Packet Tracer - Configure Numbered Standard IPv4 ACLs

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Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.10.1	255.255.255.0	N/A
	G0/1	192.168.11.1	255.255.255.0	
	S0/0/0	10.1.1.1	255.255.255.252	
	S0/0/1	10.3.3.1	255.255.255.252	
R2	G0/0	192.168.20.1	255.255.255.0	N/A
	S0/0/0	10.1.1.2	255.255.255.252	
	S0/0/1	10.2.2.1	255.255.255.252	
R3	G0/0	192.168.30.1	255.255.255.0	N/A
	S0/0/0	10.3.3.2	255.255.255.252	
	S0/0/1	10.2.2.2	255.255.255.252	
PC1	NIC	192.168.10.10	255.255.255.0	192.168.10.1
PC2	NIC	192.168.11.10	255.255.255.0	192.168.11.1
PC3	NIC	192.168.30.10	255.255.255.0	192.168.30.1
WebServer	NIC	192.168.20.254	255.255.255.0	192.168.20.1

Objectives

Part 1: Plan an ACL Implementation

Part 2: Configure, Apply, and Verify a Standard ACL

Background / Scenario

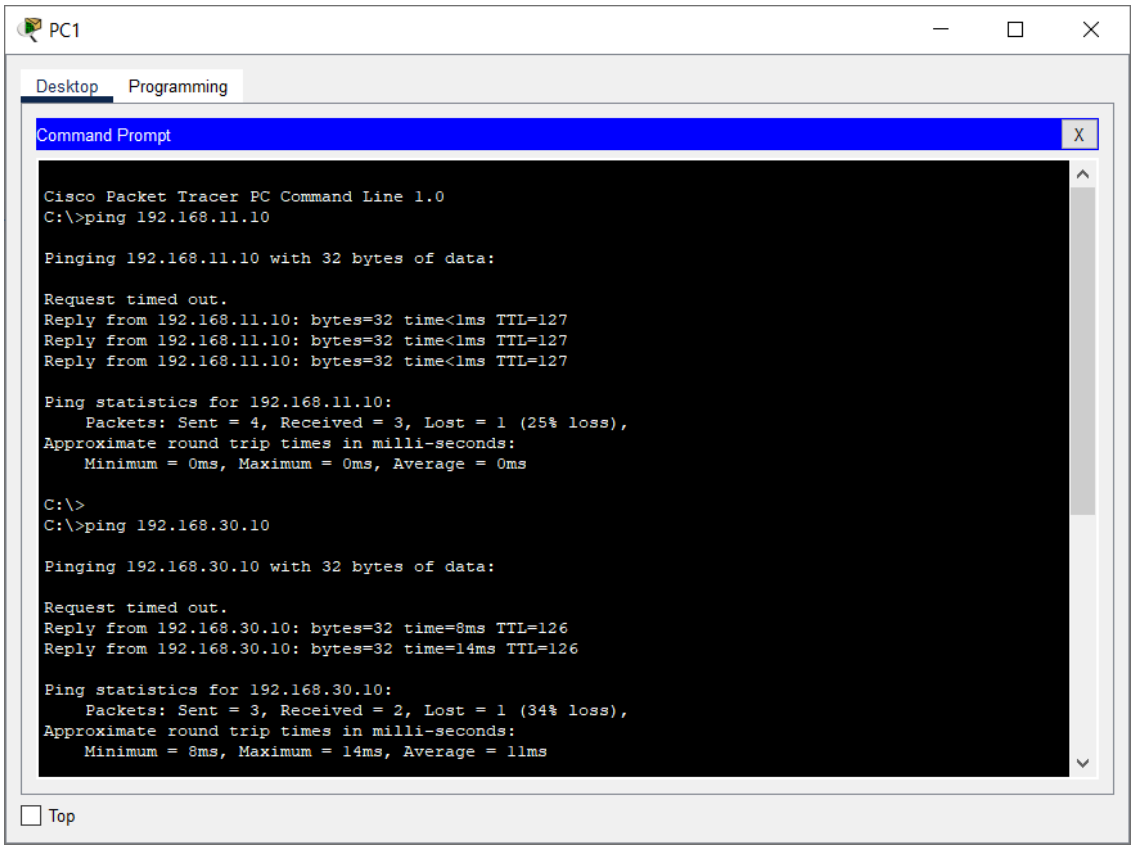
Standard access control lists (ACLs) are router configuration scripts that control whether a router permits or denies packets based on the source address. This activity focuses on defining filtering criteria, configuring standard ACLs, applying ACLs to router interfaces, and verifying and testing the ACL implementation. The routers are already configured, including IP addresses and Enhanced Interior Gateway Routing Protocol (EIGRP) routing.

Instructions

Part 1: Plan an ACL Implementation

Step 1: Investigate the current network configuration.

Before applying any ACLs to a network, it is important to confirm that you have full connectivity. Verify that the network has full connectivity by choosing a PC and pinging other devices on the network. You should be able to successfully ping every device.



