



Lab Number: 11

Date: 2025/08/17

Title: Implementing ACL in Packet Tracer

Theory:

- a. **ACLs:** Access Control Lists (ACLs) are used to manage and control network traffic. They work by examining the IP addresses, protocols, and port numbers to determine whether to allow or block traffic. ACLs enhance network security by enforcing rules that either permit or deny traffic based on specific criteria. There are two main types of ACLs:
- **Standard ACLs:** These focus solely on the source IP address to control traffic.
 - **Extended ACLs:** These offer more detailed control by evaluating both source and destination IP addresses, as well as protocols and port numbers.

b. Network Diagram

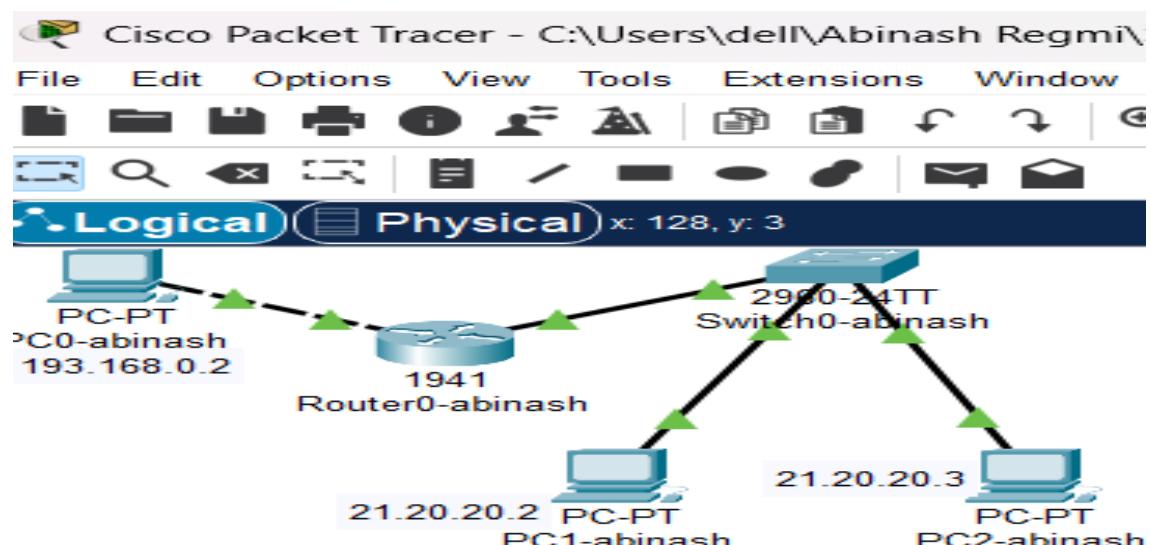


Fig: Network diagram including switch, router and pc's

Implementation Sequence

Here is the implementation sequence for Basic router configuration and static routing in Packet Tracer.

a) Configuring PCs and Routers

i. Configure PCs

Step 1: Open Packet Tracer and set up the devices.

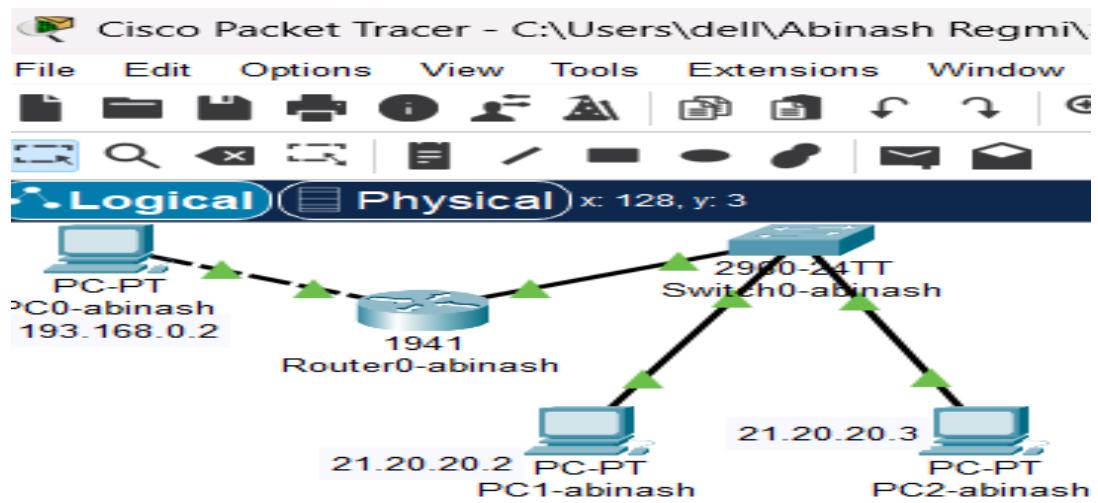


Fig: Simple Network Setup

Step 2: Assign IP addresses and subnet masks to each PC

- PC0-abinash: IP:193.168.0.2
- PC1-abinash: IP:21.20.20.2
- PC2-abinash: IP:21.20.20.3

PC0-abinash	
Physical Config Desktop Programming Attributes	
IP Configuration	
Interface	FastEthernet0
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	193.168.0.2
Subnet Mask	255.255.255.0
Default Gateway	193.168.0.1
DNS Server	0.0.0.0

