Configurating and Modifying IPV4 ACLs

CIT 167

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Part 1: Set up the Topology and Initialize Devices

i) Cable the Network as show in the topology

I configured the network as seen in the diagram. See Fig. 1 on Pg. 1.

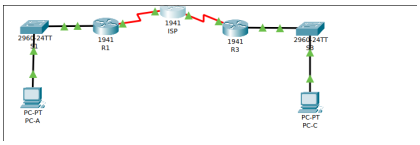


Figure 1: Topology of the Network

ii) Initialize and reload the routers and switches

I initialized the routers for the network, their configurations can be seen in Fig. 2a through Fig. 2c on Pg. 1

```
R1#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     192.168.10.1    YES manual up                    up
Serial0/0/0            10.1.1.1        YES manual down                  down
Serial0/0/1            unassigned      YES unset  administratively down down
Loopback0              192.168.20.1    YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
```

(a) Show ip int of R1

```
ISP#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
Serial0/0/0            10.1.1.2        YES manual up                    up
Serial0/0/1            10.2.2.2        YES manual down                  down
Loopback0              209.165.200.225 YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
```

(b) Show Ip Int of ISP

```
R3#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     192.168.30.1    YES manual up                    up
Serial0/0/0            unassigned      YES unset  administratively down down
Serial0/0/1            10.2.2.1        YES manual up                    up
Loopback0              192.168.40.1    YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
R3#
```

(c) Show Ip int of R3

Figure 2: Configuring the Routers on the network

I initialized the routers for the network, their configurations can be seen in Fig. 3a through Fig. 3d on Pg. 2

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int vlan1
Switch(config-if)#ip addr 192.168.10.11 255.255.255.0
Switch(config-if)#set default
                  ^
% Invalid input detected at '^' marker.

Switch(config-if)#no shut

Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

Switch(config-if)#exit
Switch(config)#ip default-gateway 192.168.10.1
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

(a) Configuring S1

```
Switch>en
Switch#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/1        unassigned      YES manual down                  down
FastEthernet0/2        unassigned      YES manual down                  down
FastEthernet0/3        unassigned      YES manual down                  down
FastEthernet0/4        unassigned      YES manual down                  down
FastEthernet0/5        unassigned      YES manual up                    up
FastEthernet0/6        unassigned      YES manual up                    up
FastEthernet0/7        unassigned      YES manual down                  down
FastEthernet0/8        unassigned      YES manual down                  down
FastEthernet0/9        unassigned      YES manual down                  down
FastEthernet0/10       unassigned      YES manual down                  down
FastEthernet0/11       unassigned      YES manual down                  down
FastEthernet0/12       unassigned      YES manual down                  down
FastEthernet0/13       unassigned      YES manual down                  down
FastEthernet0/14       unassigned      YES manual down                  down
FastEthernet0/15       unassigned      YES manual down                  down
FastEthernet0/16       unassigned      YES manual down                  down
FastEthernet0/17       unassigned      YES manual down                  down
FastEthernet0/18       unassigned      YES manual down                  down
FastEthernet0/19       unassigned      YES manual down                  down
FastEthernet0/20       unassigned      YES manual down                  down
FastEthernet0/21       unassigned      YES manual down                  down
FastEthernet0/22       unassigned      YES manual down                  down
FastEthernet0/23       unassigned      YES manual down                  down
FastEthernet0/24       unassigned      YES manual down                  down
GigabitEthernet0/1     unassigned      YES manual down                  down
GigabitEthernet0/2     unassigned      YES manual down                  down
Vlan1                  192.168.10.11   YES manual up                    up
Switch#
Switch#
```

(b) Show ip int brief of S1

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int vlan1
Switch(config-if)#ip addr 192.168.30.11
% Incomplete command.
Switch(config-if)#ip addr 192.168.30.11 255.255.255.0
Switch(config-if)#no shut

Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

Switch(config-if)#exit
Switch(config)#ip default-gateway 192.168.30.1
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

