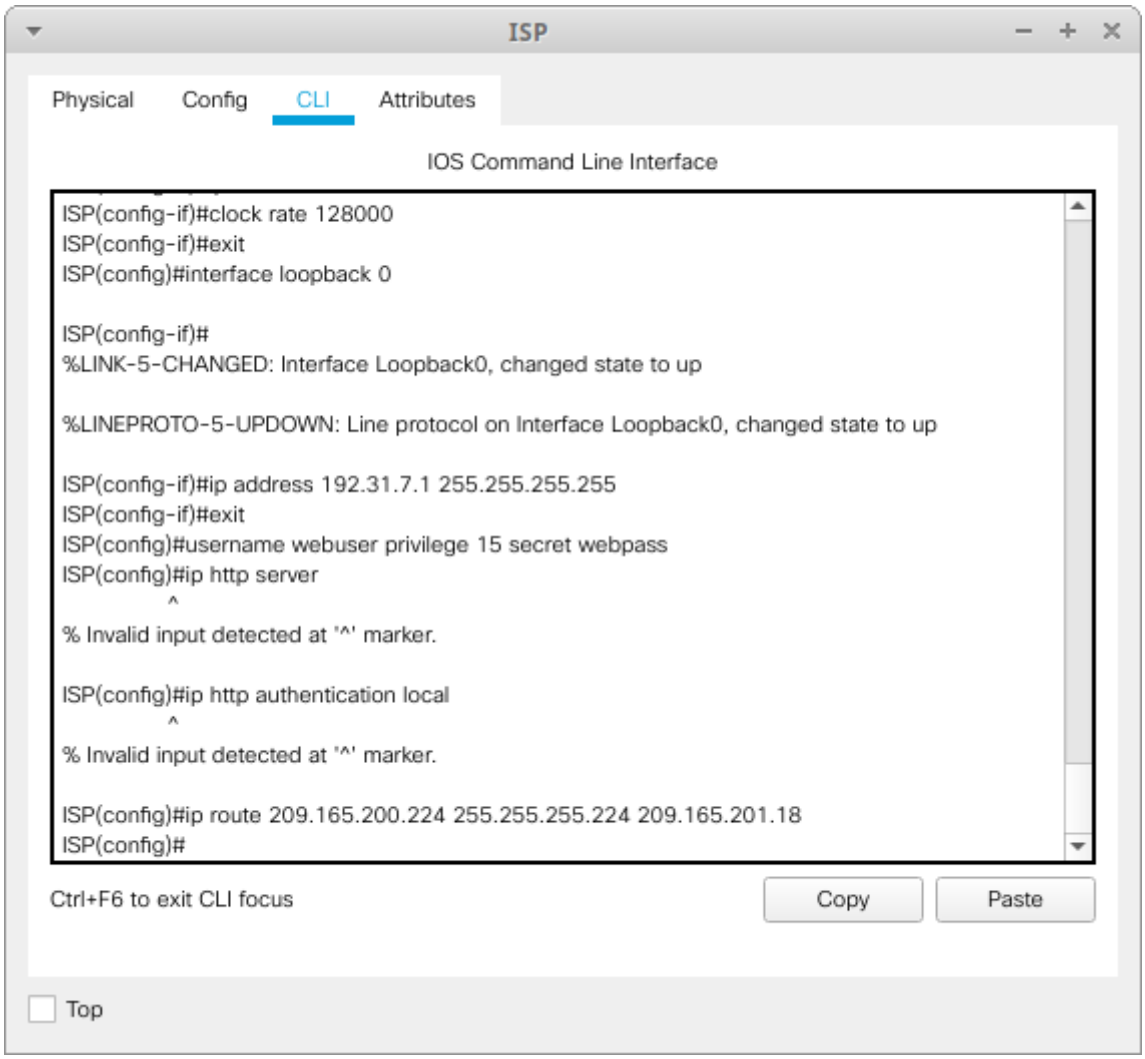

ISP
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#line con 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#logging synchronous
Router(config-line)#line vty 0 4
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#hostname ISP
ISP(config)#interface S0/0/0
ISP(config-if)#ip address 209.165.201.17 255.255.255.252
ISP(config-if)#clock rate 128000
ISP(config-if)#exit
ISP(config)#interface loopback 0
ISP(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
ISP(config-if)#ip address 192.31.7.1 255.255.255.255
ISP(config-if)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

Step 5: Create a simulated web server on ISP.

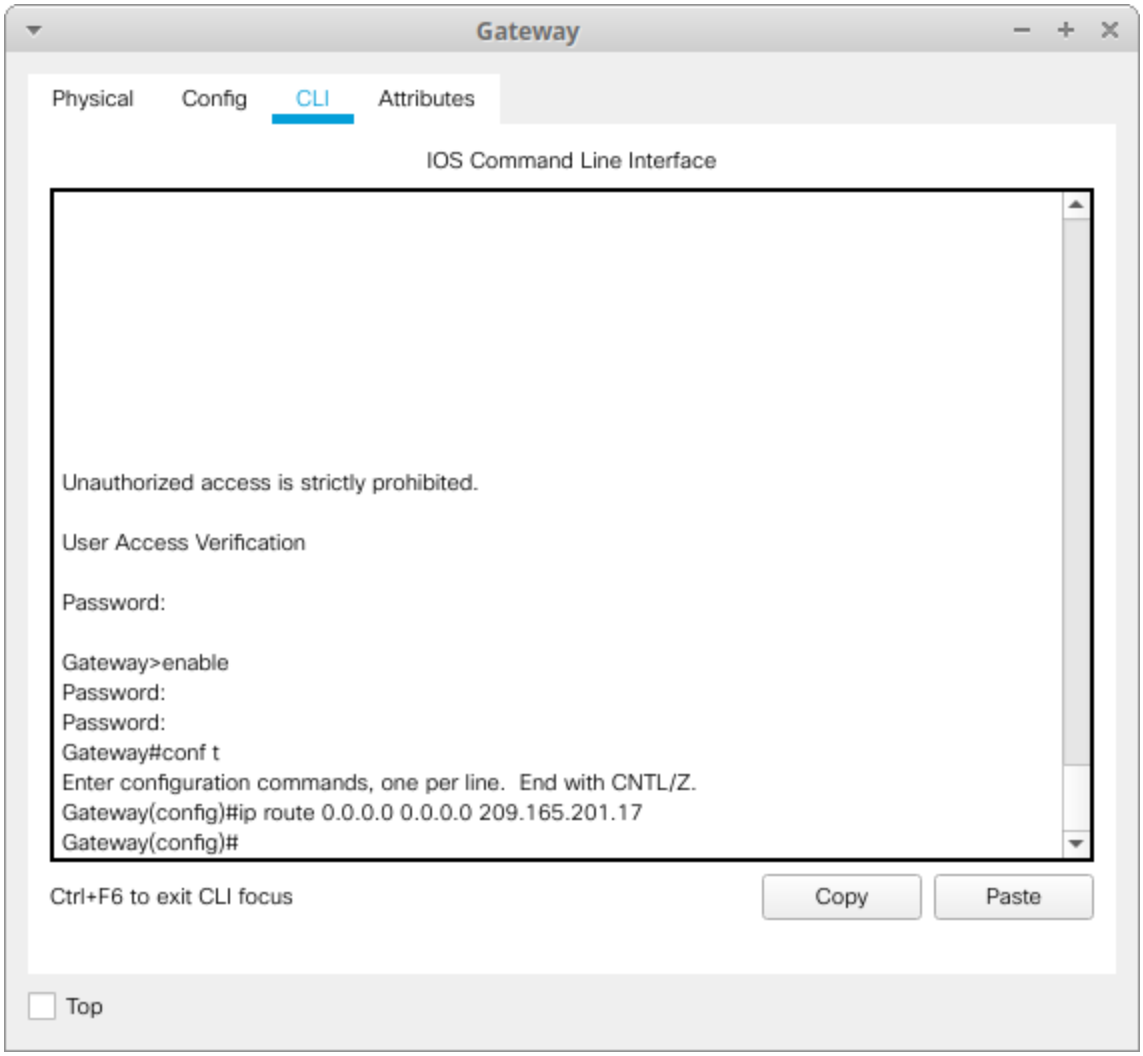


Step 6 : Configure static routing.

a. Create a static route from ISP router to the Gateway router using the assigned public network addressrange209.165.200.224/27.

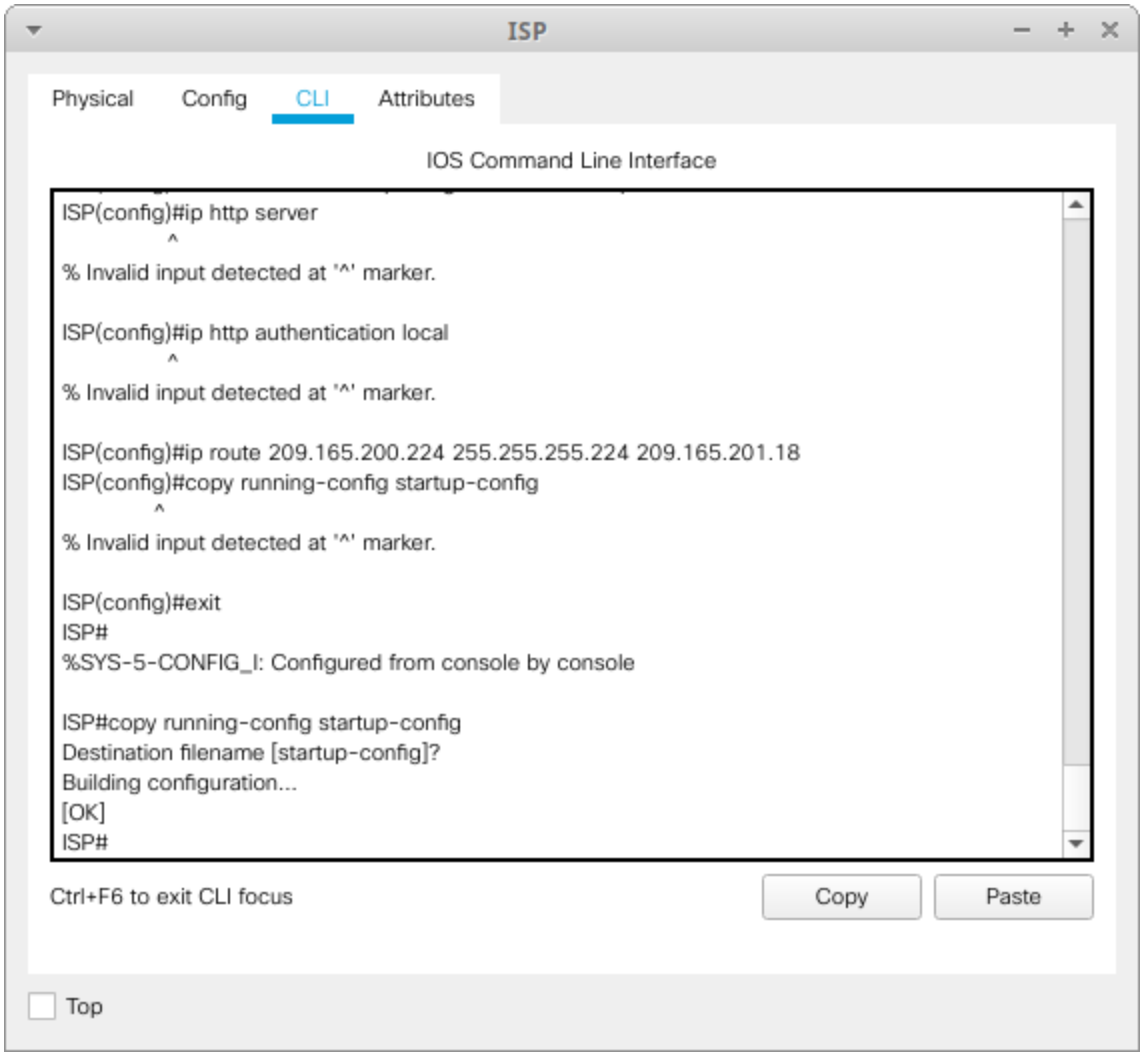


b. Create a default route from the Gateway router to the ISP router.