PC1-abinash	
Physical Config Desktop Programming Attributes	
IP Configuration	
Interface	FastEthernet0
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	21.20.20.2
Subnet Mask	255.0.0.0
Default Gateway	21.20.20.1
DNS Server	0.0.0.0

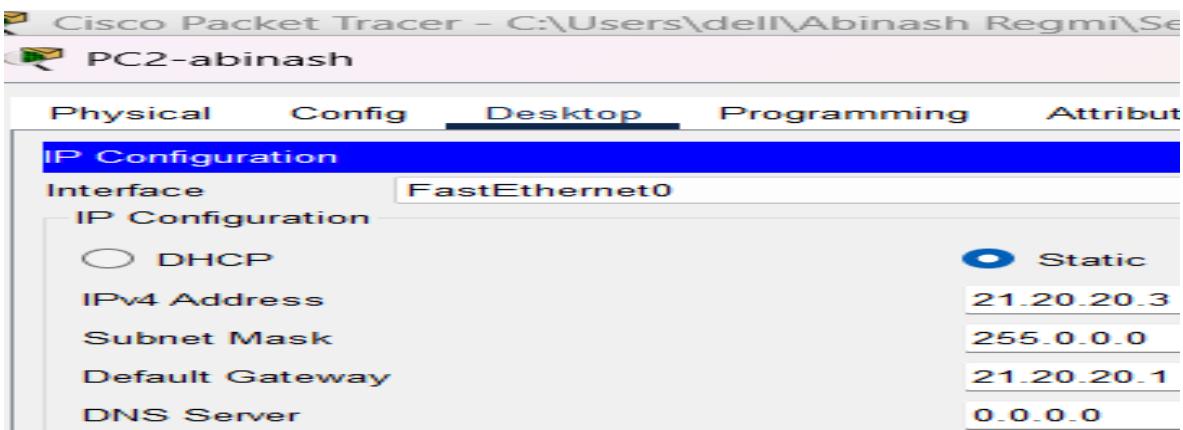


Fig: IP configuration on PCs

ii. Configure Router

Step 1: Configure the router with the correct IP addresses on its interfaces to connect the PC's networks.

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#shutdown
Router(config-if)#ip address 193.168.0.1 255.255.255.0
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)#interface GigabitEthernet0/1
Router(config-if)#shutdown
Router(config-if)#ip address 21.20.20.1 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
  
```

Fig: Router configuration

The figure shows the configuration of a router's interfaces to connect different PC networks. The router is assigned IP addresses to its interfaces: 193.168.0.1 for GigabitEthernet0/0 and 21.20.20.1 for GigabitEthernet0/1. After assigning IPs, the interfaces are enabled using the no shutdown command, bringing them into an operational state for network communication.

b) Configuring Access List

I. Configure the DENY and PERMIT lists

Step 1: Enter Global Configuration Mode and Apply the ACL

- Access the router's global configuration mode to configure and apply the Access Control List (ACL) to the interface connected to the PC. This will block the network access for the PC.

```
Router (config-if) #exit
Router (config) #access-list 1 deny host 21.20.20.2
Router (config) #access-list 1 permit host 21.20.20.3
Router (config) #interface GigabitEthernet0/1
Router (config-if) #ip access-group 1 in
Router (config-if) #exit
```

Fig: Configuring DENY and PERMIT list

c) Implementation

To verify network functionality, we should test connectivity between devices by using ping commands from each PC.

- Apply the ACLs to the relevant router interfaces.
- Use the ping command to check if the PCs can communicate with each other.
- Ensure that the ACL rules (DENY and PERMIT) are correctly enforced by observing the ping results.

```
Cisco Packet Tracer - C:\Users\dell\Abinash Regmi\Semester-IV\CN
PC0-abinash
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:>ping 21.20.20.2

Pinging 21.20.20.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 21.20.20.2:
  Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC0-abinash
Physical Config Desktop Programming Attributes
Command Prompt
C:>ping 21.20.20.3

Pinging 21.20.20.3 with 32 bytes of data:

Reply from 21.20.20.3: bytes=32 time=9ms TTL=128
Reply from 21.20.20.3: bytes=32 time=5ms TTL=128
Reply from 21.20.20.3: bytes=32 time=4ms TTL=128
Reply from 21.20.20.3: bytes=32 time=2ms TTL=128

Ping statistics for 21.20.20.3:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 9ms, Average = 5ms
```

Fig: Connectivity test between PC's

Above figure shows connectivity tests between two PCs using ping commands. The first ping to IP address 21.20.20.2 fails, indicating that access is denied (possibly due to an ACL rule). The second ping to 21.20.20.3 succeeds, showing a successful communication between the devices, indicating that the connection is permitted by the ACL. The results demonstrate that the ACLs are correctly applied to control traffic.

Addressing Table:

The addressing table of this lab is as follows:

Device	Interface	IPv4 Address	Subnet
PC0	NIC	193.168.0.2	255.255.255.0
PC1	NIC	21.20.20.2	255.0.0.0
PC3	NIC	193.168.1.2	255.255.255.0

Conclusion

In this lab, we implemented ACLs in Cisco Packet Tracer to control network traffic between PCs. By applying DENY and PERMIT rules, we successfully managed traffic flow and restricted access as required. The connectivity tests confirmed that the ACLs were effective, blocking traffic from the specified PC while allowing communication between others. This exercise demonstrated the importance of ACLs in enhancing network security and managing access control.