**Part 1: Set up the SSH protocol**

Enter the following commands in CLI mode of all Routers

Router>enable

Router#configure t

Router(config)#ip domain-name tyit.com

Router(config)#hostname R0

R0(config)#

R0(config)#crypto key generate rsa

R0(config)#line vty 0 4

R0(config-line)#transport input ssh

R0(config-line)#login local

R0(config-line)#exit

R0(config)#username SSHadmin privilege 15 password tyit2023

R0(config)#exit

R0#

**Part2:**

**Step 1: Configure ACL 10 to block all remote access to the routers except from PC-C.** Use the **access-list** command to create a numbered IP ACL on **R1**, **R2**, and **R3**.

R1(config)# **access-list 10 permit host 192.168.3.3**

R2(config)# **access-list 10 permit host 192.168.3.3**

R3(config)# **access-list 10 permit host 192.168.3.3**

**Step 2: Apply ACL 10 to ingress traffic on the VTY lines.** Use the **access-class** command to apply the access list to incoming traffic on the VTY lines.

R1(config)#line vty 0 4

R1(config-line)# **access-class 10 in**

R2(config-line)# **access-class 10 in**

R3(config-line)# **access-class 10 in**

**Step 3: Verify exclusive access from management station PC-C.**

1. a. Establish an SSH session to 192.168.2.1 from **PC-C** (should be successful).

PC> ssh –l SSHadmin 192.168.2.1

1. b. Establish an SSH session to 192.168.2.1 from **PC-A** (should fail).

**part 3:Create a Numbered IP ACL 120 on R1**

Create an IP ACL numbered 120 with the following rules:

o Permit any outside host to access DNS, SMTP, and FTP services on server **PC-A.**

o Deny any outside host access to HTTPS services on **PC-A.**

o Permit **PC-C** to access **R1** via SSH.

**Step 1: Verify that PC-C can access the PC-A via HTTPS using the web browser.**

Be sure to disable HTTP and enable HTTPS on server PC-A.

**Step 2: Configure ACL 120 to specifically permit and deny the specified traffic.** Use the **access-list** command to create a numbered IP ACL.

R1(config)# **access-list 120 permit udp any host 192.168.1.3 eq domain**

R1(config)# **access-list 120 permit tcp any host 192.168.1.3 eq smtp**

R1(config)# **access-list 120 permit tcp any host 192.168.1.3 eq ftp**

R1(config)# **access-list 120 deny tcp any host 192.168.1.3 eq 443**

R1(config)# **access-list 120 permit tcp host 192.168.3.3 host 10.1.1.1 eq 22**

**Step 3: Apply the ACL to interface S0/0/0.** Use the **ip access-group** command to apply the access list to incoming traffic on interface S0/0/0.

R1(config)# **interface s0/0/0**

R1(config-if)# **ip access-group 120 in**

**Step 4: Verify that PC-C cannot access PC-A via HTTPS using the web browser.**

**part4: Modify an Existing ACL on R1**

**Step 1: Verify that PC-A cannot successfully ping the loopback interface on R2.**

**Step 2: Make any necessary changes to ACL 120 to permit and deny the specified traffic.** Use the **access-list** command to create a numbered IP ACL.

R1(config)# **access-list 120 permit icmp any any echo-reply**

R1(config)# **access-list 120 permit icmp any any unreachable**

R1(config)# **access-list 120 deny icmp any any**

R1(config)# **access-list 120 permit ip any any**

**Step 3: Verify that PC-A can successfully ping the loopback interface on R2.**

**Part 5: Create a Numbered IP ACL 110 on R3**

Deny all outbound packets with source address outside the range of internal IP addresses on **R3**.

**Step 1: Configure ACL 110 to permit only traffic from the inside network.** Use the **access-list** command to create a numbered IP ACL.

R3(config)# **access-list 110 permit ip 192.168.3.0 0.0.0.255 any**

**Step 2: Apply the ACL to interface G0/1.** Use the **ip access-group** command to apply the access list to incoming traffic on interface G0/1.

R3(config)# **interface g0/1**

R3(config-if)# **ip access-group 110 in**

**Part 6: Create a Numbered IP ACL 100 on R3**

On **R3**, block all packets containing the source IP address from the following pool of addresses: any RFC 1918 private addresses, 127.0.0.0/8, and any IP multicast address. Since **PC-C** is being used for remote administration, permit SSH traffic from the 10.0.0.0/8 network to return to the host **PC-C**.

**Step 1: Configure ACL 100 to block all specified traffic from the outside network.**

You should also block traffic sourced from your own internal address space if it is not an RFC 1918 address. In this activity, your internal address space is part of the private address space specified in RFC 1918. Use the **access-list** command to create a numbered IP ACL.

**access-list 100 permit tcp 10.0.0.0 0.255.255.255 eq 22 host**

**192.168.3.3**

R3(config)# **access-list 100 deny ip 10.0.0.0 0.255.255.255 any**

R3(config)# **access-list 100 deny ip 172.16.0.0 0.15.255.255 any**

R3(config)# **access-list 100 deny ip 192.168.0.0 0.0.255.255 any**

R3(config)# **access-list 100 deny ip 127.0.0.0 0.255.255.255 any**

R3(config)# **access-list 100 deny ip 224.0.0.0 15.255.255.255 any** R3(config)# **access-list 100 permit ip any any**

**Step 2: Apply the ACL to interface Serial 0/0/1.**

Use the **ip access-group** command to apply the access list to incoming traffic on interface Serial 0/0/1.

R3(config)# **interface s0/0/1**

R3(config-if)# **ip access-group 100 in**

**Step 3: Confirm that the specified traffic entering interface Serial 0/0/1 is handled correctly.**

1. a. From the PC-C command prompt, ping the PC-A server. The ICMP echo replies are blocked by the ACL since they are sourced from the 192.168.0.0/16 address space.
2. b. Establish an SSH session to 192.168.2.1 from **PC-C** (should be successful).