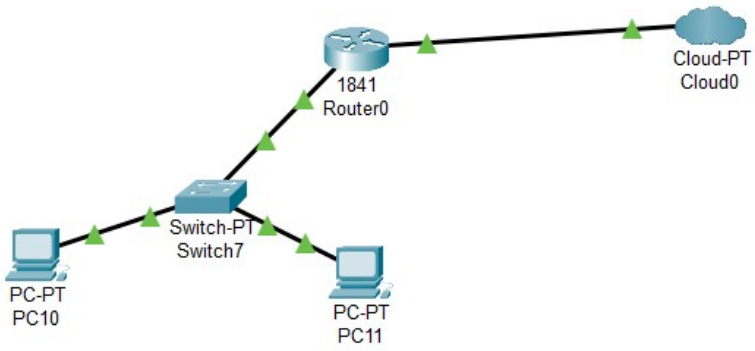
Network address translation (NAT) process in which one or more local ip addresses in a network are translated to global ip addresses and vice-versa to provide internet access to local hosts.

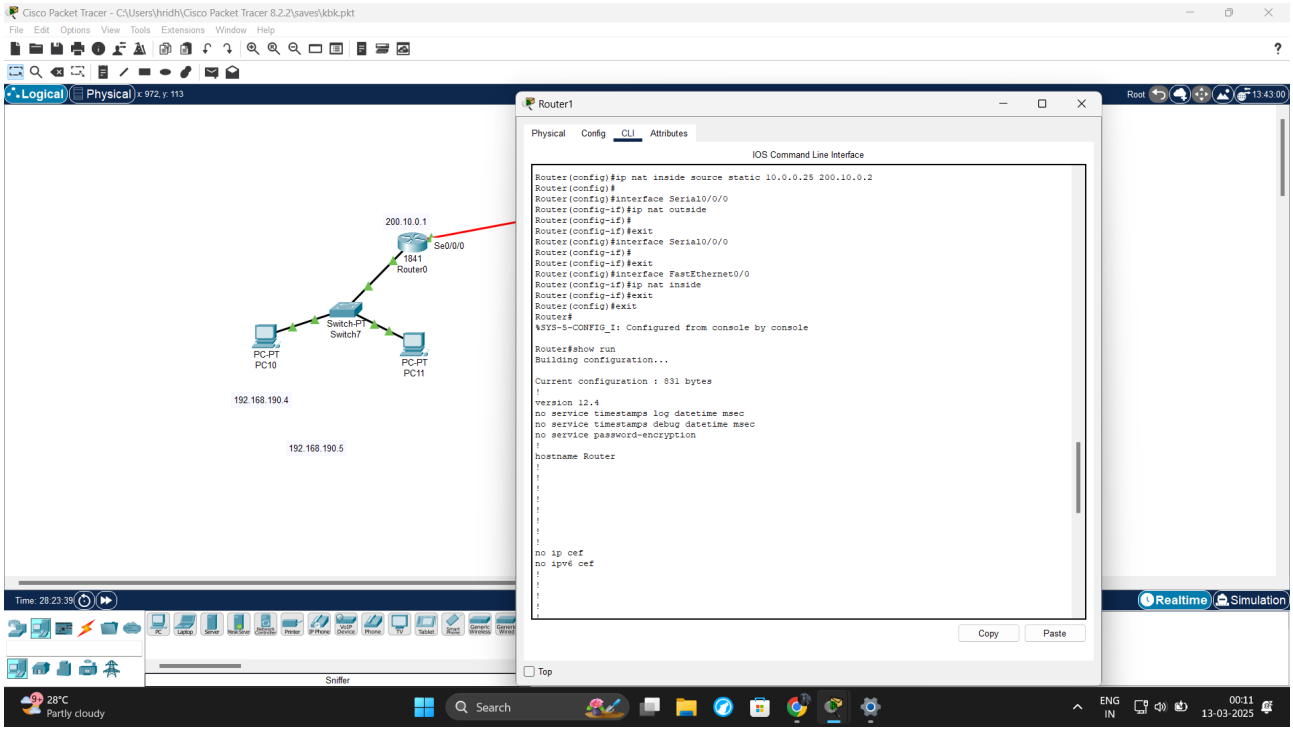
Working of NAT:

