Lab Manual for Computer Communication and Networking

Lab No. 13

Access Control Lists(DACL+SACL)

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COMPUTER COMMUNICATION AND NETWORKS

LAB EXPERIMENT # 13

Access Control List (ACL)

OBJECTIVE: -

- Apply Standard and Extended ACL to permit or deny specific traffic within the network to filter source packets.

EQUIPMENT: -

1. Two PC Switch (Cisco 2950)
2. One Router
3. Ethernet cables
4. Four Computers

THEORY: -

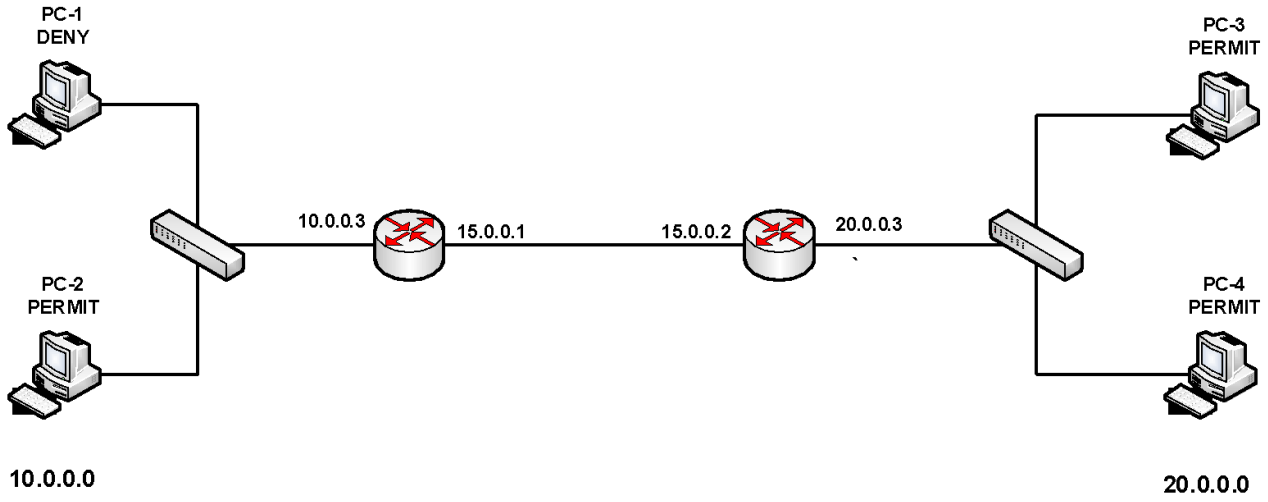
Numbers between 1 and 99, or any number between 1300 and 1999 can be used in a Standard ACL. The number used in this range doesn't affect how the ACL is processed or which ACL is more important to the router. A standard ACL is concerned with only one factor, the source IP address of the packet. The destination is not considered. From Global Configuration mode, type in:

```
access-list [access-list-number] [deny/permit]
[source-ip-address [ wildcard mask]
```

Extended IP lists (100-199) test conditions of source and destination addresses, specific/IP protocols and destination ports. It is recommended that place the Extended ACL near the source.

```
Access-list [list number] [permit | deny] [protocol] [source
address] [source-mask] [destination address]
[destination-mask] [operator] [port]
```

NETWORK TOPOLOGY: -



PROCEDURE AND OBSERVATION: -

Step 1: Assigning IP addresses on the Router R1 and RIP Config

```
R1(config)#interface serial 0
R1(config-if)#ip address 15.0.0.1 255.0.0.0
R1(config-if)#no shutdown
R1(config-if)#clock rate 64000
R1(config-if)#exit
R1(config)#interface ethernet 0
R1(config-if)#ip address 10.0.0.3 255.0.0.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#router rip
R1(config-router)#network 10.0.0.0
R1(config-router)#network 15.0.0.0
```

Step 2: Assigning IP addresses on the Router R2 and RIP Config

```
R2(config)#interface serial 0
R2(config-if)#ip address 15.0.0.2 255.0.0.0
R2(config-if)#no shutdown
R2(config-if)#end
R2(config)#interface ethernet 0
R2(config-if)#ip address 20.0.0.3 255.0.0.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#router rip
R2(config-router)#network 20.0.0.0
R2(config-router)#network 15.0.0.0
```

Step 3: Apply Standard ACL on router 2

Block single host

```
R2(config)#access-list 10 deny host 10.0.0.1
R2(config)#access-list 10 permit any
```

Block single network

```
R2(config)#access-list 10 deny 10.0.0.0 0.255.255.255
R2(config)#access-list 10 permit any
```

Apply the Standard ACL on the Router (R2) Serial Interface

```
R2(config)#interface serial 0
```

```
R2(config-if)#ip access-group 10 in
R2(config-if)#end
```