Step 2: Evaluate two network policies and plan ACL implementations.

a. The following network policies are implemented on **R2**:

- The 192.168.11.0/24 network is not allowed access to the **WebServer** on the 192.168.20.0/24 network.
- All other access is permitted.

To restrict access from the 192.168.11.0/24 network to the **WebServer** at 192.168.20.254 without interfering with other traffic, an ACL must be created on **R2**. The access list must be placed on the outbound interface to the **WebServer**. A second rule must be created on **R2** to permit all other traffic.

b. The following network policies are implemented on **R3**:

- The 192.168.10.0/24 network is not allowed to communicate with the 192.168.30.0/24 network.
- All other access is permitted.

To restrict access from the 192.168.10.0/24 network to the 192.168.30/24 network without interfering with other traffic, an access list will need to be created on **R3**. The ACL must be placed on the outbound interface to **PC3**. A second rule must be created on **R3** to permit all other traffic.

Part 2: Configure, Apply, and Verify a Standard ACL

Step 1: Configure and apply a numbered standard ACL on R2.

a. Create an ACL using the number **1** on **R2** with a statement that denies access to the 192.168.20.0/24 network from the 192.168.11.0/24 network.

```
R2(config)# access-list 1 deny 192.168.11.0 0.0.0.255
```

b. By default, an access list denies all traffic that does not match any rules. To permit all other traffic,

configure the following statement:

```
R2(config)# access-list 1 permit any
```

c. Before applying an access list to an interface to filter traffic, it is a best practice to review the contents of the access list, in order to verify that it will filter traffic as expected.

```
R2# show access-lists
Standard IP access list 1
        10 deny 192.168.11.0 0.0.0.255
        20 permit any
```

d. For the ACL to actually filter traffic, it must be applied to some router operation. Apply the ACL by placing it for outbound traffic on the GigabitEthernet 0/0 interface. Note: In an actual operational network, it is not a good practice to apply an untested access list to an active interface.

```
R2(config)# interface GigabitEthernet0/0
R2(config-if)# ip access-group 1 out
```

Step 2: Configure and apply a numbered standard ACL on R3.

a. Create an ACL using the number **1** on **R3** with a statement that denies access to the 192.168.30.0/24 network from the **PC1** (192.168.10.0/24) network.

```
R3(config)# access-list 1 deny 192.168.10.0 0.0.0.255
```

b. By default, an ACL denies all traffic that does not match any rules. To permit all other traffic, create a second rule for ACL 1.

```
R3(config)# access-list 1 permit any
```

c. Verify that the access list is configured correctly.

```
R3# show access-lists
Standard IP access list 1
        10 deny 192.168.10.0 0.0.0.255
        20 permit any
```

d. Apply the ACL by placing it for outbound traffic on the GigabitEthernet 0/0 interface.

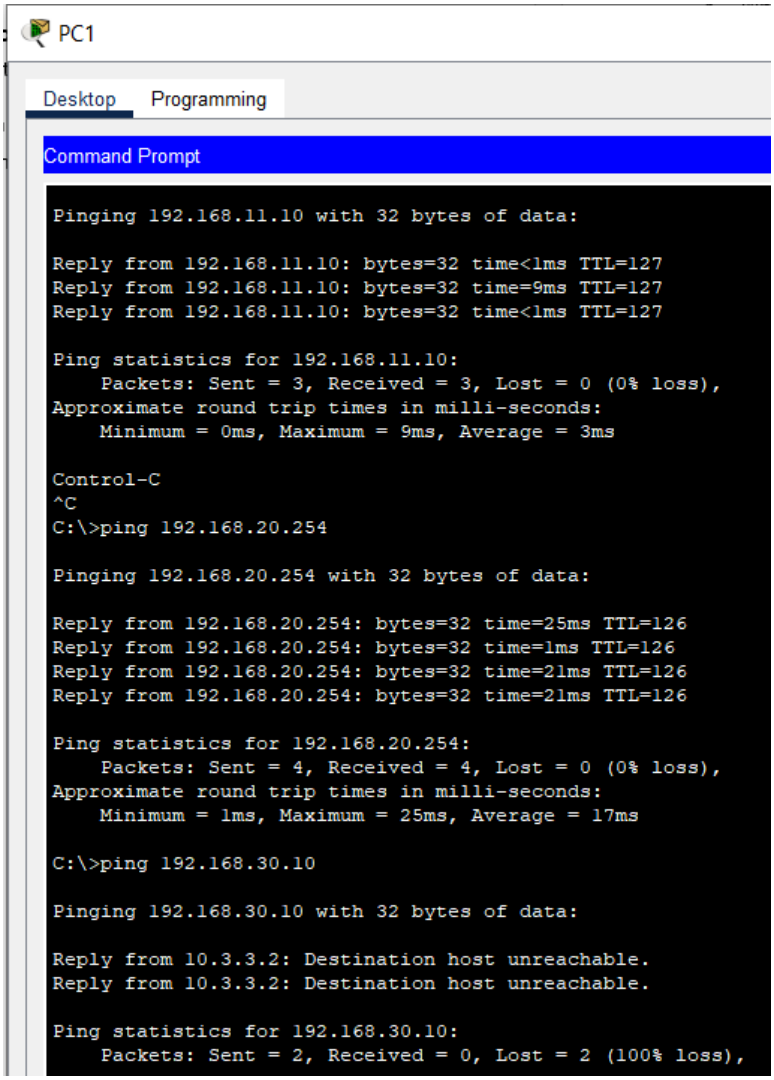
```
R3(config)# interface GigabitEthernet0/0
R3(config-if)# ip access-group 1 out
```

Step 3: Verify ACL configuration and functionality.