(c) Configuring S3

```
Switch#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/1        unassigned      YES manual down                  down
FastEthernet0/2        unassigned      YES manual down                  down
FastEthernet0/3        unassigned      YES manual down                  down
FastEthernet0/4        unassigned      YES manual down                  down
FastEthernet0/5        unassigned      YES manual up                    up
FastEthernet0/6        unassigned      YES manual down                  down
FastEthernet0/7        unassigned      YES manual down                  down
FastEthernet0/8        unassigned      YES manual down                  down
FastEthernet0/9        unassigned      YES manual down                  down
FastEthernet0/10       unassigned      YES manual down                  down
FastEthernet0/11       unassigned      YES manual down                  down
FastEthernet0/12       unassigned      YES manual down                  down
FastEthernet0/13       unassigned      YES manual down                  down
FastEthernet0/14       unassigned      YES manual down                  down
FastEthernet0/15       unassigned      YES manual down                  down
FastEthernet0/16       unassigned      YES manual down                  down
FastEthernet0/17       unassigned      YES manual down                  down
FastEthernet0/18       unassigned      YES manual up                    up
FastEthernet0/19       unassigned      YES manual down                  down
FastEthernet0/20       unassigned      YES manual down                  down
FastEthernet0/21       unassigned      YES manual down                  down
FastEthernet0/22       unassigned      YES manual down                  down
FastEthernet0/23       unassigned      YES manual down                  down
FastEthernet0/24       unassigned      YES manual down                  down
GigabitEthernet0/1     unassigned      YES manual down                  down
GigabitEthernet0/2     unassigned      YES manual down                  down
Vlan1                  192.168.30.11   YES manual up                    up
Switch#
Switch#
```

(d) Show ip int brief of S3

Figure 3: Configuring the switches on the network

Part 2: Configure Devices and Verify Connectivity

i) Configure IP addresses on PC-A and PC-C

I configured the PCs for the network. See Fig. 4 on Pg. 3.

(a) IP Configuration of PC-a

(b) IP configuration of PC-C

Figure 4: IP configurations for the PCs of the network

ii) Configure basic settings for the routers

I configured the basic settings, and then copied the running config to the starting config.

```
R1#
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

(a) Copy Show-run R1

```
ISP#
ISP#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

(b) Copy Show-run ISP

```
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

(c) CopyShow-run R3

Figure 5: Basic configurations of the routers

iii) Configure RIP routing on R1, ISP, and R3

I Set the Routers on the network up for RIP V2. See Fig. 6 on Pg. 4. I then Verified the connections on each of the networks, running the commands `show ip protocols` and `show ip route`. See Fig. 7 on Pg. 5.

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 192.168.10.0
R1(config-router)#netowrk 192.168.20.0
                   ^
% Invalid input detected at '^' marker.

R1(config-router)#network 192.168.20.0
R1(config-router)#network 10.1.1.0
R1(config-router)#
```

(a) RipV2 setup on R1

```
ISP#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ISP(config)#router rip
ISP(config-router)#version 2
ISP(config-router)#network 209.165.200.224
ISP(config-router)#network 10.1.1.0
ISP(config-router)#network 10.2.2.0
ISP(config-router)#
```

(b) RipV2 setup on ISP

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router rip
R3(config-router)#network 192.168.30.0
R3(config-router)#network 192.168.40.0
R3(config-router)#network 10.2.2.0
R3(config-router)#
```

(c) RipV2 setup on R3

Figure 6: Configuring Rip V2 on the routers

```
R1#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 26 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface             Send  Recv  Triggered RIP  Key-chain
  GigabitEthernet0/1    2     2
  Loopback0             2     2
  Serial0/0/0           2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
            10.0.0.0
            192.168.10.0
            192.168.20.0
Passive Interface(s):
Routing Information Sources:
            Gateway         Distance      Last Update
            10.1.1.2              120      00:00:02
Distance: (default is 120)
```

(a) show ip protocols on R1

```
R1#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

     10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
C       10.1.1.0/30 is directly connected, Serial0/0/0
L       10.1.1.1/32 is directly connected, Serial0/0/0
R       10.2.2.0/30 [120/1] via 10.1.1.2, 00:00:12, Serial0/0/0
     192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/1
L       192.168.10.1/32 is directly connected, GigabitEthernet0/1
     192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.20.0/24 is directly connected, Loopback0
L       192.168.20.1/32 is directly connected, Loopback0
R    192.168.30.0/24 [120/2] via 10.1.1.2, 00:00:12, Serial0/0/0
R    192.168.40.0/24 [120/2] via 10.1.1.2, 00:00:12, Serial0/0/0
     209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
R       209.165.200.0/24 [120/1] via 10.1.1.2, 00:02:00, Serial0/0/0
R       209.165.200.224/27 [120/1] via 10.1.1.2, 00:00:12, Serial0/0/0