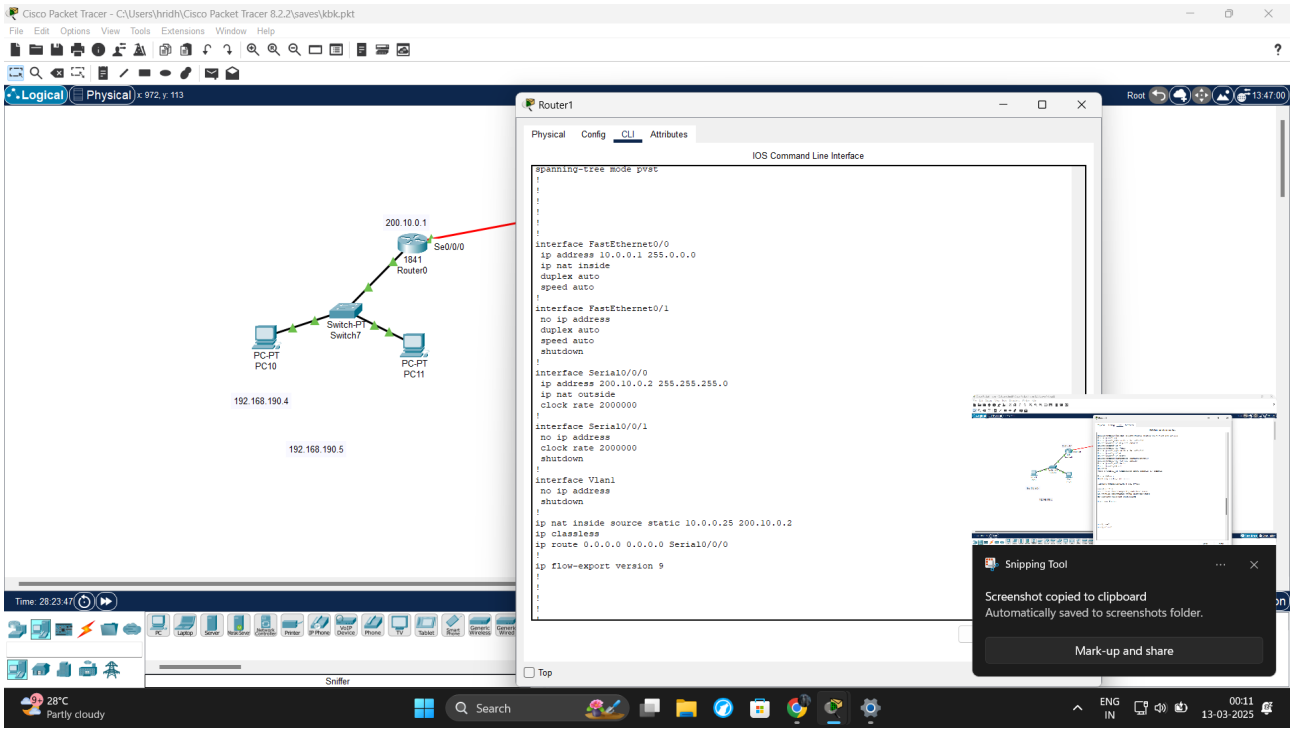
1) The router at the border of the network which has one interface connected to the local network and the other interface connected to the internet is configured for NAT.
2) When the packet that is going out of the network, the NAT converts the local ip address of the source to a global ip address.
3) Similarly, when a packet enters the local network, the global (public) IP address is converted to a local (private) IP address.