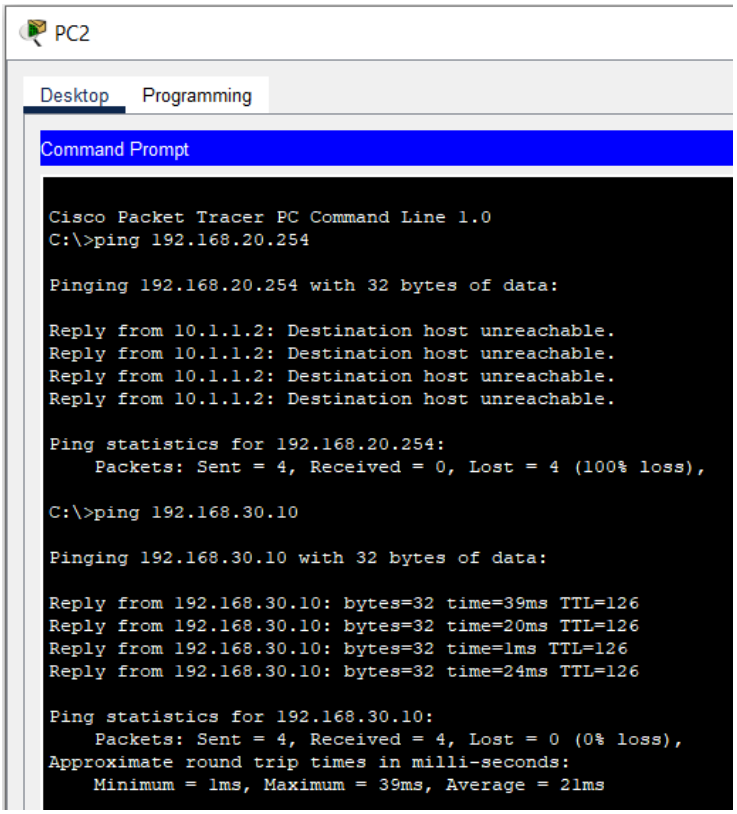
a. Enter the **show run** or **show ip interface gigabitethernet 0/0** command to verify the ACL placements.

b. With the two ACLs in place, network traffic is restricted according to the policies detailed in Part 1. Use the following tests to verify the ACL implementations:

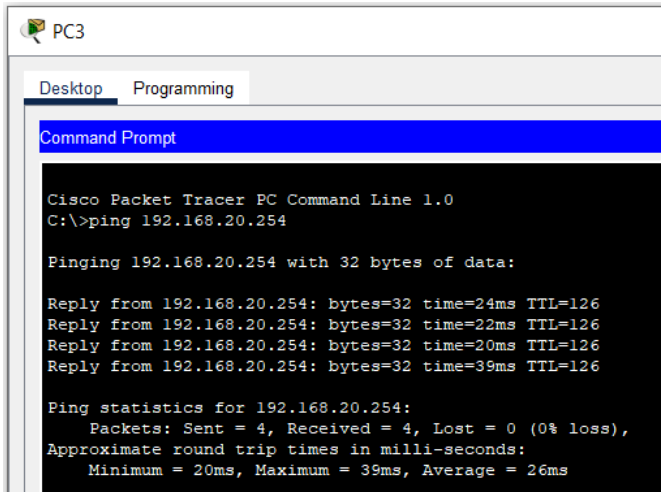
- A ping from 192.168.10.10 to 192.168.11.10 succeeds.
- A ping from 192.168.10.10 to 192.168.20.254 succeeds.
- A ping from 192.168.10.10 to 192.168.30.10 fails.



- A ping from 192.168.11.10 to 192.168.20.254 fails.
- A ping from 192.168.11.10 to 192.168.30.10 succeeds.



- A ping from 192.168.30.10 to 192.168.20.254 succeeds.



c. Issue the **show access-lists** command again on routers **R2** and **R3**. You should see output that indicates the number of packets that have matched each line of the access list. Note: The number of matches shown for your routers may be different, due to the number of pings that are sent and received.

```
R2# show access-lists
Standard IP access list 1
        10 deny 192.168.11.0 0.0.0.255 (4 match(es))
        20 permit any (8 match(es))
```

```
R3# show access-lists
Standard IP access list 1
        10 deny 192.168.10.0 0.0.0.255 (4 match(es))
        20 permit any (8 match(es))
```

Captura de pantalla.