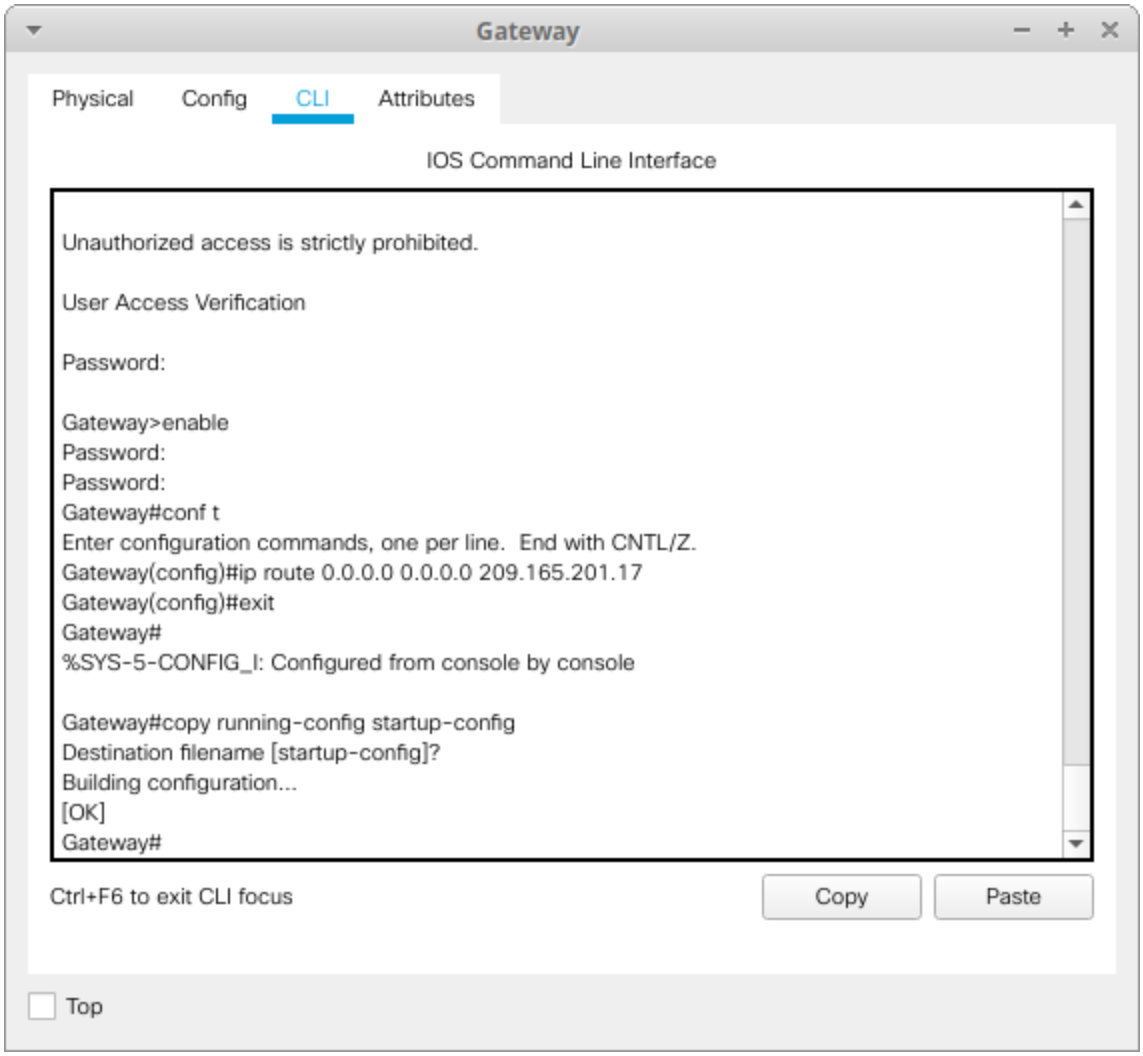


Step 7: Save the running configuration to the startup configuration

For the router- ISP

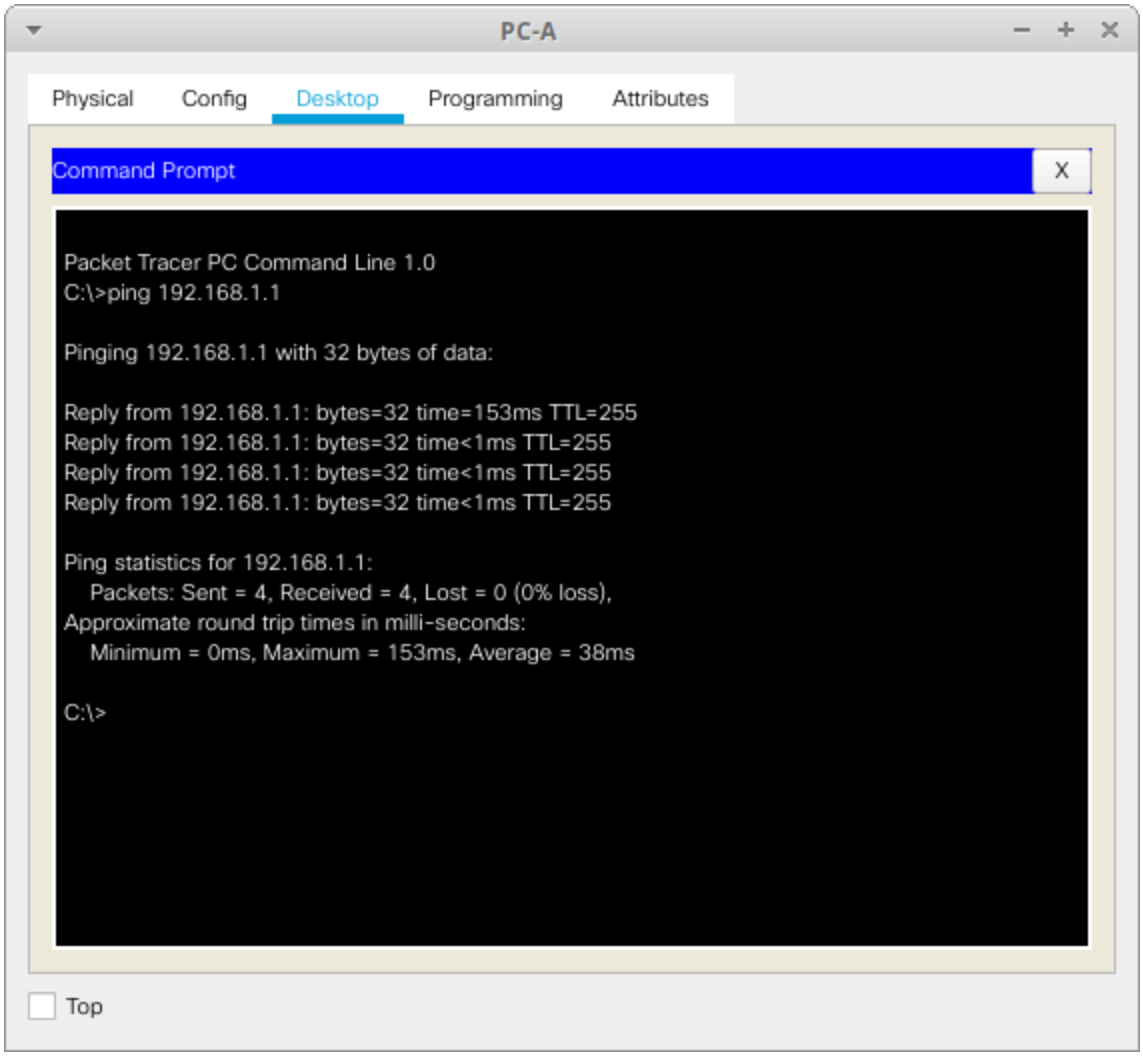


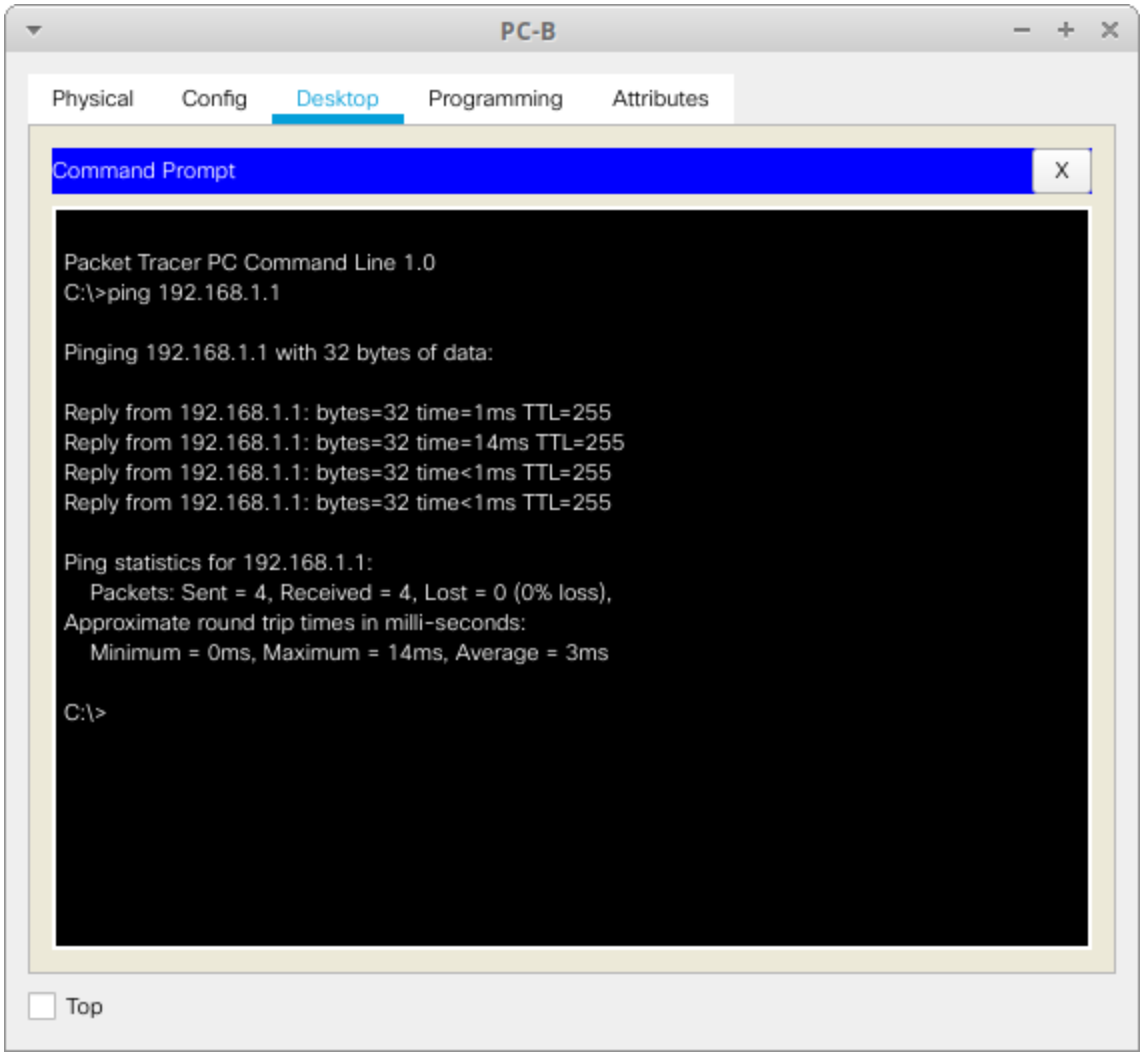
For the router- Gateway



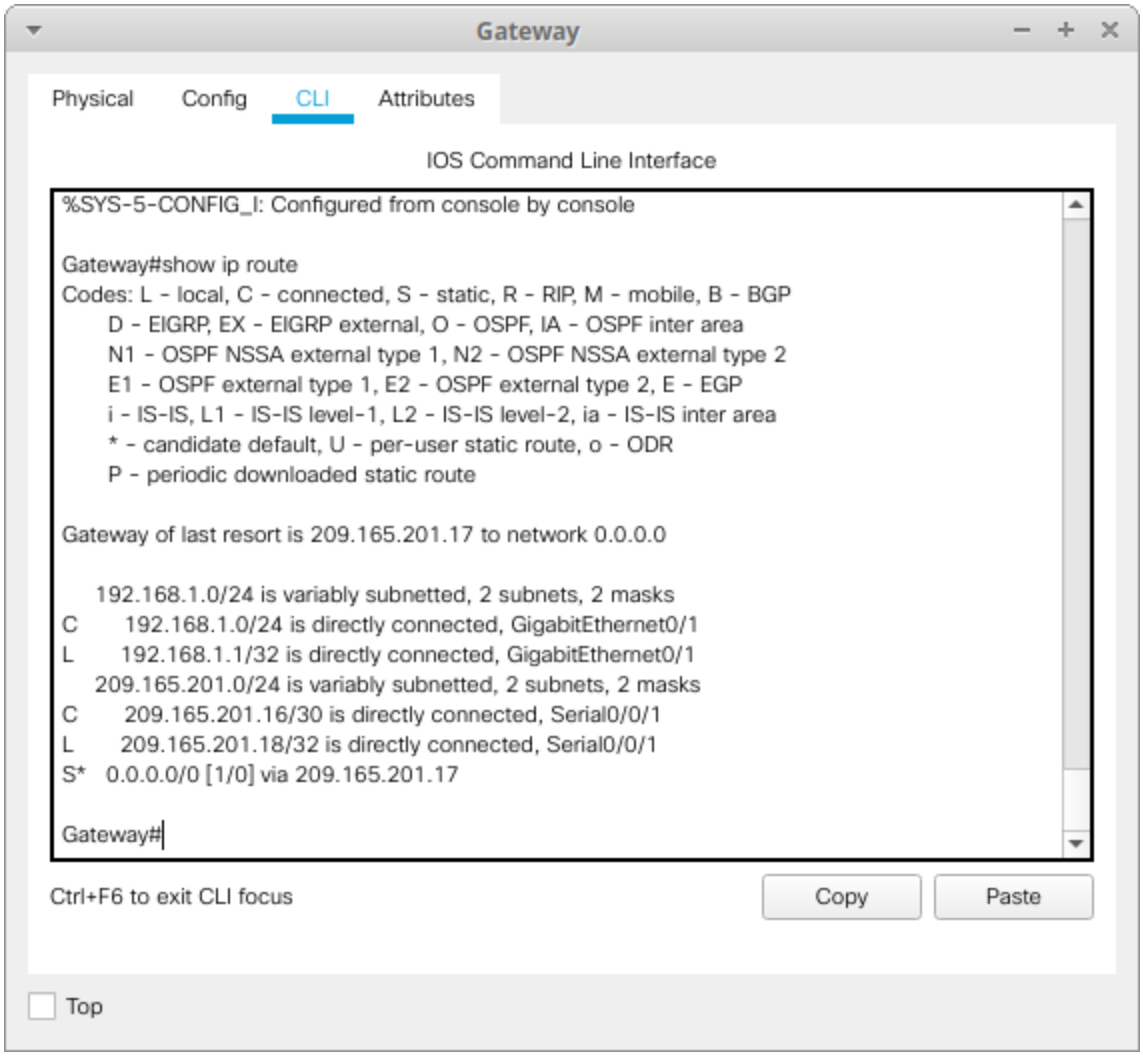
Step 8: Verify network connectivity

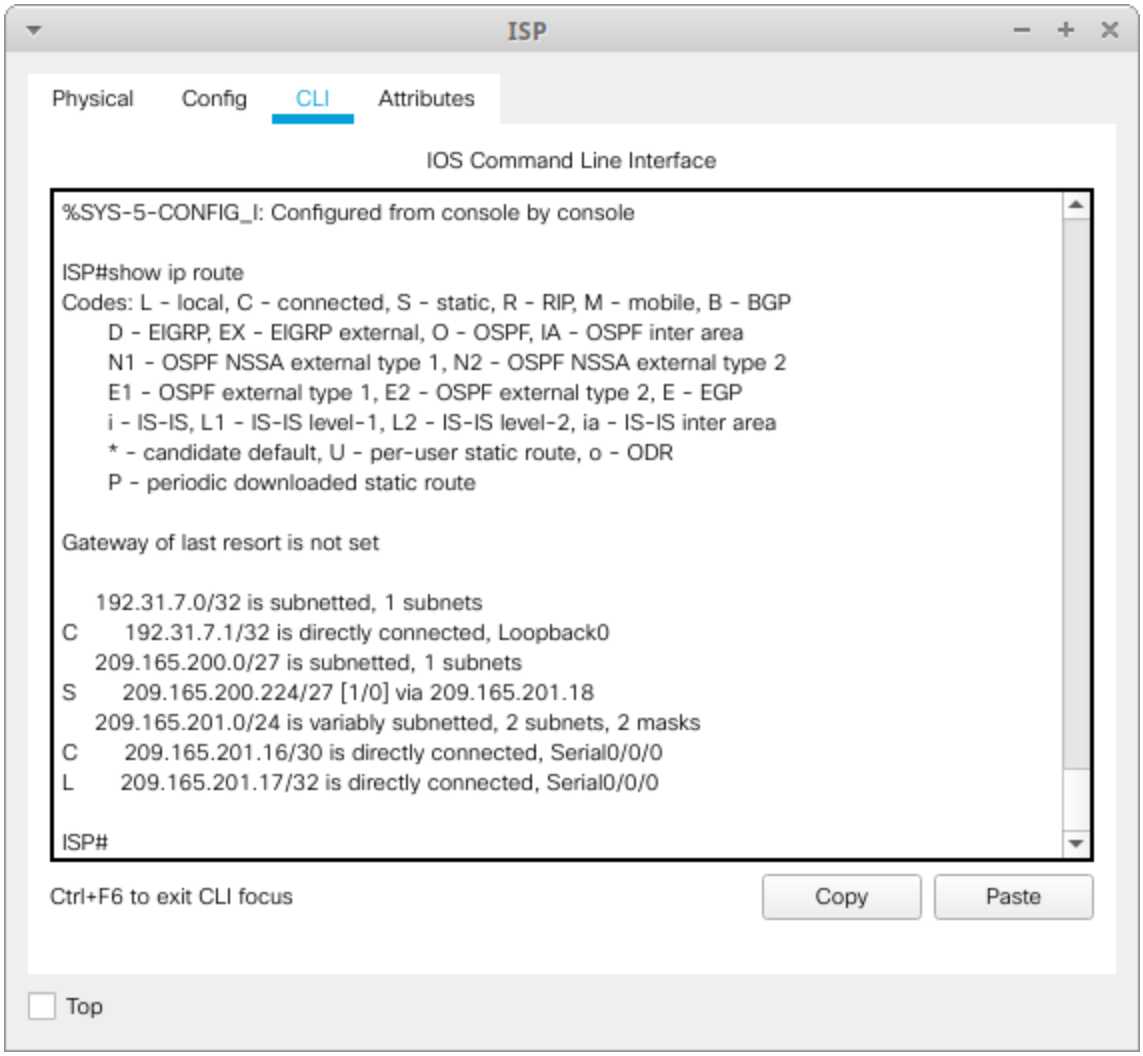
a.From the PC hosts, ping the G0/1 interface on the Gateway router. Troubleshoot if the pings are unsuccessful




PC-B
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.1
Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=1ms TTL=255
Reply from 192.168.1.1: bytes=32 time=14ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 14ms, Average = 3ms
C:\>
Top

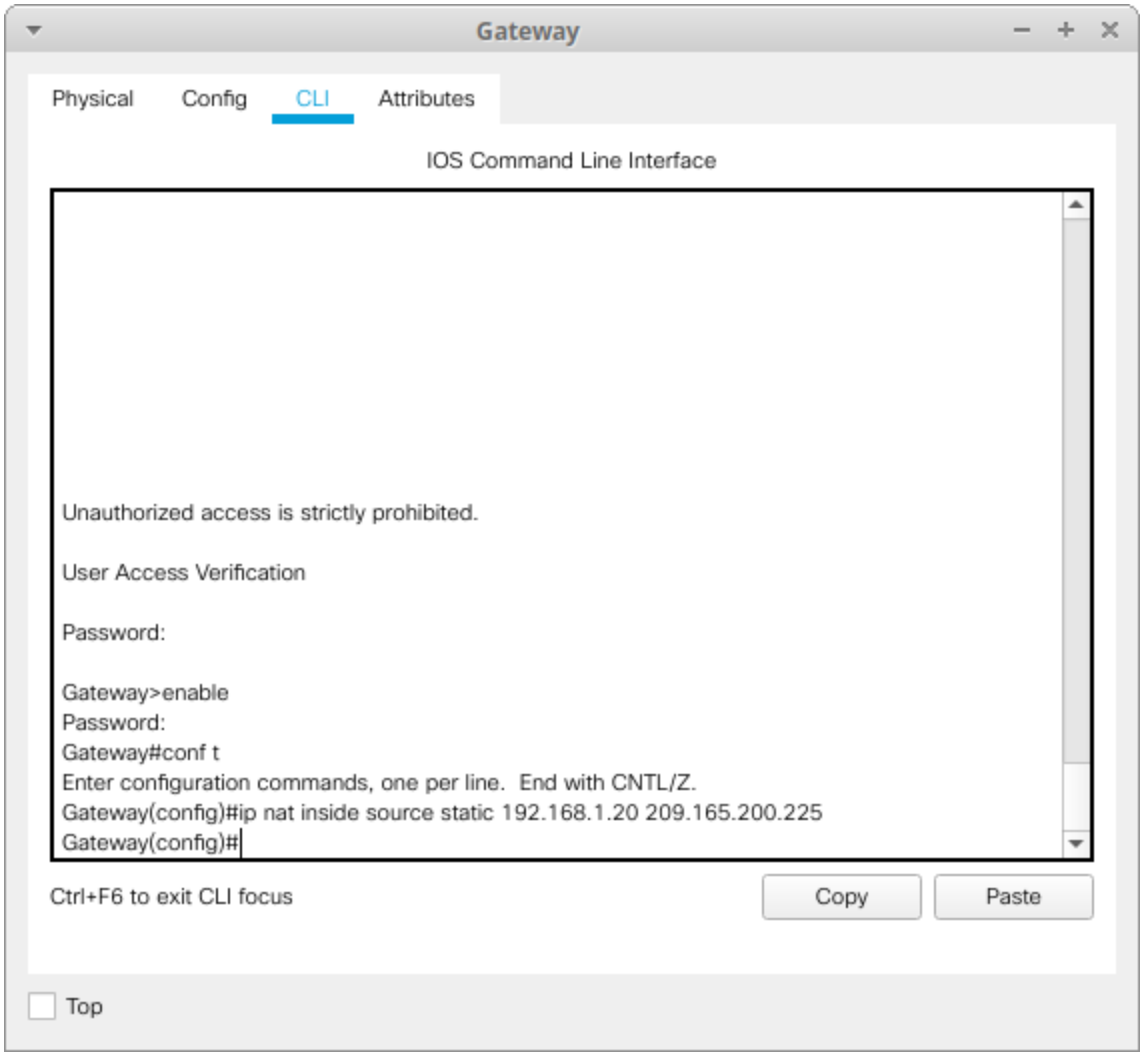