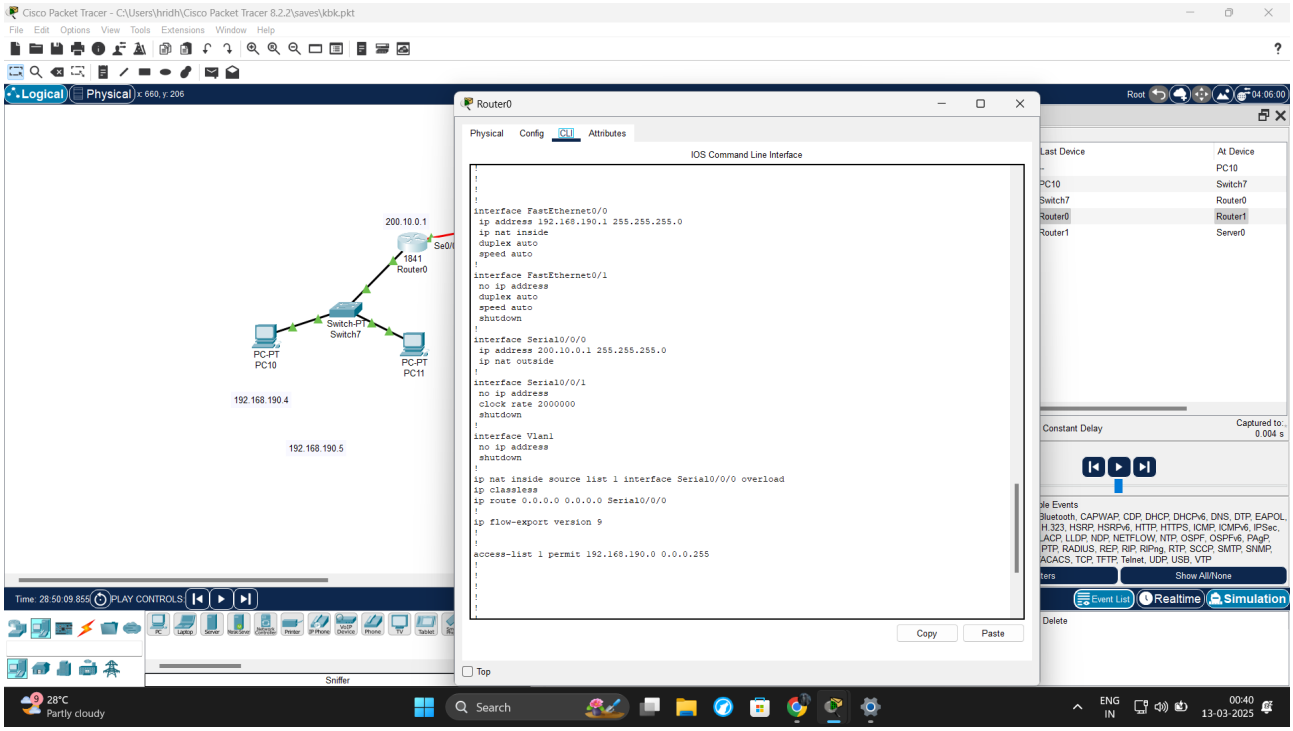
Experiment Configurations:

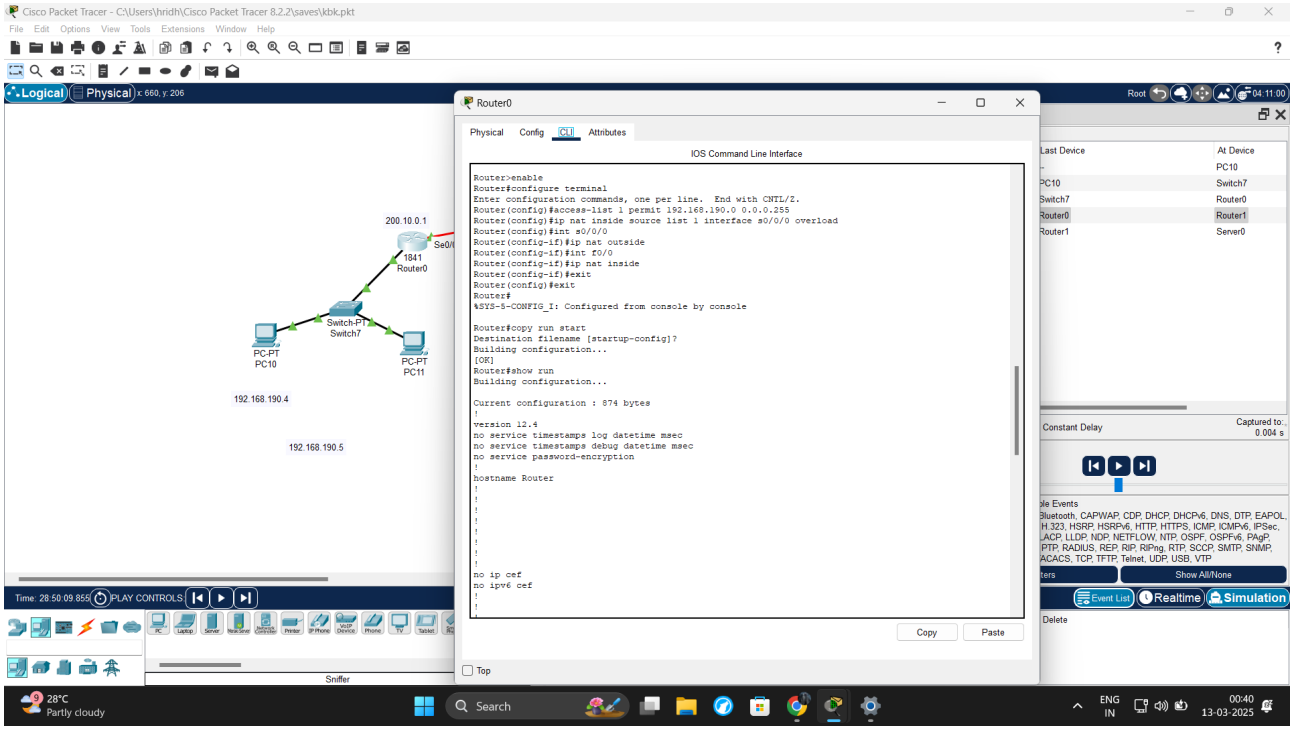
1) Open Cisco Packet Tracer, design and make the connections according to the network in the image.
2) We will be using a server and a router to simulate an outside internet connection since cisco packet tracer can’t connect to real interntet.
3) Configure the ip addresses of the router, end devices and the server in the network.
4) Create an access list and use that access list to configure the NAT.
5) Ping the server from any device in the network and capture using simulation mode of Cisco Packet Tracer to the see the packet details.