R1#
R1#
```

(b) show ip route on R1

```
ISP#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 8 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface             Send  Recv  Triggered RIP  Key-chain
  Loopback0             2     2
  Serial0/0/0           2     2
  Serial0/0/1           2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
            10.0.0.0
            209.165.200.0
Passive Interface(s):
Routing Information Sources:
            Gateway         Distance      Last Update
            10.1.1.1              120      00:00:20
            10.2.2.1              120      00:00:25
Distance: (default is 120)
ISP#
```

(c) show ip protocols on ISP

```
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

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.1.1.0/30 is directly connected, Serial0/0/0
L       10.1.1.2/32 is directly connected, Serial0/0/0
C       10.2.2.0/30 is directly connected, Serial0/0/1
L       10.2.2.2/32 is directly connected, Serial0/0/1
R    192.168.10.0/24 [120/1] via 10.1.1.1, 00:00:21, Serial0/0/0
R    192.168.20.0/24 [120/1] via 10.1.1.1, 00:00:21, Serial0/0/0
R    192.168.30.0/24 [120/1] via 10.2.2.1, 00:00:28, Serial0/0/1
R    192.168.40.0/24 [120/1] via 10.2.2.1, 00:00:28, Serial0/0/1
     209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.165.200.224/27 is directly connected, Loopback0
L       209.165.200.225/32 is directly connected, Loopback0

ISP#
```

(d) show ip route on ISP

```
R3#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 7 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface             Send  Recv  Triggered RIP  Key-chain
  GigabitEthernet0/1    2     2
  Loopback0             2     2
  Serial0/0/1           2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
            10.0.0.0
            192.168.30.0
            192.168.40.0
Passive Interface(s):
Routing Information Sources:
            Gateway         Distance      Last Update
            10.2.2.2              120      00:00:12
Distance: (default is 120)
R3#
```

(e) show ip protocols on R3

```
R3#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

     10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
R       10.1.1.0/30 [120/1] via 10.2.2.2, 00:00:27, Serial0/0/1
C       10.2.2.0/30 is directly connected, Serial0/0/1
L       10.2.2.1/32 is directly connected, Serial0/0/1
R    192.168.10.0/24 [120/2] via 10.2.2.2, 00:00:27, Serial0/0/1
R    192.168.20.0/24 [120/2] via 10.2.2.2, 00:00:27, Serial0/0/1
     192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.30.0/24 is directly connected, GigabitEthernet0/1
L       192.168.30.1/32 is directly connected, GigabitEthernet0/1
     192.168.40.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.40.0/24 is directly connected, Loopback0
L       192.168.40.1/32 is directly connected, Loopback0
     209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
R       209.165.200.0/24 [120/1] via 10.2.2.2, 00:02:15, Serial0/0/1
R       209.165.200.224/27 [120/1] via 10.2.2.2, 00:00:27, Serial0/0/1
```

(f) show ip route on R3

Figure 7: Verifying RIPv2 on the routers

iv) Verify connectivity between Devices

a.

The pings from PC-A to PC-C and from PC-A to the loopback on R3 were both successful. See Fig. 8a on Pg. 6.

b.

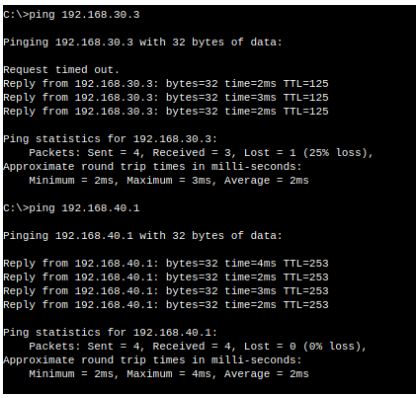
The pings from R1 to PC-C and to the loopback interface on R3 were both successful. See Fig. 8b on Pg. 6.

c.

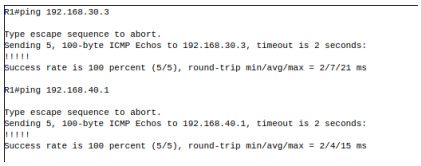
The pings from PC-C to PC-A and the loopback interface of R1 were both successful. See Fig. 8c on Pg. 6.

d.

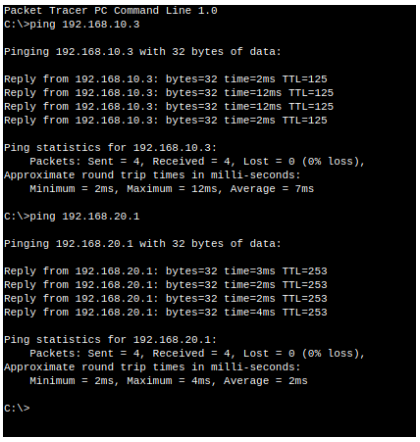
The pings from R3 to PC-A and the loopback interface on R1 were both successful. See Fig. 8d on Pg. 6.



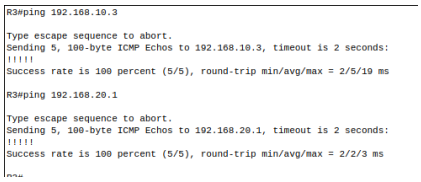
(a) PC-A to PCC and R3 loopback



(b) R1 to PC-C and R3 loopback



(c) PC-C to PC-A and R1 loopback



(d) R3 to PC-A and R1 loopback

Figure 8: Verifying connection on the network

Part 3: Configure and Verify Standard Numbered and Named ACLs

i) Configure a numbered standard ACL
What wildcart mask would you use to allow all hosts on the 192.168.10.0/24 network to access the 192.168.30.0/24 network?
I would use the 0.0.0.255 wildcard to allow any host from the 192.168.10.anything.

Following Cisco's recommended best practices, on which router would you place this ACL?
router 3, becuase is closest to the network we want to restrict access to.

On which interface would you place this ACL? In what direction would you apply it?

I would place it on G0/1. And I would make it OUtbound.
a. And b. I configured it according to the file and then I applied the ACL (Fig. 9a)
c. 1 I verified the ACL was in place with `show access-lists` (Fig. 9b).
2 then ran `show ip int g0/1` (Fig. 9c).
3 PC-A succssesfully pinging PC-C (Fig. 9d). **4** And then successfully pinging PC-C with an extended ping from the loopback address on R1 (Fig. 9e)

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#access-list 1 remark Allow R1 LANs Access
R3(config)#access-list 1 permit 192.168.10.0 0.0.0.255
R3(config)#access-list 1 permit 192.168.20.0 0.0.0.255
R3(config)#access-list 1 deny any
R3(config)#int g0/1
R3(config-if)#ip access-group 1 out
R3(config-if)#
```