b. Display the routing tables on both routers to verify that the static routes are in the routing table and configured correctly on both routers.



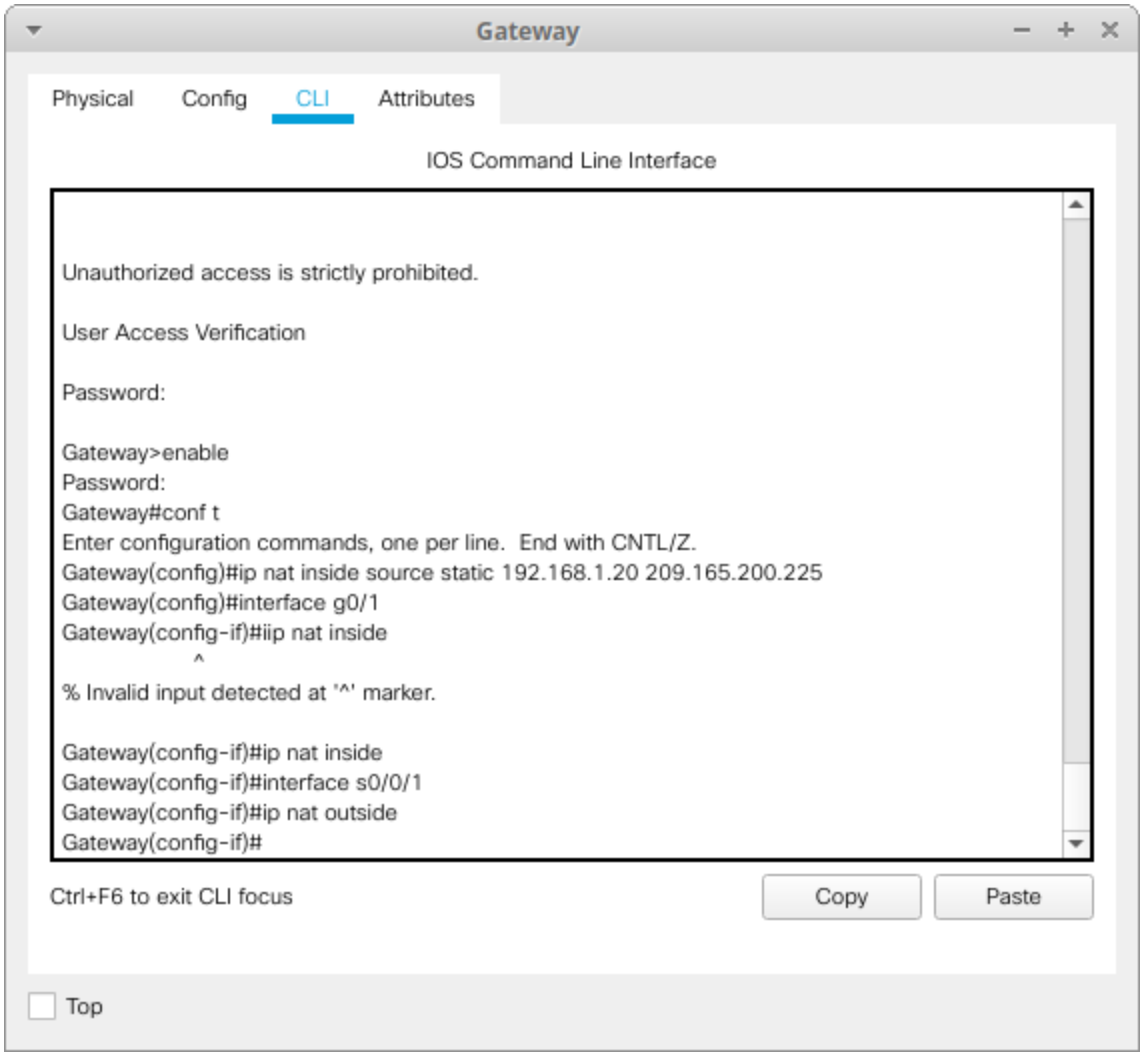

ISP
Physical
Config
CLI
Attributes
IOS Command Line Interface
%SYS-5-CONFIG_I: Configured from console by console
ISP#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
192.31.7.0/32 is subnetted, 1 subnets
C 192.31.7.1/32 is directly connected, Loopback0
209.165.200.0/27 is subnetted, 1 subnets
S 209.165.200.224/27 [1/0] via 209.165.201.18
209.165.201.0/24 is variably subnetted, 2 subnets, 2 masks
C 209.165.201.16/30 is directly connected, Serial0/0/0
L 209.165.201.17/32 is directly connected, Serial0/0/0
ISP#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

Part 2:Configure and Verify Static NAT

Step 1:Configure a static mapping

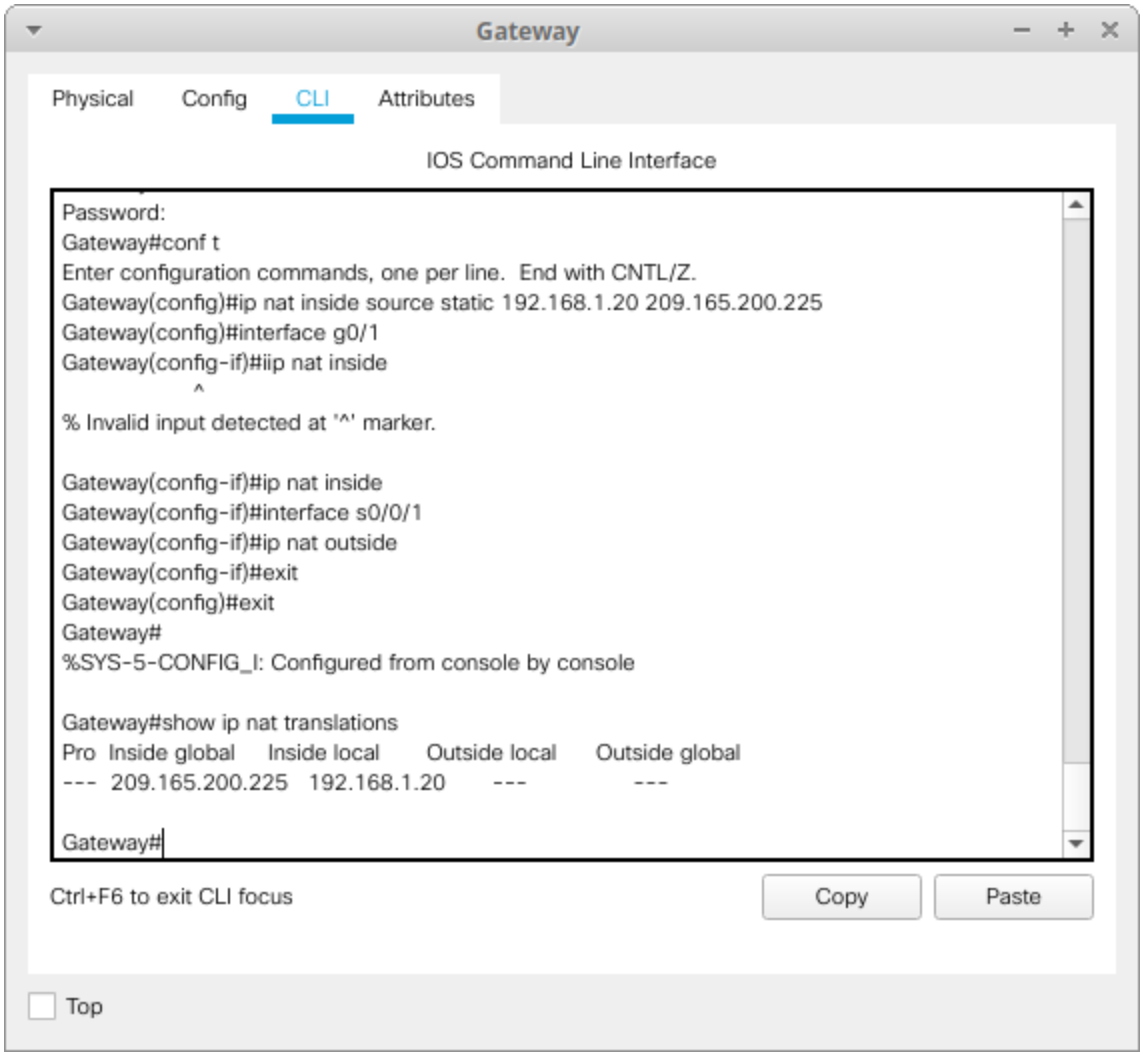


Step 2: Specify the interfaces.