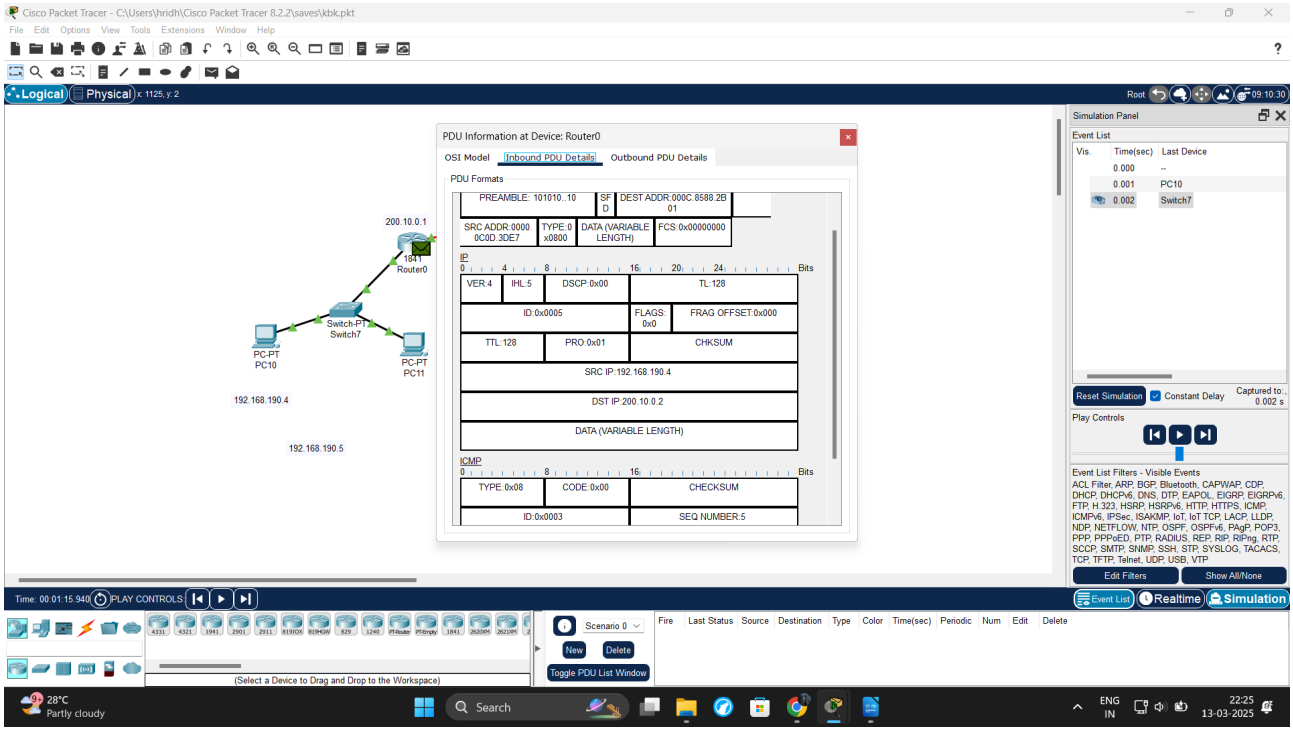


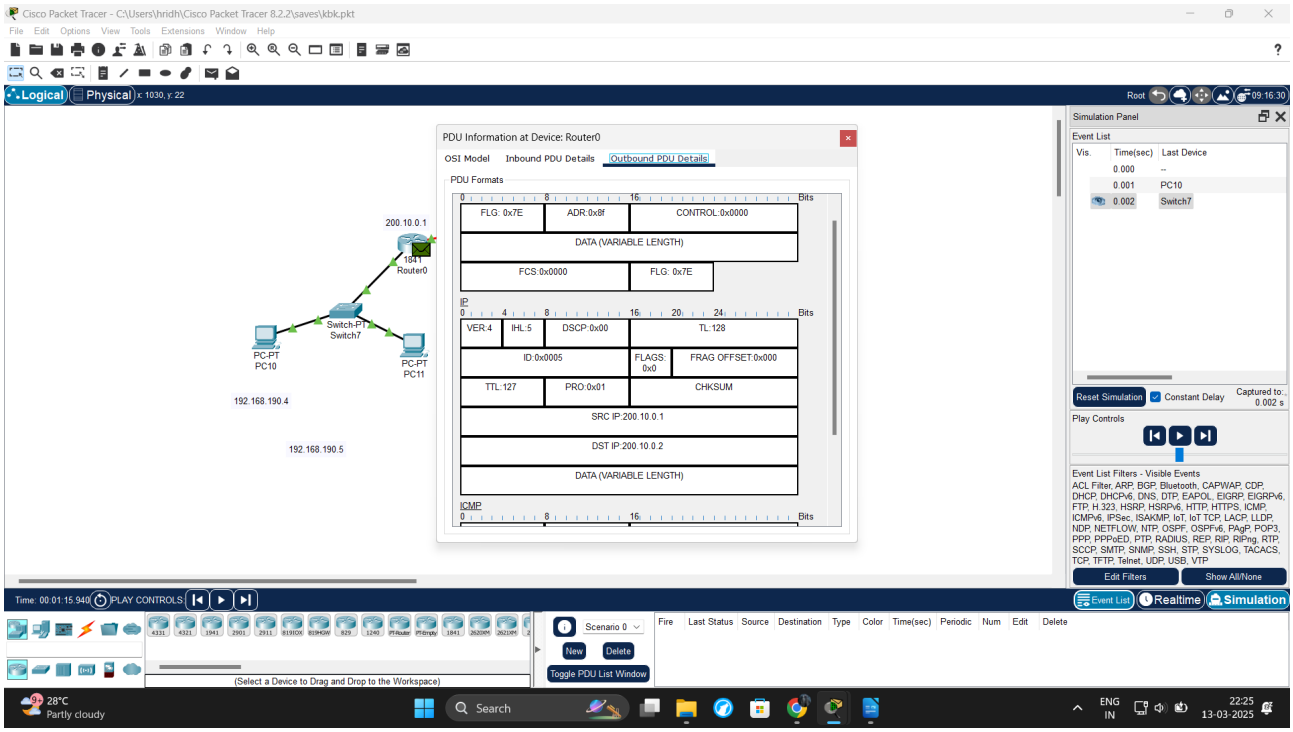

Cisco Packet Tracer - C:\Users\hridh\Cisco Packet Tracer 8.2.2\saves\kbk.pkt
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#ip nat inside source static 10.0.0.25 200.10.0.2
Router(config)#
Router(config)#interface Serial0/0/0
Router(config-if)#ip nat outside
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show run
Building configuration...
Current configuration : 831 bytes
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Router
no ip cef
no ipv6 cef
Copy
Paste
Top
200.10.0.1
Se0/0/0
1841
Router0
Switch-PT
Switch7
PC-PT
PC10
PC-PT
PC11
192.168.190.4
192.168.190.5
Logical
Physical
Realtime
Simulation
Sniffer
Search
28°C
Partly cloudy
ENG
IN
00:11
13-03-2025