(a) Configuring and Applying the ACL to R3

```
R3#show access-lists
Standard IP access list 1
    10 permit 192.168.10.0 0.0.0.255
    20 permit 192.168.20.0 0.0.0.255
    30 deny any
```

(b) Show access-lists on R3

```
GigabitEthernet0/1 is up, line protocol is up (connected)
  Internet address is 192.168.30.1/24
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is 1
  Inbound  access list is not set
  Proxy ARP is enabled
```

(c) Show ip int G0/1 on R3

```
C:\>ping 192.168.30.3

Pinging 192.168.30.3 with 32 bytes of data:

Reply from 192.168.30.3: bytes=32 time=4ms TTL=125
Reply from 192.168.30.3: bytes=32 time=2ms TTL=125
Reply from 192.168.30.3: bytes=32 time=2ms TTL=125
Reply from 192.168.30.3: bytes=32 time=2ms TTL=125

Ping statistics for 192.168.30.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 4ms, Average = 2ms
```

(d) PC-A pinging PC-C

```
R1#ping
Protocol [ip]: 192.168.30.3
% Unknown protocol - "192.168.30.3", type "ping ?" for help

R1#ping
Protocol [ip]:
Target IP address: 192.168.30.3
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 192.168.20.1
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.30.3, timeout is 2 seconds:
Packet sent with a source address of 192.168.20.1
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/6/23 ms

R1#
```

(e) R3 loopback pinging PC-C

Figure 9: Configuring a Named ACL on R3

ii) Configure a named standard ACL

Following Cisco's best practices, on which router would you place this ACL?
I would place it on R1.

On which interface would you place this ACL? In what direction would you apply it?
I would place it on G0/1 as an outbound policy.

a. And b. I configured it according to the file and then I applied the ACL (Fig. 10a)

c. 1 I verified the ACL was in place with `show access-lists` (Fig. 10b).

2 then ran `show ip int g0/1` (Fig. 10c).

3 PC-C succssesfully pinging PC-A (Fig. 10d). **4** And then unsuccessfully pinging PC-A with an extended ping from the G0/1 address on R3 (Fig. 10e) **5** Successfully pinging PC-A with an Extended ping from the loopback address on R3 (Fig. 10f).