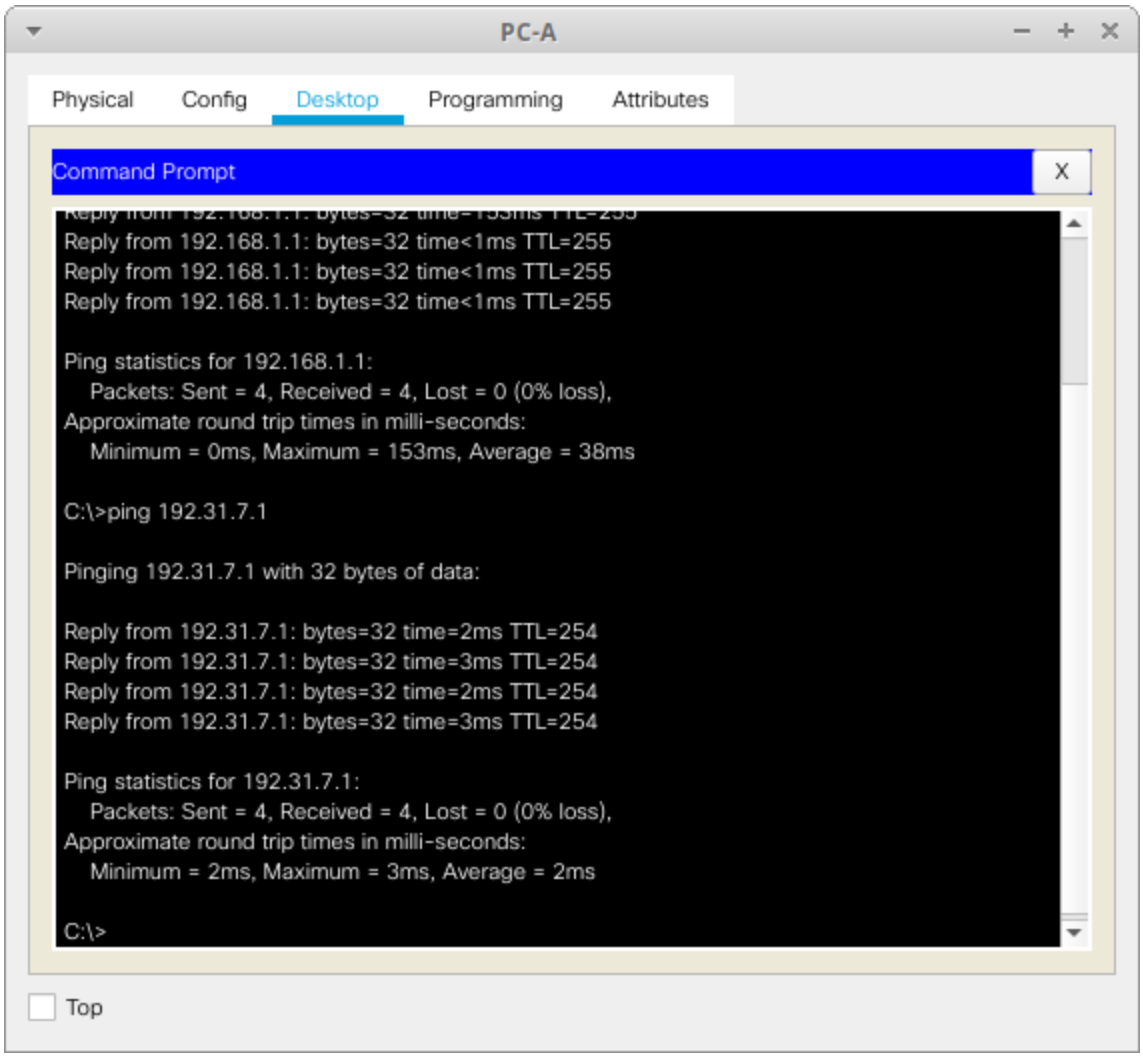
Step 3: Test the configuration.

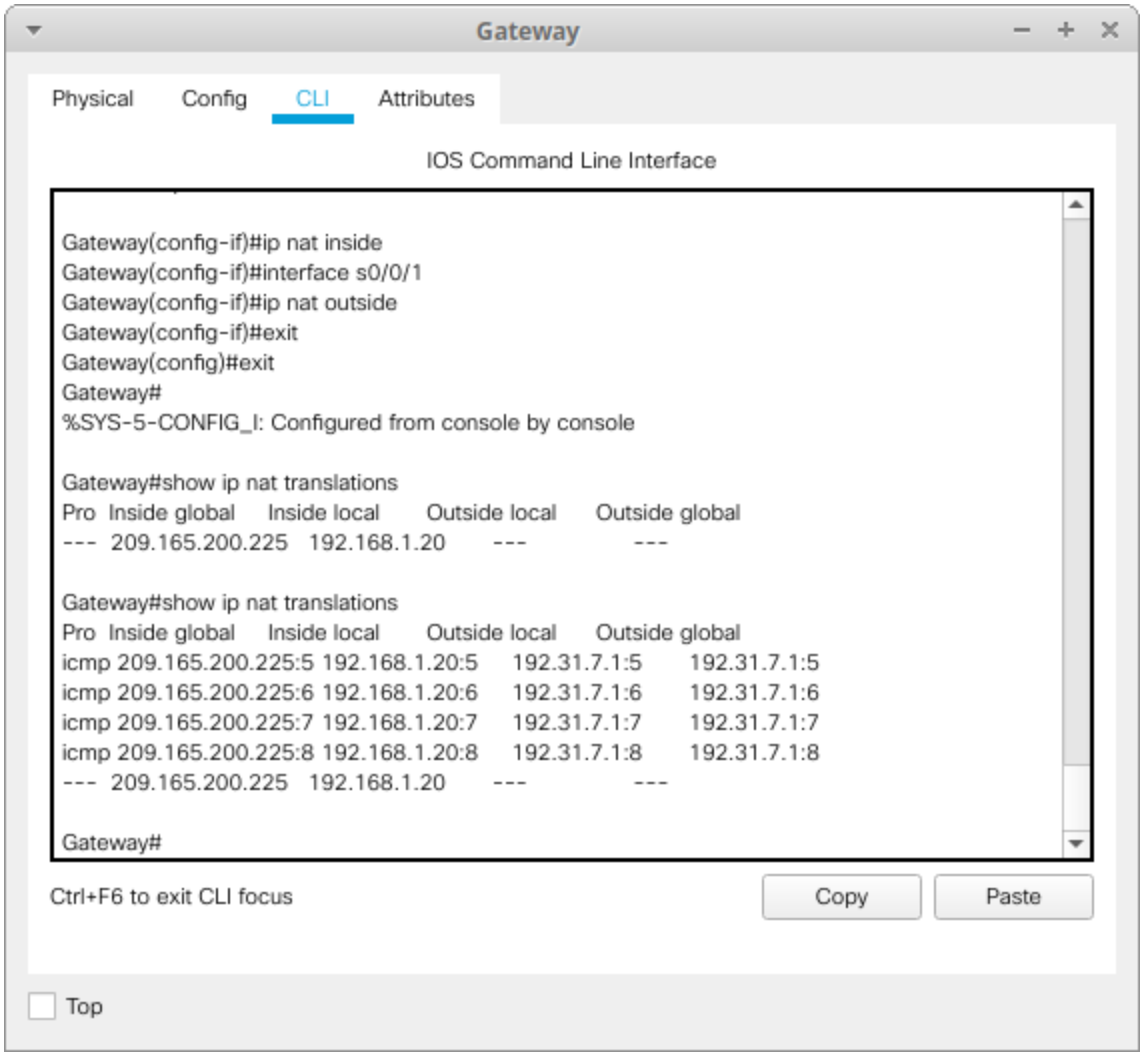
a.Display the static NAT table by issuing the show ip nat translations command.



What is the translation of the Inside local host address?
192.168.1.20= **209.165.200.225**
The Inside global address is assigned by?
Static: ISP
Dynamic: NAT pool
The Inside local address is assigned by? **Administrator**

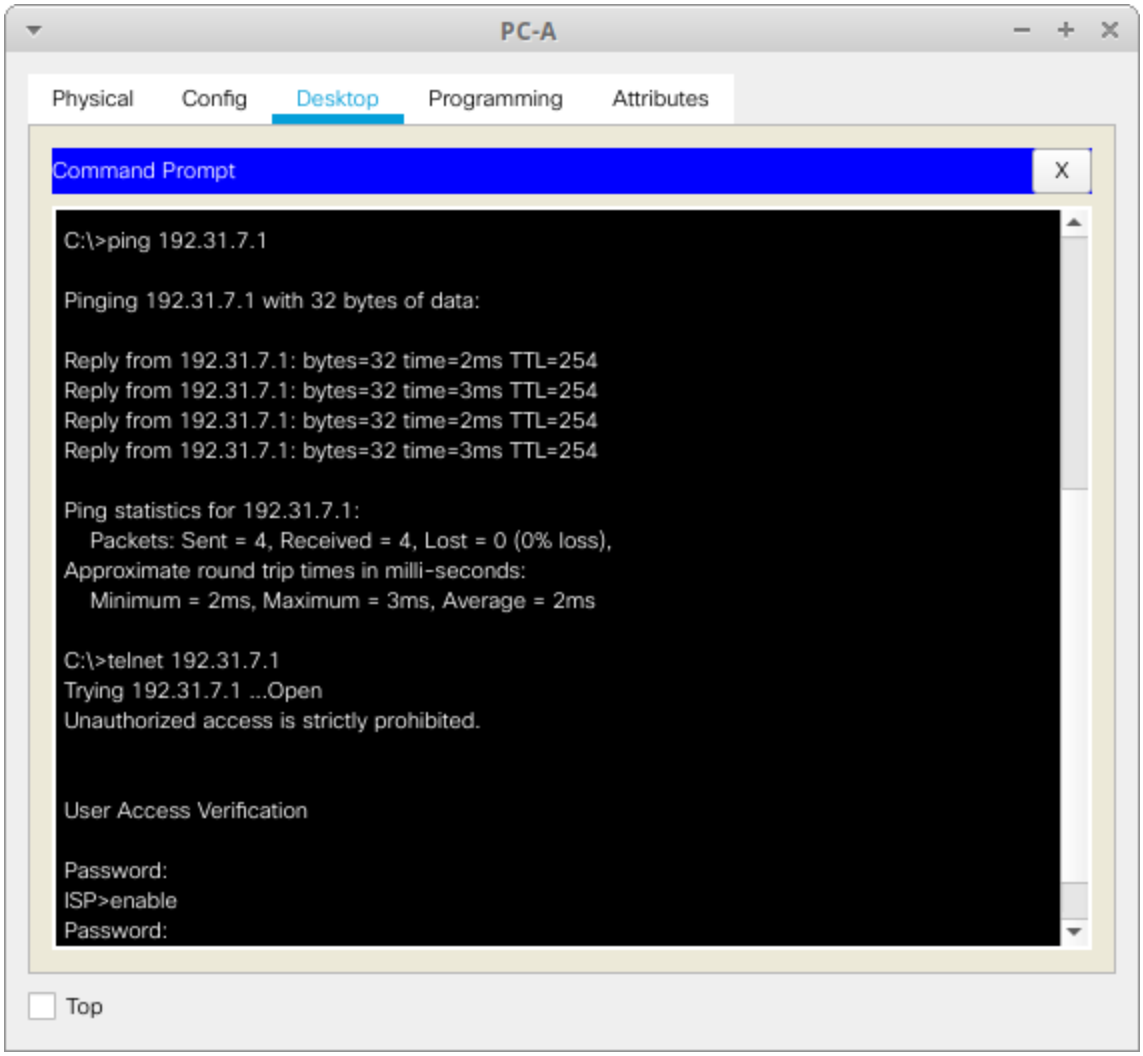
b.From PC-A, ping the Lo0 interface (192.31.7.1) on ISP. If The ping is unsuccessful,troubleshoot and correct the issues. On the Gateway router, display the NAT table