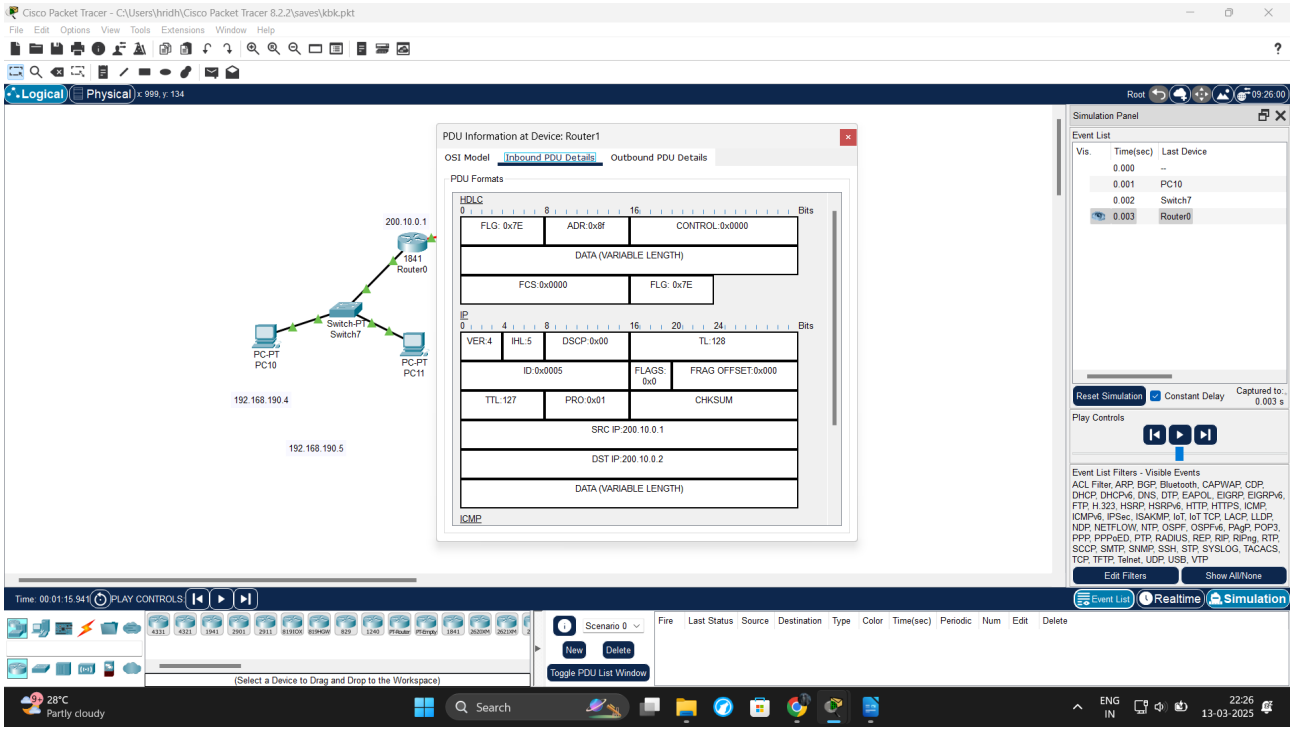

Cisco Packet Tracer - C:\Users\hridh\Cisco Packet Tracer 8.2.2\saves\kbk.pkt
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
spanning-tree mode pvst
interface FastEthernet0/0
ip address 10.0.0.1 255.0.0.0
ip nat inside
duplex auto
speed auto
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
interface Serial0/0/0
ip address 200.10.0.2 255.255.255.0
ip nat outside
clock rate 2000000
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
interface Vlan1
no ip address
shutdown
ip nat inside source static 10.0.0.25 200.10.0.2
ip classless
ip route 0.0.0.0 0.0.0.0 Serial0/0/0
ip flow-export version 9
Top
Snipping Tool
Screenshot copied to clipboard
Automatically saved to screenshots folder.
Mark-up and share
200.10.0.1
Se0/0/0
1841
Router0
Switch-PT
Switch7
PC-PT
PC10
PC-PT
PC11
192.168.190.4
192.168.190.5
Logical
Physical
Sniffer
Search
28°C
Partly cloudy
ENG
IN
00:11
13-03-2025