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ip access-list standard Branch-Office-Policy
R1(config-std-nacl)#permit host 192.168.30.3
R1(config-std-nacl)#permit 192.168.40.0 0.0.0.255
R1(config-std-nacl)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int g0/1
R1(config-if)#ip access-group Branch-Office-Policy out
R1(config-if)#
```

(a) Configuring and applying the ACL on R1

```
R1#show access-lists
Standard IP access list Branch-Office-Policy
    10 permit host 192.168.30.3
    20 permit 192.168.40.0 0.0.0.255
```

(b) show access-lists on R1

```
R1#show ip int g0/1
GigabitEthernet0/1 is up, line protocol is up (connected)
  Internet address is 192.168.10.1/24
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is Branch-Office-Policy
  Inbound  access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
```

(c) show ip int g0/1 on R1

```
C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time=4ms TTL=125
Reply from 192.168.10.3: bytes=32 time=6ms TTL=125
Reply from 192.168.10.3: bytes=32 time=11ms TTL=125
Reply from 192.168.10.3: bytes=32 time=5ms TTL=125

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 11ms, Average = 6ms
```

(d) PC-C pinging PC-A

```
R3#ping
Protocol [ip]:
Target IP address: 192.168.10.3
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 192.168.30.1
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.3, timeout is 2 seconds:
Packet sent with a source address of 192.168.30.1
UUUUU
Success rate is 0 percent (0/5)
```

(e) Pinging PC-A from G0/1 on R3

```
R3#ping
Protocol [ip]:
Target IP address: 192.168.10.3
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 192.168.40.1
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.3, timeout is 2 seconds:
Packet sent with a source address of 192.168.40.1
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/7/30 ms
```

(f) Pinging PC-A from loopback0 on R3

Figure 10: Configuring and verifying a named ACL on R1

Part 4: Modify a Standard ACL

i) Modify a named standard ACL

a

I ran `show access-lists` on R1 (Fig. 11a).

b

I added two aditional Policies to Branch-Office-Policy (Fig. 11b).

c

I ran show access-lists again to show the newly configured access-list (Fig. 11c).

1

No, I don't have to reapply it because I only updated the policy that had already been placed on G0/1 on R1. Seen from the `show ip int g0/1` output(Fig. 11d).

2

From the ISP router I ran an extended ping from the loopback 0 address, to PC-A's IP address successfully (Fig. 11e).

```
R1#show access-lists
Standard IP access list Branch-Office-Policy
    10 permit host 192.168.30.3 (4 match(es))
    20 permit 192.168.40.0 0.0.0.255 (5 match(es))
```

(a) show access-lists before modifying

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ip access-list standard Branch-Office-Policy
R1(config-std-nacl)#30 permit 209.165.200.224 0.0.0.31
R1(config-std-nacl)#40 deny any
R1(config-std-nacl)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

(b) modifying ACL on R1

```
R1#show access-lists
Standard IP access list Branch-Office-Policy
    10 permit host 192.168.30.3 (4 match(es))
    20 permit 192.168.40.0 0.0.0.255 (5 match(es))
    30 permit 209.165.200.224 0.0.0.31
    40 deny any
```

(c) show access-lists after modification

```
R1#show ip int g0/1
GigabitEthernet0/1 is up, line protocol is up (connected)
  Internet address is 192.168.10.1/24
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is Branch-Office-Policy
  Inbound  access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
```

(d) show ip int g0/1 after modification

```
ISP>en
Password:
ISP#ping
Protocol [ip]:
Target IP address: 192.168.10.3
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 209.165.200.255
% Invalid source
Source address or interface: 200.165.200.225
% Invalid source
Source address or interface: 209.165.200.225
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.3, timeout is 2 seconds:
Packet sent with a source address of 209.165.200.225
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/7/31 ms
```

(e) Pinging PC-A from loopback 0 of ISP

Figure 11: Modifying a named access-list

Reflection

i) As you can see, standard ACLs are very powerful and work quite well. Why would you ever have the need for using extended ACLs?
Extended ACLs give the extra ability to control not just the host coming into the network, but the host it is trying to reach. Also, gives the ability to select based upon ports and protocols.
ii) Typically more typing is required when using a named ACL as opposed to a numbered ACL. Why would you choose named ACLs over numbered?
It would gives a lesser ability to accidentally choose the wrong name to apply, because it has a name instead of a number. It also has the ability to reduce the need for remarks on the name of it.