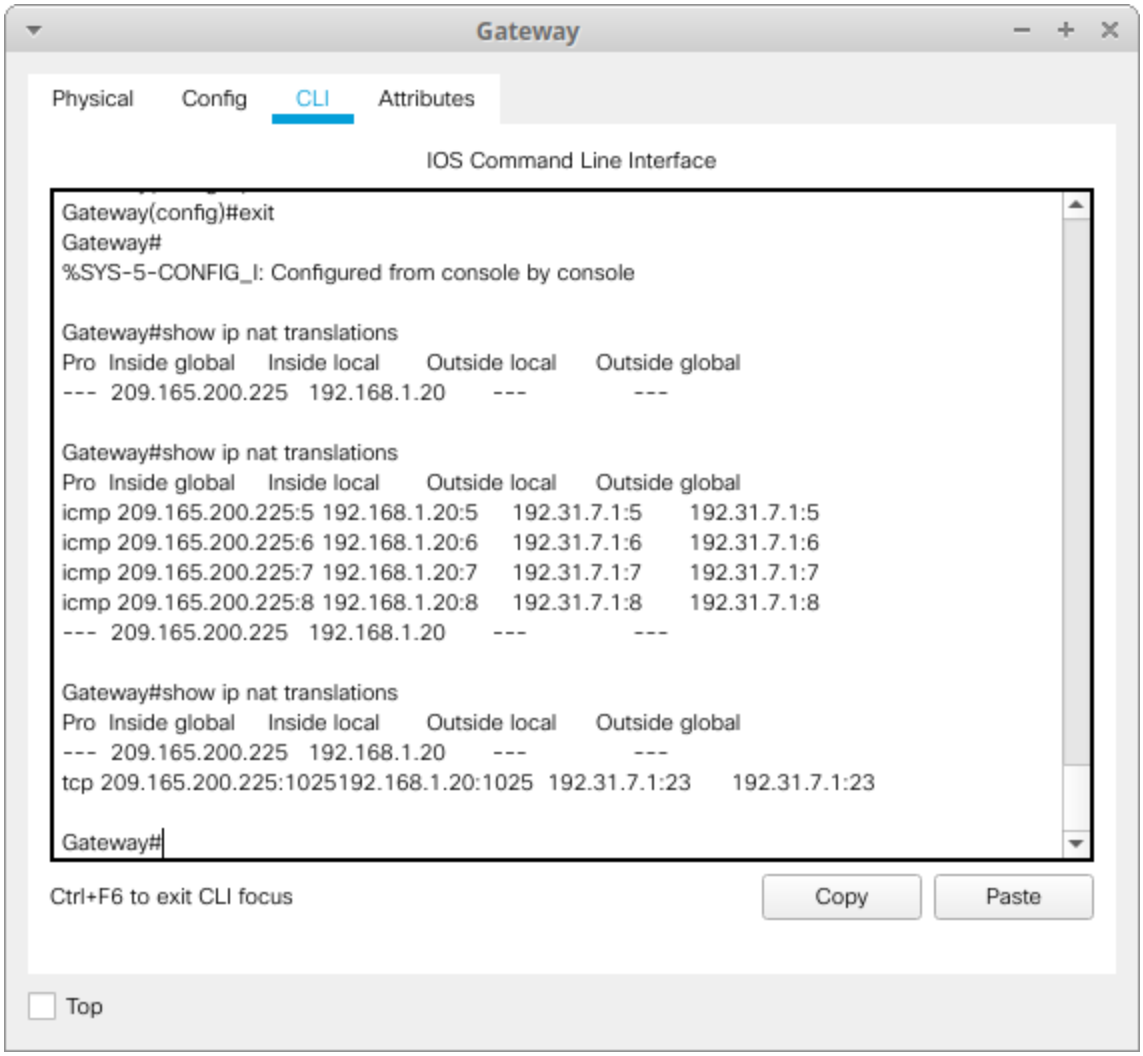




What port number was used in this ICMP exchange? **5,6,7,8**

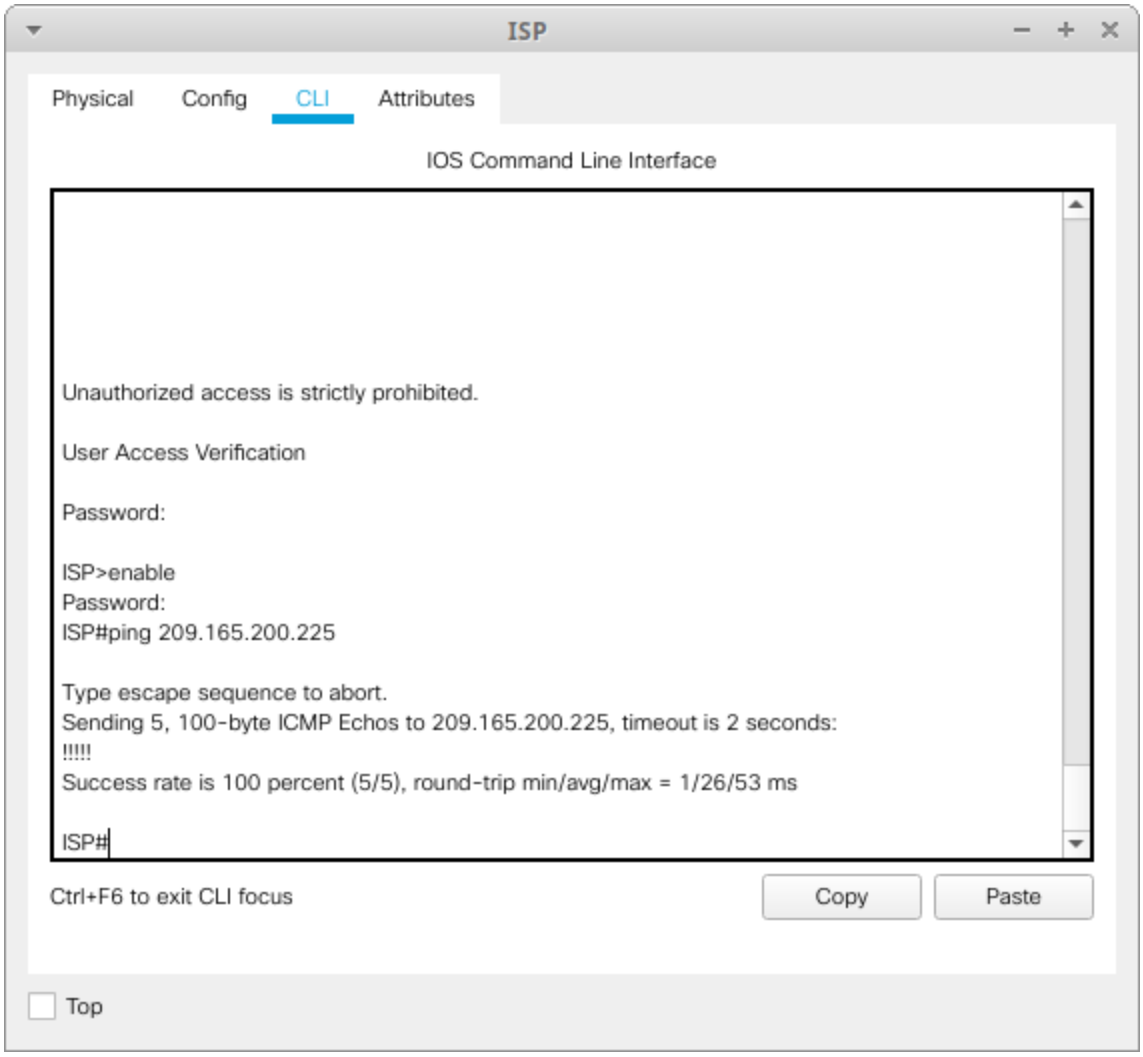
c. From PC-A, telnet to the ISP Lo0 interface and display the NAT table



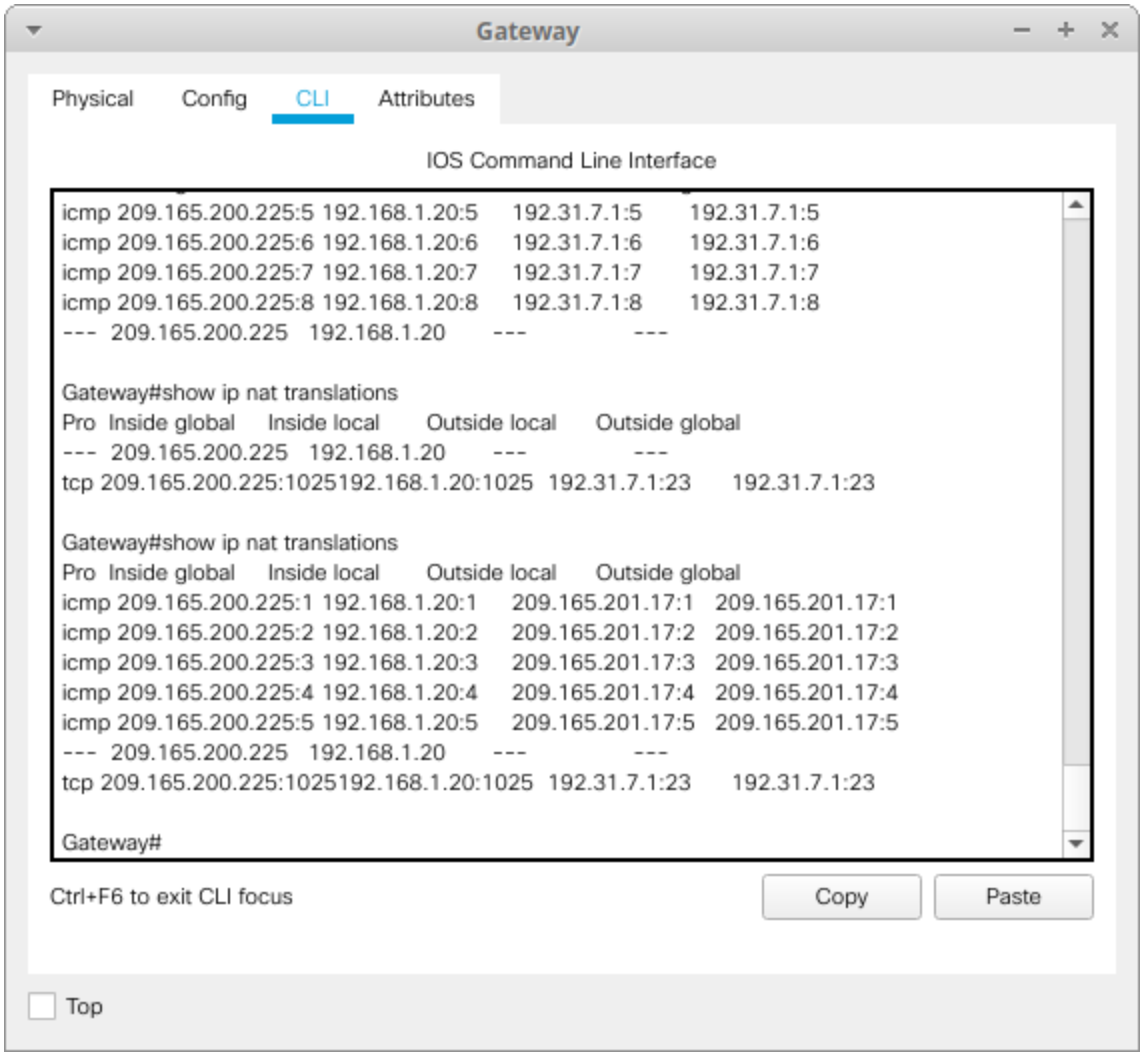


What was the protocol used in this translation? **TCP**
What are the port numbers used?
Inside global / local: **1025**
Outside global / local: **23**

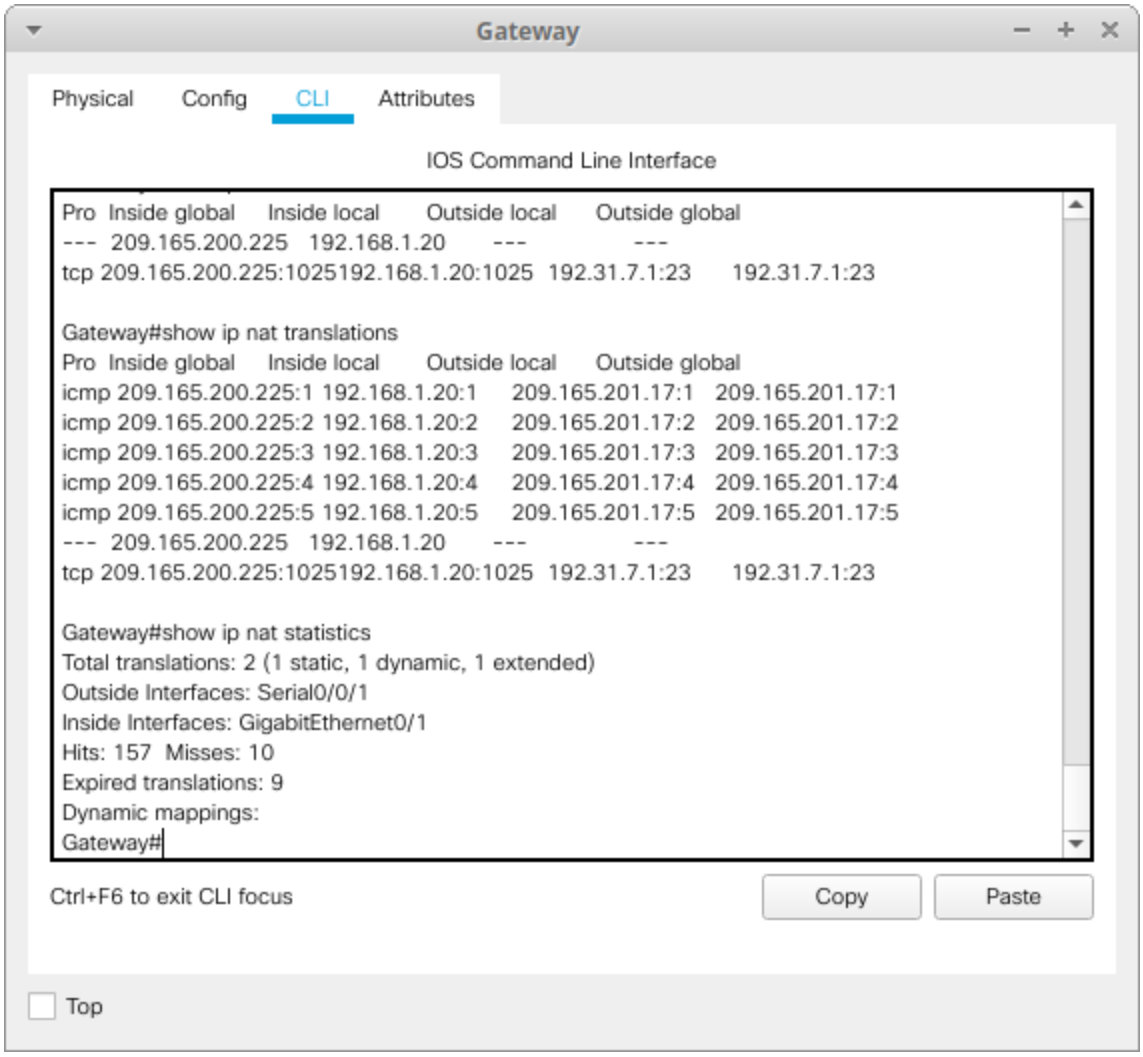
d. Because static NAT was configured for PC-A, verify that pinging from ISP to PC-A at the static NAT public address (209.165.200.225) is successful