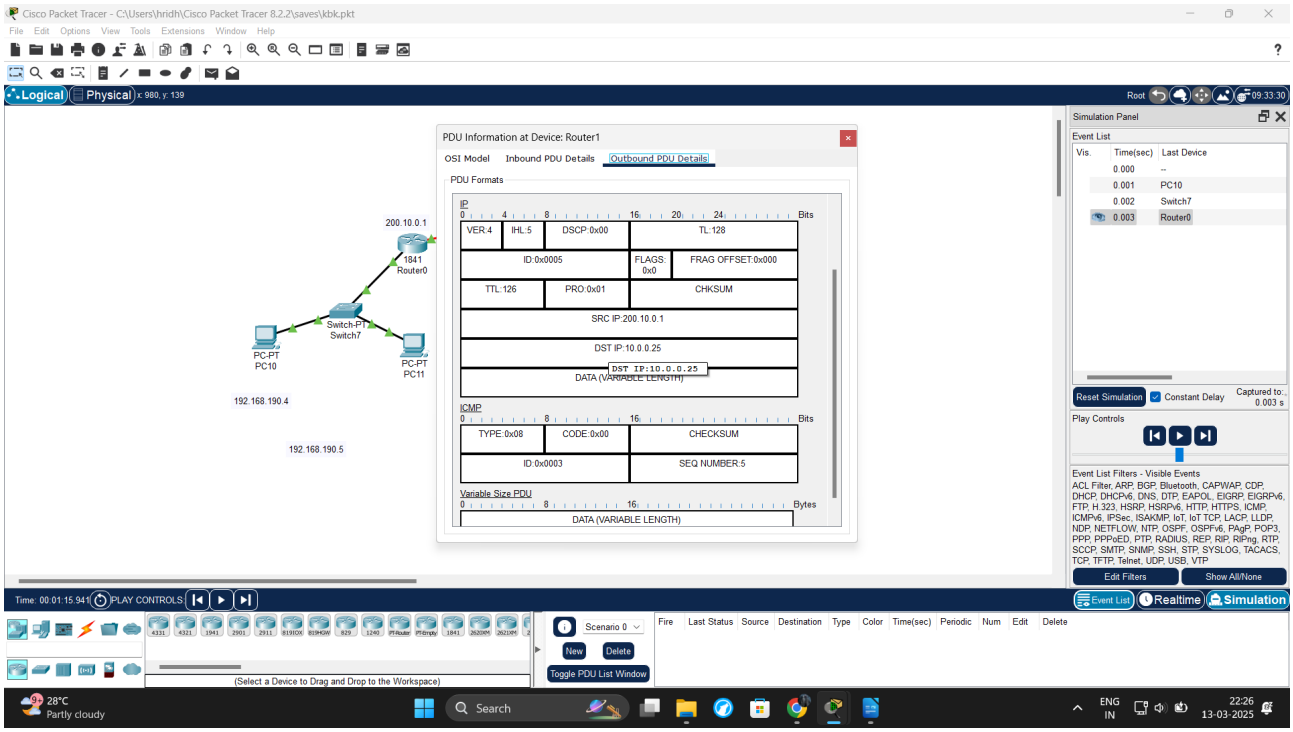

Cisco Packet Tracer - C:\Users\hridh\Cisco Packet Tracer 8.2.2\saves\kbk.pkt
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
interface FastEthernet0/0
ip address 192.168.190.1 255.255.255.0
ip nat inside
duplex auto
speed auto
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
interface Serial0/0/0
ip address 200.10.0.1 255.255.255.0
ip nat outside
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
interface Vlan1
no ip address
shutdown
ip nat inside source list 1 interface Serial0/0/0 overload
ip classless
ip route 0.0.0.0 0.0.0.0 Serial0/0/0
ip flow-export version 9
access-list 1 permit 192.168.190.0 0.0.0.255
Copy
Paste
Top
200.10.0.1
1841
Router0
Switch-PT
Switch7
PC-PT
PC10
PC-PT
PC11
192.168.190.4
192.168.190.5
Time: 28:50:09.855
PLAY CONTROLS
Sniffer
Logical
Physical
Root
Last Device
At Device
PC10
Switch7
Router0
Router1
Server0
Constant Delay
Captured to:
0.004 s
Event List
Realtime
Simulation
Delete
28°C
Partly cloudy
Search
ENG
IN
00:40
13-03-2025


Cisco Packet Tracer - C:\Users\hridh\Cisco Packet Tracer 8.2.2\saves\kbk.pkt
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#access-list 1 permit 192.168.190.0 0.0.0.255
Router(config)#ip nat inside source list 1 interface s0/0/0 overload
Router(config)#int s0/0/0
Router(config-if)#ip nat outside
Router(config-if)#int f0/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#show run
Building configuration...
Current configuration : 874 bytes
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Router
no ip cef
no ipv6 cef
Copy
Paste
Top
200.10.0.1
1841
Router0
Switch-PT
Switch7
PC-PT
PC10
PC-PT
PC11
192.168.190.4
192.168.190.5
Time: 28:50:09.855
PLAY CONTROLS
Sniffer
Logical
Physical
Root
Last Device
At Device
PC10
Switch7
Router0
Router1
Server0
Constant Delay
Captured to:
0.004 s
Event List
Realtime
Simulation
Delete
28°C
Partly cloudy
Search
ENG
IN
00:40
13-03-2025