Step 4: Verifying the Standard ACL from Host '1' by pinging Host '3'

```
C:\>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of Computer:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 20.0.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

When we will access Host D, we will get the same result as above.

Step 5: Now remove all ACL and apply Extended ACL on router 1

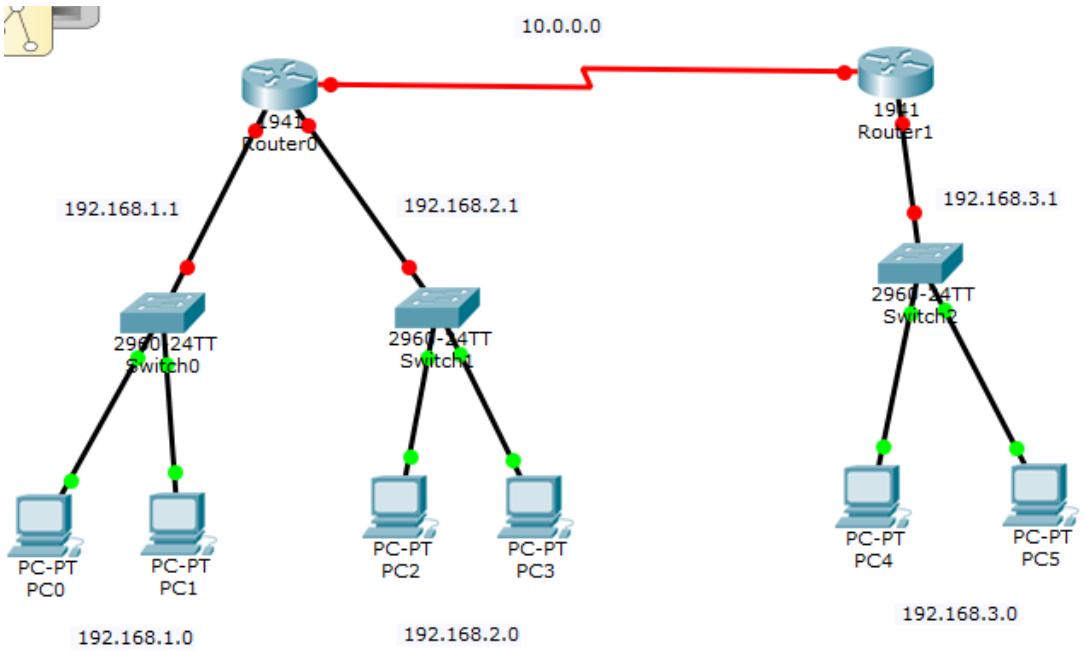
```
R1(config)#access-list 110 deny tcp host 10.0.0.1 host 20.0.0.1 eq
www
R1(config)#access-list 110 deny tcp host 10.0.0.2 host 20.0.0.2 eq
ftp
R1(config)#access-list 110 permit ip any
R1(config-if)#end
R1(config)#interface Ethernet 0
R1(config-if)#ip access-group 110 in
R1(config-if)#end
```

Step 6: Verifying the Standard ACL from Host '1' by pinging Host '3'

```
C:\>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of Computer:
Request timed out.
```

QUESTIONS: -

1. **Apply standard ACL in given network with the following restriction and configuration, show all necessary configuration in your lab task:**
   a. Router 0 and 1 RIP configurations
   b. Create access-list 11
   c. Deny host PC-0 and PC-4
   d. Permit all other network
   e. Verify from PC0 to PC5, from PC4 to PC1



Solution: -

Router 0 Rip Configuration: -

```
Router(config)#router rip
Router(config-router)#network 192.168.1.0
Router(config-router)#network 192.168.2.0
Router(config-router)#network 10.0.0.0
Router(config-router)#exit
```

Router 1 Rip Configuration: -

```
Router(config)#router rip
Router(config-router)#network 192.168.3.0
Router(config-router)#network 10.0.0.0
Router(config-router)#exit
```

Creating access-list and denying pcs: -

```
Router(config)#access-list 11 deny 192.168.1.2
Router(config)#int se0/1/0
Router(config-if)#ip access-group 11 in

Router(config)#access-list 11 deny 192.168.1.2
Router(config)#int se0/1/0
Router(config-if)#ip access-group 11 in
```

Permitting pcs: -

```
Router(config)#access-list 11 permit any
Router(config)#int se0/1/0
Router(config-if)#ip access-group 11 in
```

Pinging from PC0 to PC5: -

```
C:\>ping 192.168.3.3

Pinging 192.168.3.3 with 32 bytes of data:

Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.
Request timed out.

Ping statistics for 192.168.3.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Pinging from PC4 to PC1: -

```
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

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

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

TIME BOXING:

Activity Name	Activity Time	Total Time
Instruments Allocation + Setting up Lab	10 mints	10 mints
Walk through Theory & Tasks (Lecture)	60 mints	60 mints
Implementation & Practice time	90 mints	80 mints
Evaluation Time	20 mints	20 mints
	Total Duration	180 mints

Teacher Signature: _____

Student Registration No: 69966_____