e. On the Gateway router, display the NAT table to verify the translation

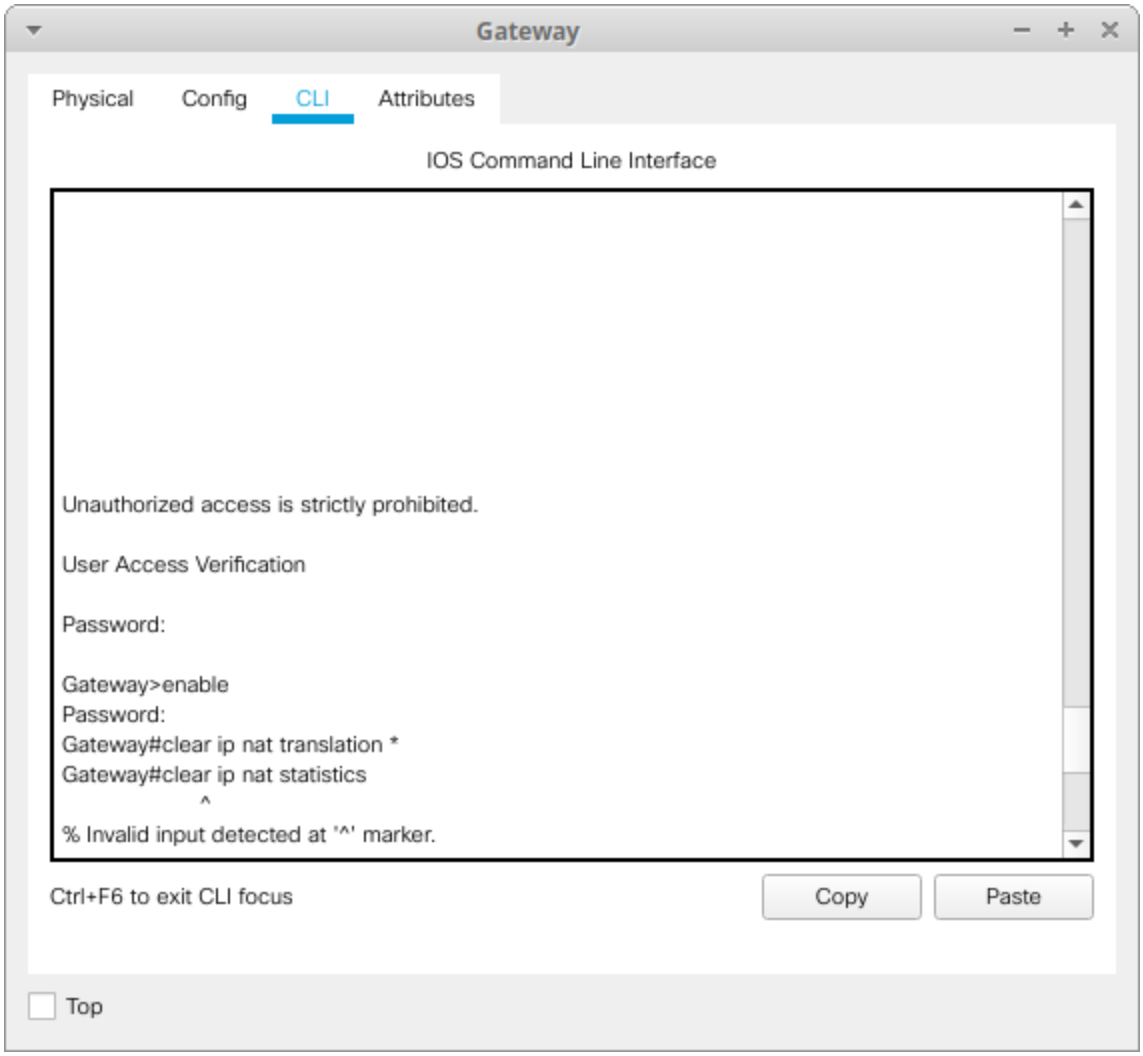


f. Verify NAT statistics by using the show ip nat statistics command on the Gateway Router.



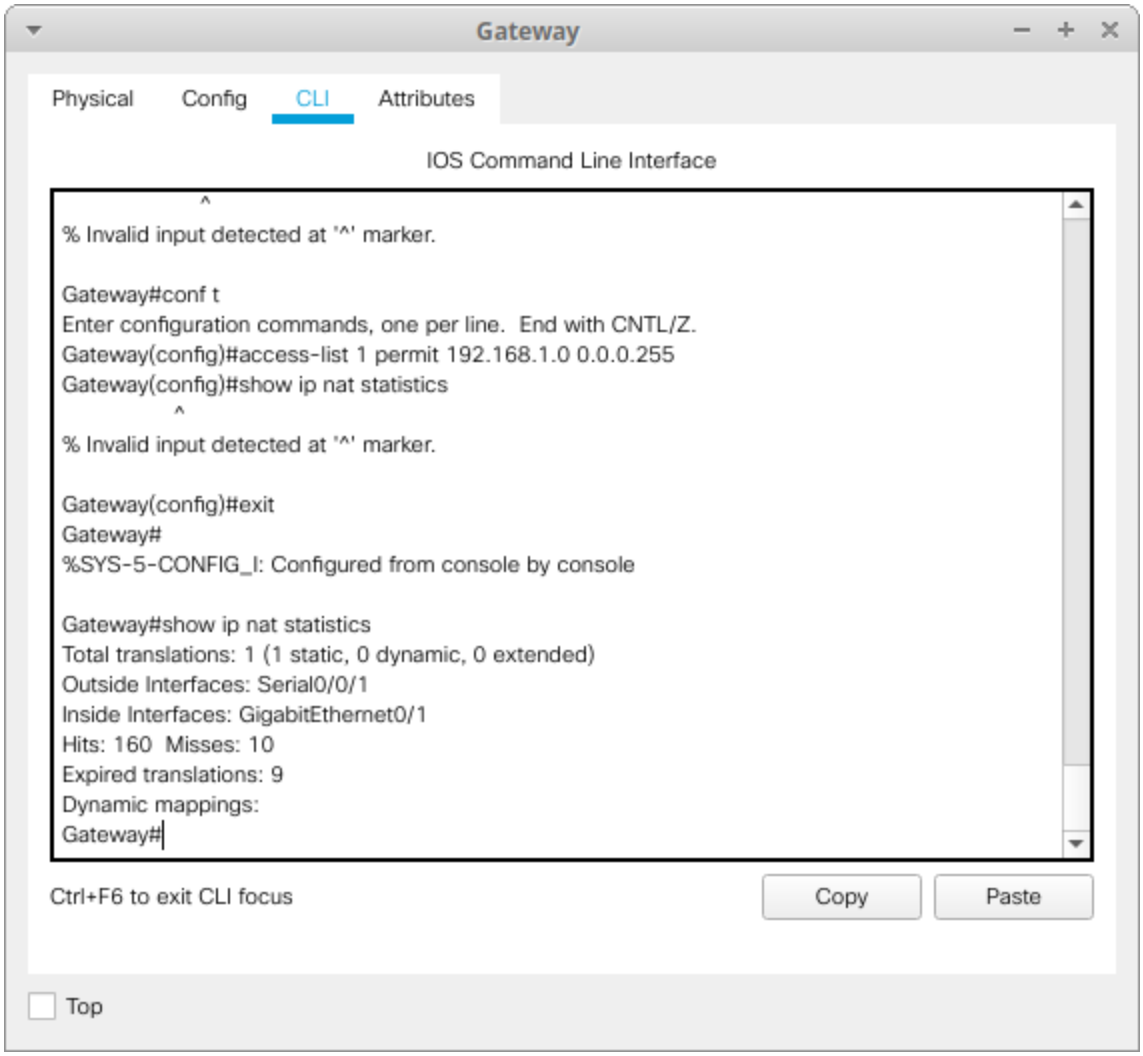
Part 3: Configure and Verify Dynamic NAT

Step 1: Clear NATs.

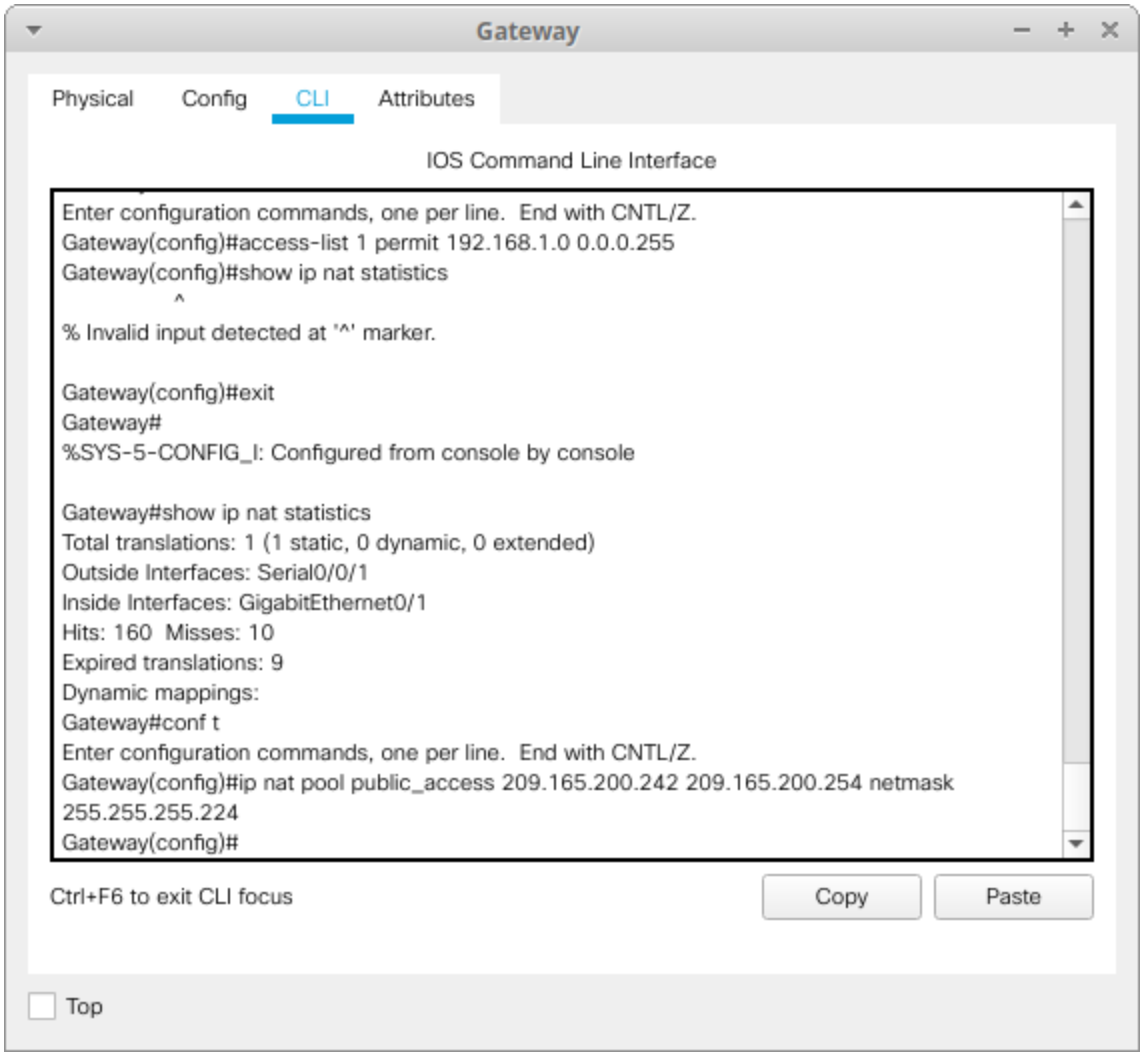


Step 2: Define an access control list (ACL) that matches the LAN private IP address range.

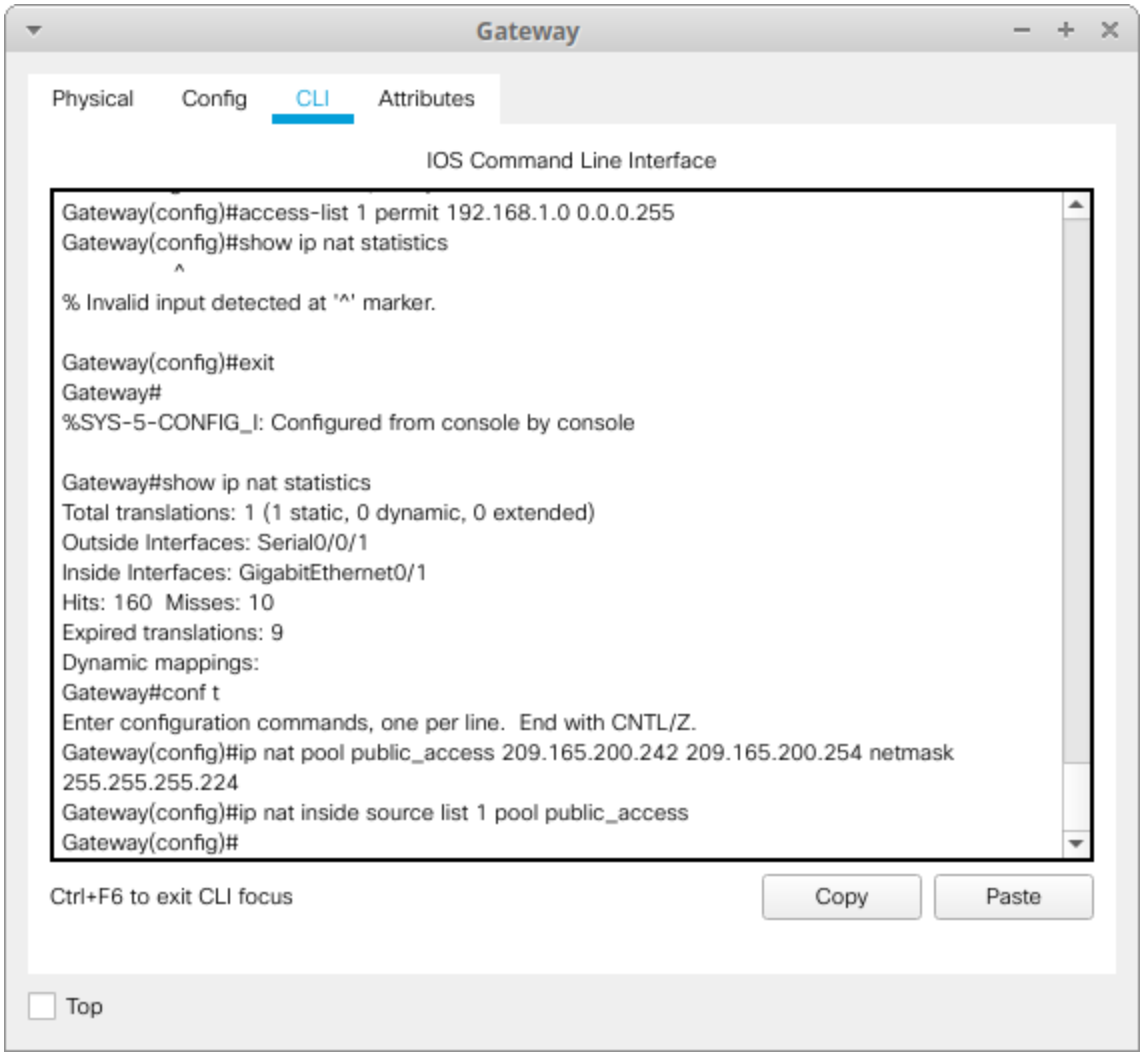
Step 3: Verify that the NAT interface configurations are still valid.