Cisco Packet Tracer - C:\Users\hridh\Cisco Packet Tracer 8.2.2\saves\kbk.pkt
Logical
Physical
PDU Information at Device: Router0
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
PREAMBLE: 10101010..10
SFD
DEST ADDR:000C.8588.2B01
SRC ADDR:0000.0C0D.3DE7
TYPE:0x0800
DATA (VARIABLE LENGTH)
FCS:0x00000000
IP
VER:4
IHL:5
DSCP:0x00
TL:128
ID:0x0005
FLAGS:0x0
FRAG OFFSET:0x000
TTL:128
PRO:0x01
CHKSUM
SRC IP:192.168.190.4
DST IP:200.10.0.2
DATA (VARIABLE LENGTH)
ICMP
TYPE:0x08
CODE:0x00
CHECKSUM
ID:0x0003
SEQ NUMBER:5
200.10.0.1
1841
Router0
Switch-PT
Switch7
PC-PT
PC10
PC-PT
PC11
192.168.190.4
192.168.190.5
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
0.001
PC10
0.002
Switch7
Reset Simulation
Constant Delay
Captured to:
0.002 s
Play Controls
Event List Filters - Visible Events
Edit Filters
Show All/None
Time: 00:01:15.940
PLAY CONTROLS
Event List
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
28°C
Partly cloudy
Search
ENG
IN
22:25
13-03-2025


Cisco Packet Tracer - C:\Users\hridh\Cisco Packet Tracer 8.2.2\saves\kbk.pkt
Logical
Physical
PDU Information at Device: Router0
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
FLG: 0x7E
ADR:0x8f
CONTROL:0x0000
DATA (VARIABLE LENGTH)
FCS:0x0000
FLG: 0x7E
IP
VER:4
IHL:5
DSCP:0x00
TL:128
ID:0x0005
FLAGS:0x0
FRAG OFFSET:0x000
TTL:127
PRO:0x01
CHKSUM
SRC IP:200.10.0.1
DST IP:200.10.0.2
DATA (VARIABLE LENGTH)
ICMP
200.10.0.1
1841
Router0
Switch-PT
Switch7
PC-PT
PC10
PC-PT
PC11
192.168.190.4
192.168.190.5
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
0.001
PC10
0.002
Switch7
Reset Simulation
Constant Delay
Captured to:
0.002 s
Play Controls
Event List Filters - Visible Events
Edit Filters
Show All/None
Time: 00:01:15.940
PLAY CONTROLS
Event List
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
28°C
Partly cloudy
Search
ENG
IN
22:25
13-03-2025


Cisco Packet Tracer - C:\Users\hridh\Cisco Packet Tracer 8.2.2\saves\kbk.pkt
Logical
Physical
PDU Information at Device: Router1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
HDLC
FLG: 0x7E
ADR:0x8f
CONTROL:0x0000
DATA (VARIABLE LENGTH)
FCS:0x0000
FLG: 0x7E
IP
VER:4
IHL:5
DSCP:0x00
TL:128
ID:0x0005
FLAGS: 0x0
FRAG OFFSET:0x000
TTL:127
PRO:0x01
CHKSUM
SRC IP:200.10.0.1
DST IP:200.10.0.2
DATA (VARIABLE LENGTH)
ICMP
200.10.0.1
1841
Router0
Switch-PT
Switch7
PC-PT
PC10
PC-PT
PC11
192.168.190.4
192.168.190.5
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Edit Filters
Show All/None
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
(Select a Device to Drag and Drop to the Workspace)
28°C
Partly cloudy
Search
ENG
IN
22:26
13-03-2025


Cisco Packet Tracer - C:\Users\hridh\Cisco Packet Tracer 8.2.2\saves\kbk.pkt
Logical
Physical
PDU Information at Device: Router1
OSI Model
Inbound PDU Details
Outbound PDU Details
PDU Formats
IP
VER:4
IHL:5
DSCP:0x00
TL:128
ID:0x0005
FLAGS: 0x0
FRAG OFFSET:0x000
TTL:126
PRO:0x01
CHKSUM
SRC IP:200.10.0.1
DST IP:10.0.0.25
DST IP:10.0.0.25
DATA (VARIABLE LENGTH)
ICMP
TYPE:0x08
CODE:0x00
CHECKSUM
ID:0x0003
SEQ NUMBER:5
Variable Size PDU
DATA (VARIABLE LENGTH)
200.10.0.1
1841
Router0
Switch-PT
Switch7
PC-PT
PC10
PC-PT
PC11
192.168.190.4
192.168.190.5
Simulation Panel
Event List
Reset Simulation
Constant Delay
Play Controls
Edit Filters
Show All/None
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
(Select a Device to Drag and Drop to the Workspace)
28°C
Partly cloudy
Search
ENG
IN
22:26
13-03-2025