Step 4: Define the pool of usable public IP addresses.

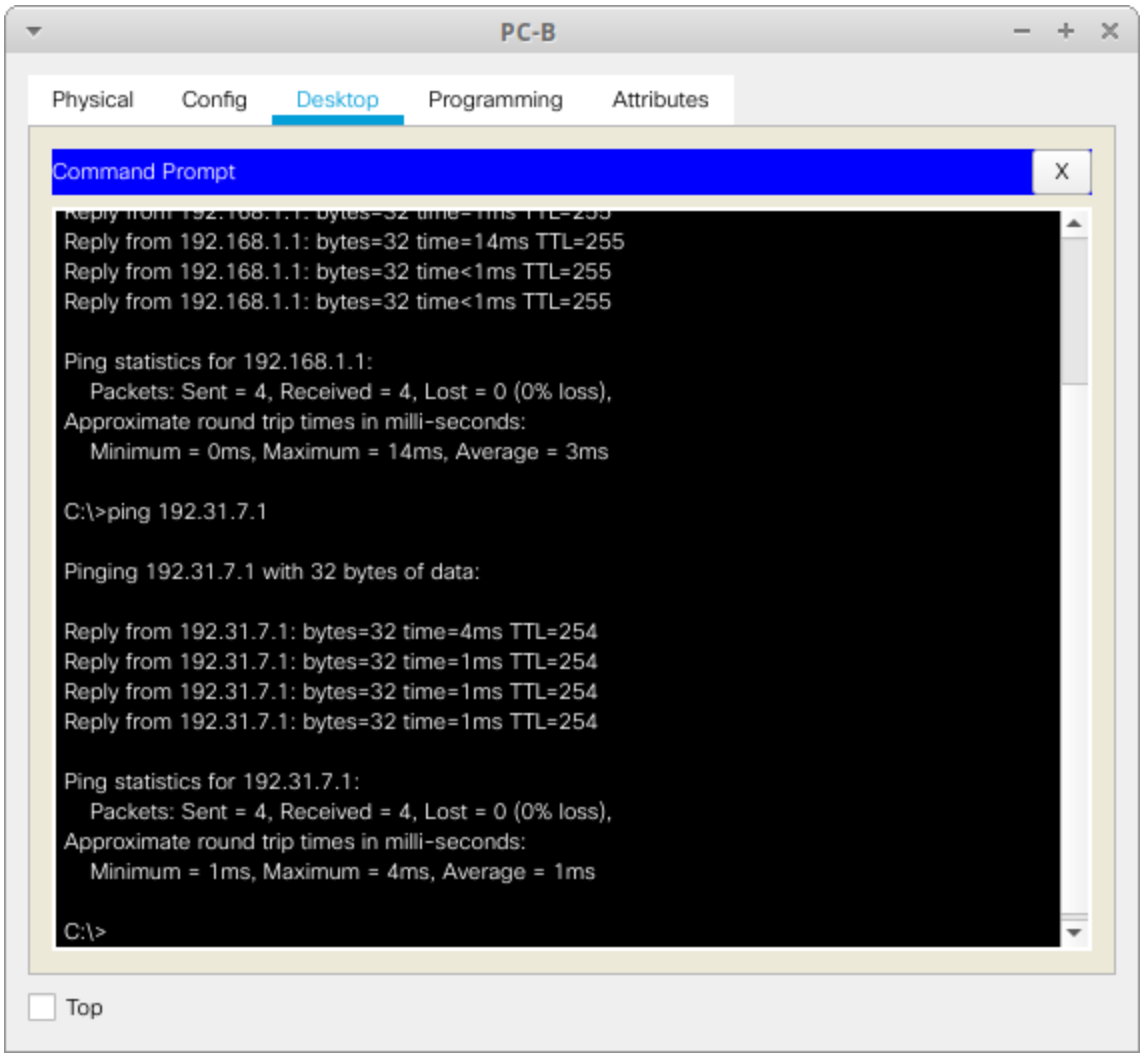


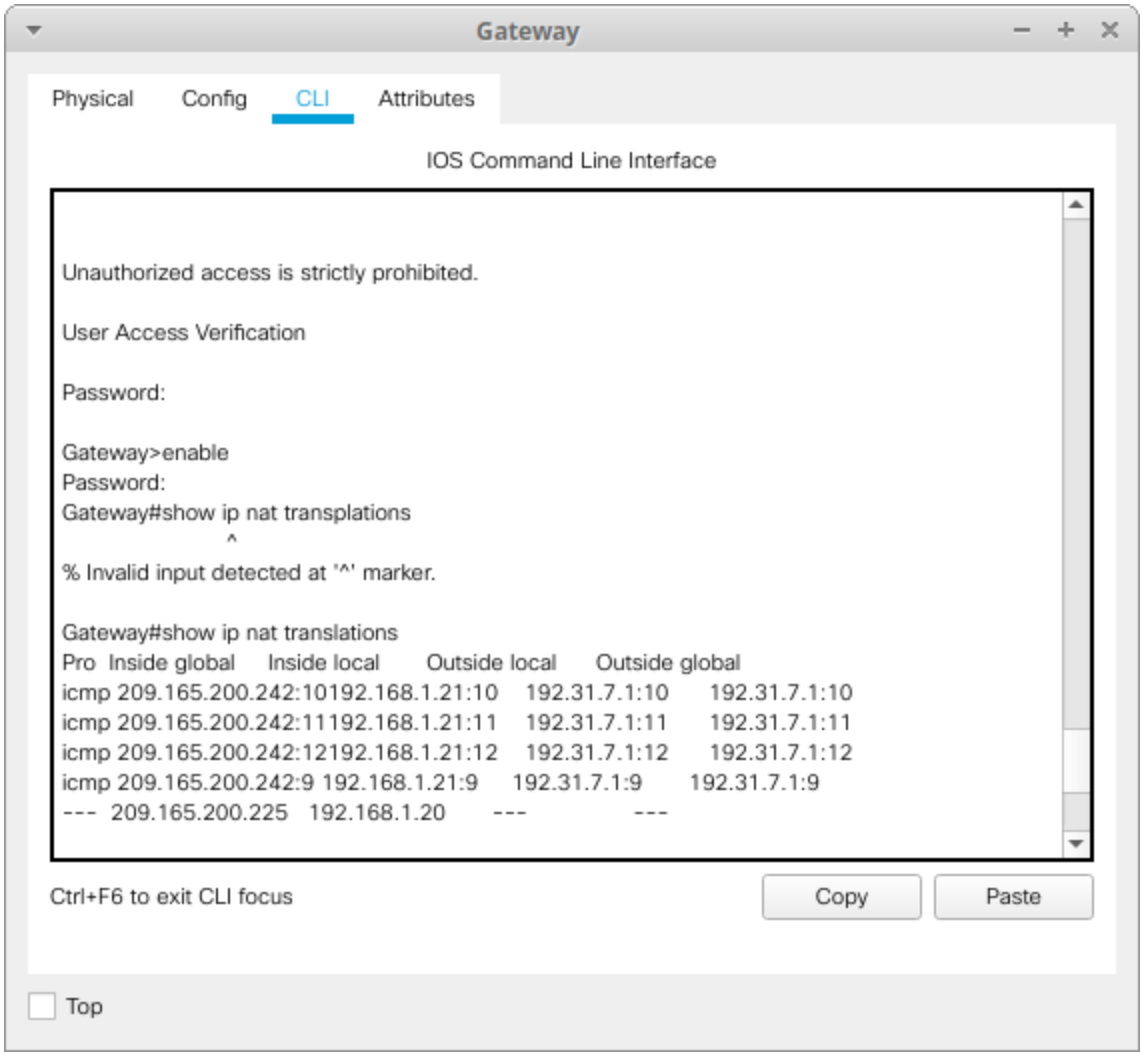
Step 5: Define the NAT from the inside source list to the outside pool.


Gateway
Physical
Config
CLI
Attributes
IOS Command Line Interface
Gateway(config)#access-list 1 permit 192.168.1.0 0.0.0.255
Gateway(config)#show ip nat statistics
^
% Invalid input detected at '^' marker.
Gateway(config)#exit
Gateway#
%SYS-5-CONFIG_I: Configured from console by console
Gateway#show ip nat statistics
Total translations: 1 (1 static, 0 dynamic, 0 extended)
Outside Interfaces: Serial0/0/1
Inside Interfaces: GigabitEthernet0/1
Hits: 160 Misses: 10
Expired translations: 9
Dynamic mappings:
Gateway#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Gateway(config)#ip nat pool public_access 209.165.200.242 209.165.200.254 netmask
255.255.255.224
Gateway(config)#ip nat inside source list 1 pool public_access
Gateway(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

Step 6: Test the configuration.

a. From PC-B, ping the Lo0 interface (192.31.7.1) on ISP. If the ping was unsuccessful, troubleshoot and correct the issues. On the Gateway router, display the NAT table.

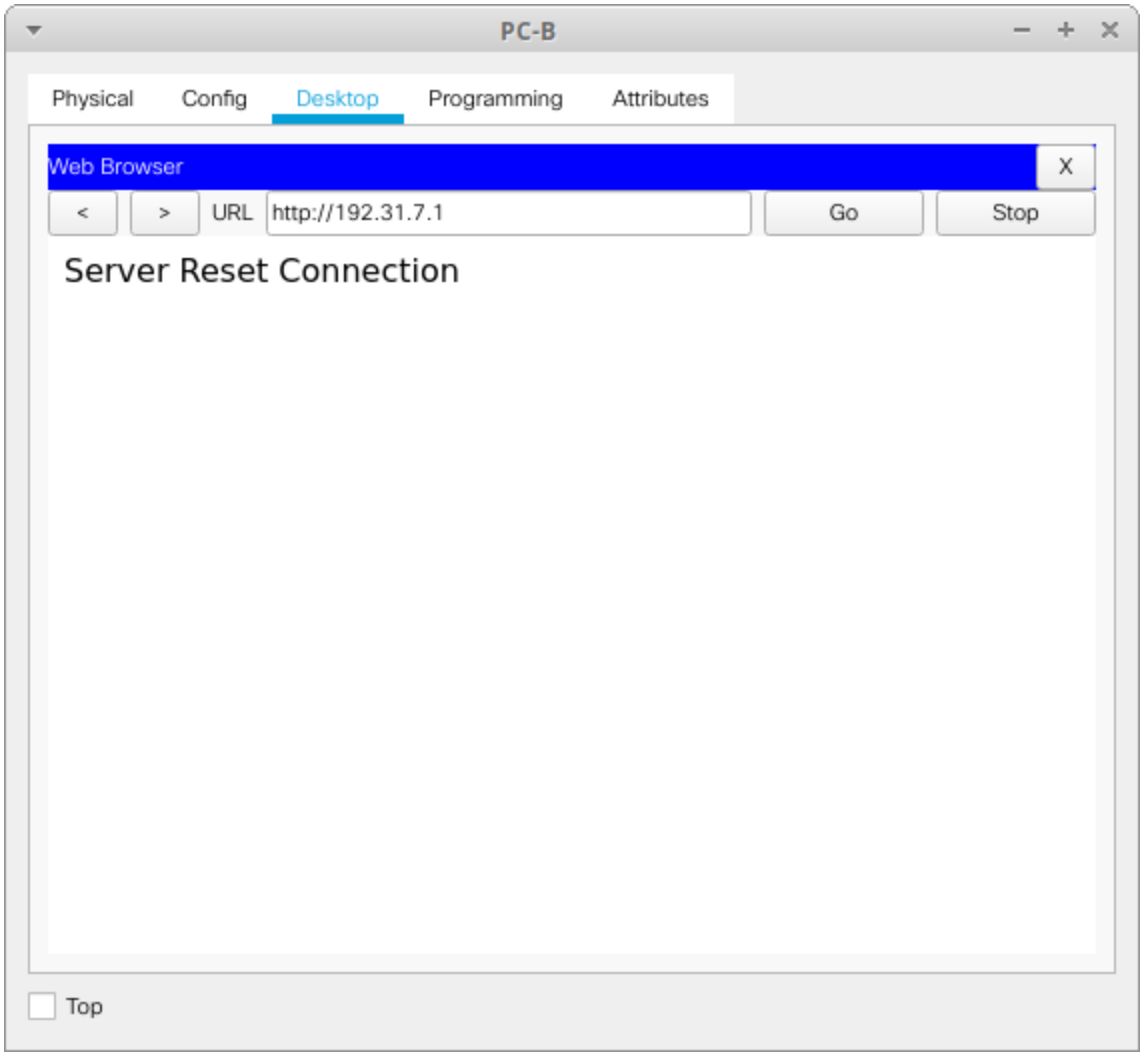




What is the translation of the Inside local host address for PC-B?
192.168.1.21 = **209.165.200.242**

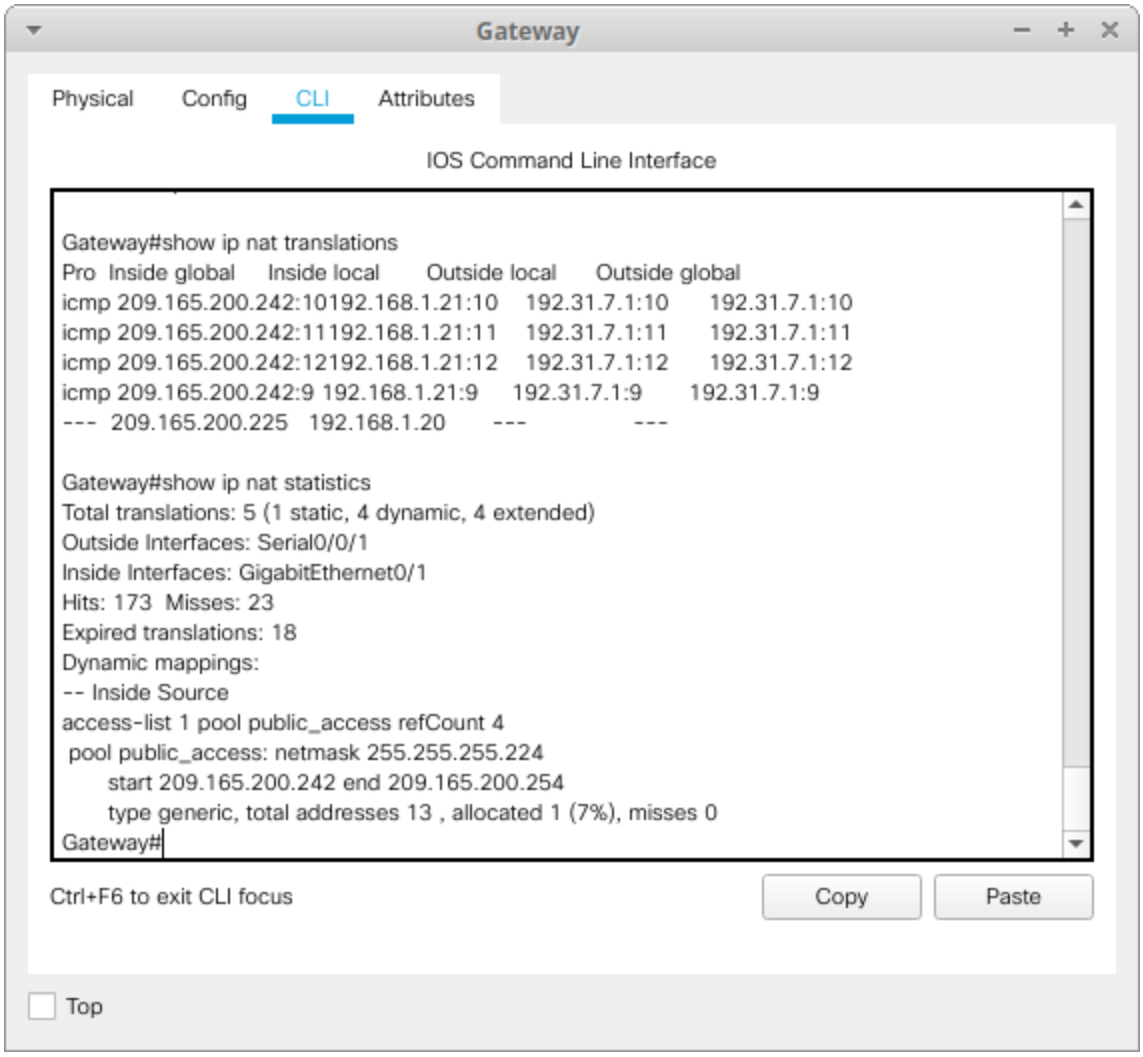
What port number was used in this ICMP exchange?
5,6,7,8

b. Cannot implement



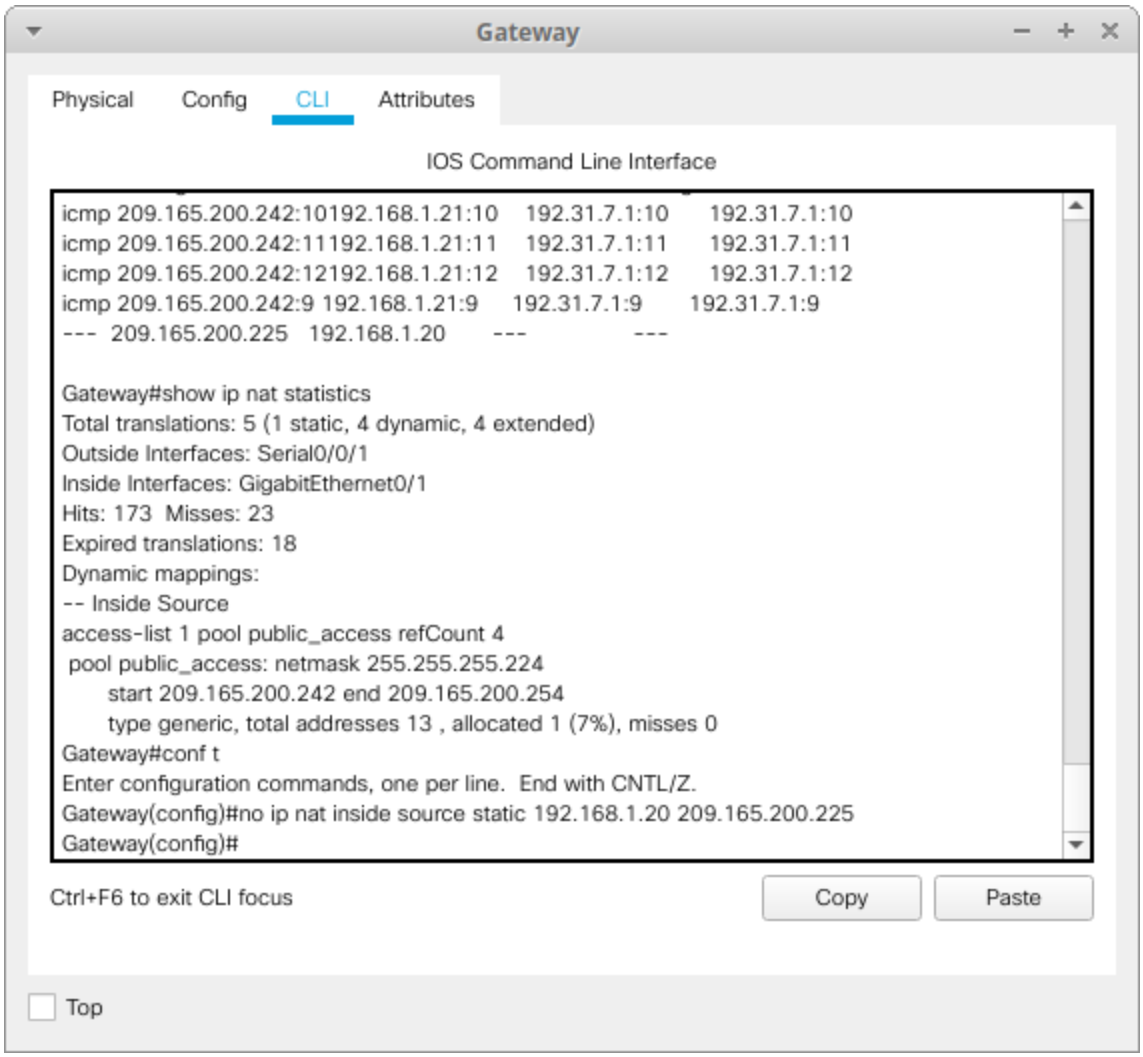
c. Cannot implement

d. Verify NAT statistics by using the show ip nat statistics command on the Gateway router.

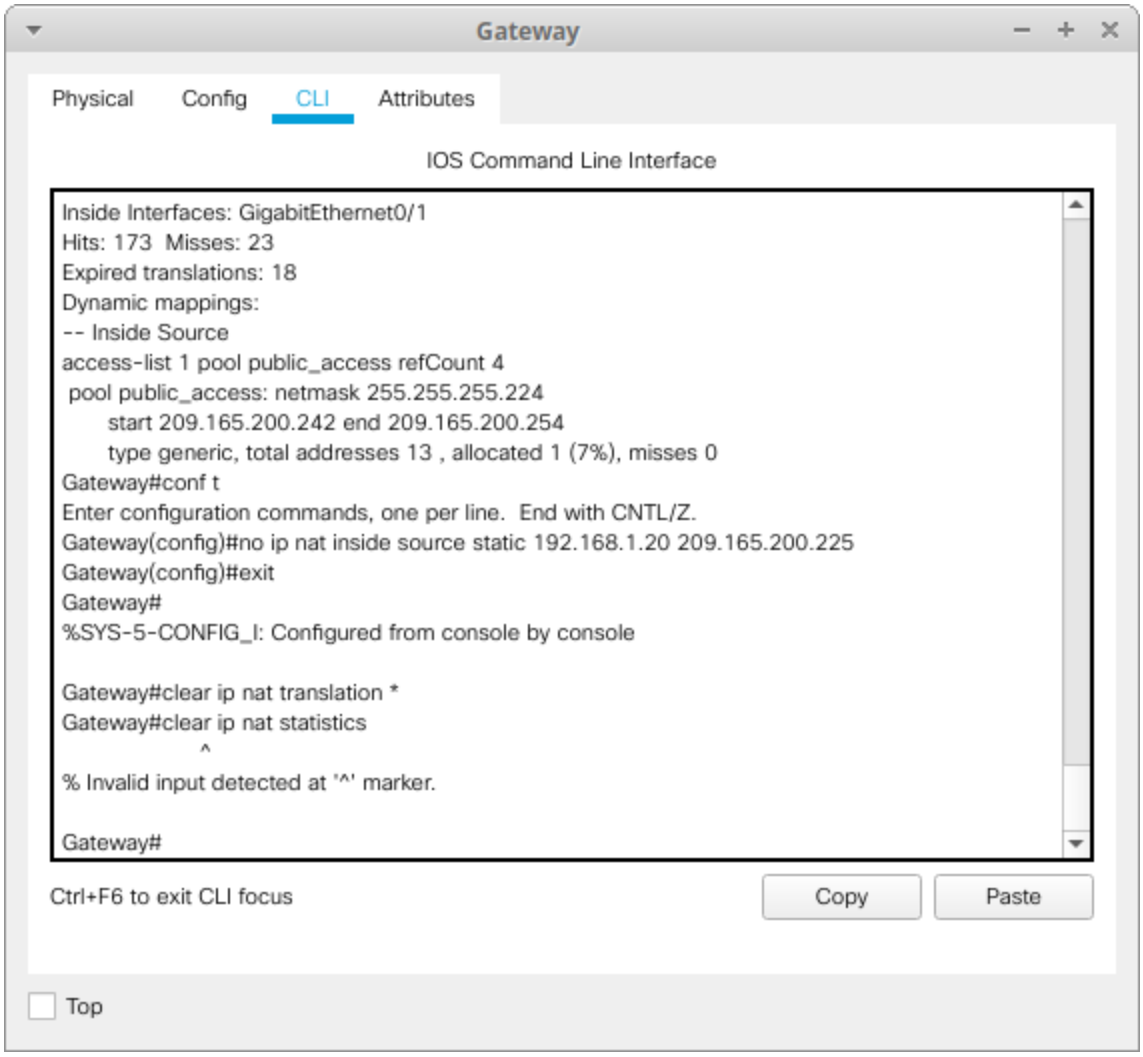


Step 7: Remove the static NAT entry.

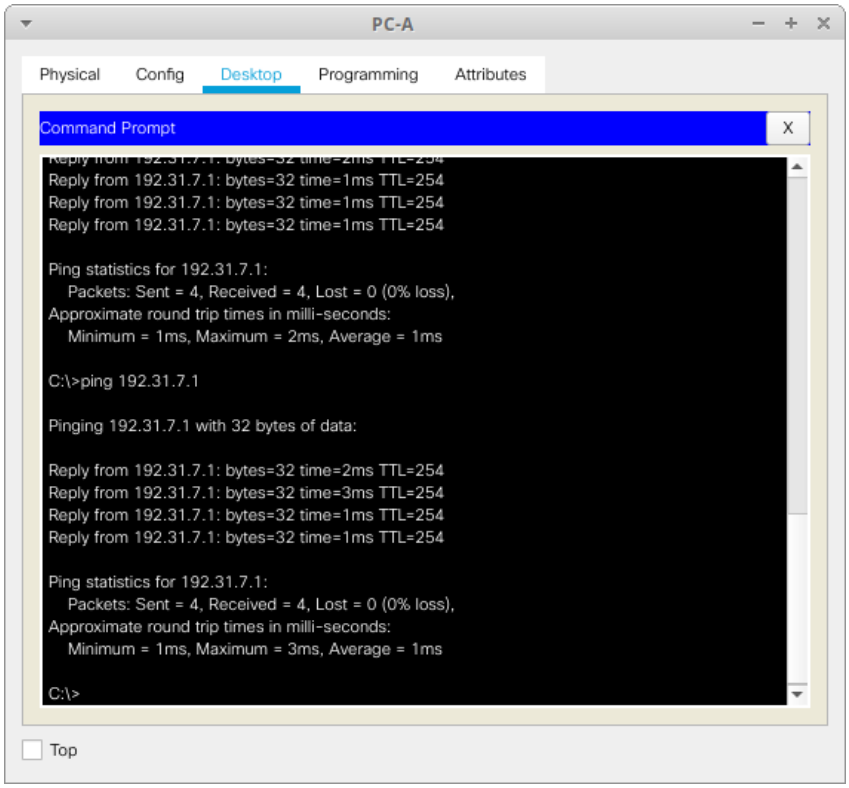
a. Remove the static NAT from Part 2.

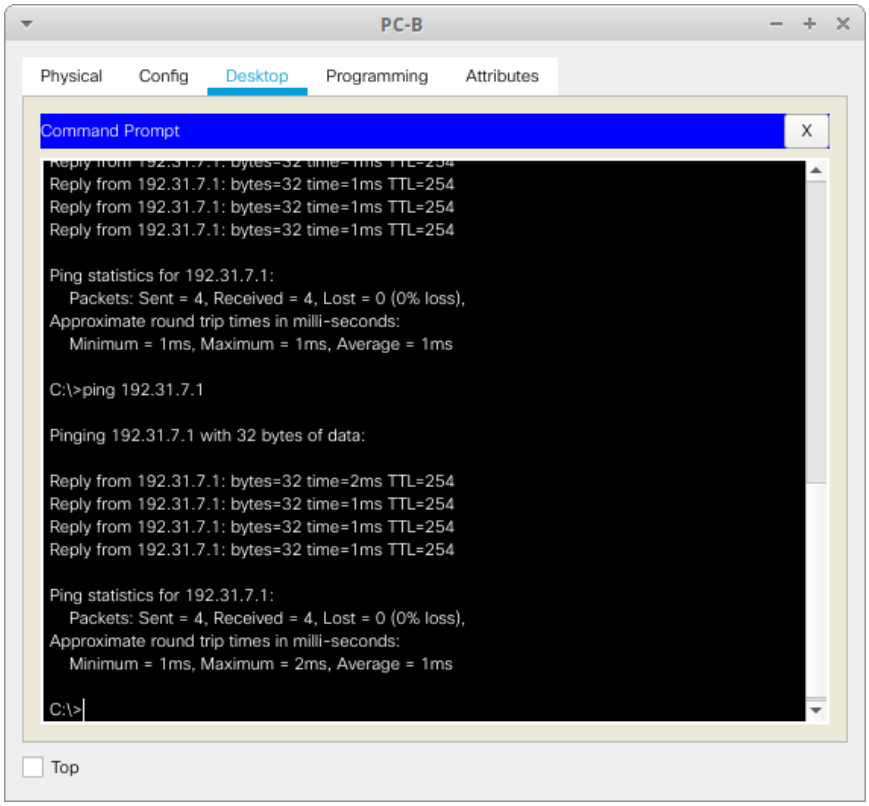


b. Clear the NATs and statistics



c. Ping the ISP (192.31.7.1) from both hosts.





d. Display the NAT table and statistics.