

Name: Miftahul Huq

Course: Network Security

Course Prefix: CSEC 744

Section: 01

Chapter 10: Infrastructure Security

Lab Exercise 10.01: Port Security on Switches

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Step 1b:

Switch0

```
S0(config-if)#switchport mode access
S0(config-if)#switchport port-security
S0(config-if)#switchport port-security mac-address sticky
S0(config-if)#
```

Step 2a:

PC0

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Request timed out.
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time=1ms TTL=125

Ping statistics for 10.4.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Step 2b:

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```
S0#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)          (Count)          (Count)
-----
Fa0/1      1              1              0          Shutdown
-----

S0#show port-security int f0/1
Port Security      : Enabled
Port Status        : Secure-up
Violation Mode      : Shutdown
Aging Time         : 0 mins
Aging Type          : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses : 1
Total MAC Addresses : 1
Configured MAC Addresses : 0
Sticky MAC Addresses  : 1
Last Source Address:Vlan : 00E0.B0AE.557A:1
Security Violation Count : 0
```

```
S0#show running-config
Building configuration...

Current configuration : 1485 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname S0
!
enable secret 5 $1$mERr$2jygS30agKvkxKp5BbQlu.
!
!
!
ip ssh version 2
ip domain-name weissman.edu
!
username jonathan privilege 1 password 0 weissman
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 00E0.B0AE.557A
!
interface FastEthernet0/2
```

```
!
interface Vlan1
 ip address 10.1.0.52 255.255.0.0
!
ip default-gateway 10.1.0.99
!
!
!
!
line con 0
 login local
!
line vty 0 4
 login local
 transport input ssh
line vty 5 15
 login local
 transport input ssh
!
!
!
!
end

S0#
```

Step 2c:

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```
S0#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
S0#reload
Proceed with reload? [confirm]
C2960 Boot Loader (C2960-HBOOT-M) Version 12.2(25r)FX, RELEASE SOFTWARE (fc4)
Cisco WS-C2960-24TT (RC32300) processor (revision C0) with 21039K bytes of memory.
2960-24TT starting...
Base ethernet MAC Address: 0060.476D.AC99
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 2 files, 0 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 64016384
flashfs[0]: Bytes used: 4671940
flashfs[0]: Bytes available: 59344444
flashfs[0]: flashfs fsck took 1 seconds.
...done Initializing Flash.

Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4

Loading "flash:/2960-lanbasek9-mz.150-2.SE4.bin"...
##### [OK]
Smart Init is enabled
smart init is sizing iomem
                TYPE      MEMORY_REQ
            TOTAL:      0x000000000
Rounded IOMEM up to: 0Mb.
Using 6 percent iomem. [0Mb/512Mb]

                Restricted Rights Legend
Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
```

Step 2d:

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```
S0#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
              (Count)      (Count)      (Count)
-----
Fa0/1         1           1           0           Shutdown
-----

S0#show port-security int f0/1
Port Security      : Enabled
Port Status        : Secure-up
Violation Mode      : Shutdown
Aging Time         : 0 mins
Aging Type         : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses : 1
Total MAC Addresses : 1
Configured MAC Addresses : 0
Sticky MAC Addresses : 1
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0
```

```
S0#show running-config
Building configuration...

Current configuration : 1485 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname S0
!
enable secret 5 $l$mERr$2jygS30agKvkxKp5BbQlu.
!
!
!
ip ssh version 2
ip domain-name weissman.edu
!
username jonathan privilege 1 password 0 weissman
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
    switchport mode access
    switchport port-security
    switchport port-security mac-address sticky
    switchport port-security mac-address sticky 00E0.B0AE.557A
!
interface FastEthernet0/2
```

```
!
interface GigabitEthernet0/2
!
interface Vlan1
    ip address 10.1.0.52 255.255.0.0
!
ip default-gateway 10.1.0.99
!
!
!
!
line con 0
    login local
!
line vty 0 4
    login local
    transport input ssh
line vty 5 15
    login local
    transport input ssh
!
!
!
!
end

S0#
```

Step 3a:

PC0

Physical

Config

Desktop

Programming

Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status

☒ On

Bandwidth

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

BAD1.BAD2.BAD3

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

10.1.0.100

Subnet Mask

255.255.0.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local Address

FE80::BAD1:BAFF:FED2:BAD3

Step 3b:

PC0

C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Request timed out.

Request timed out.

Request timed out.

Request timed out.

Ping statistics for 10.4.0.3:

Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>

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Step 3c:

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```
S0#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)          (Count)          (Count)
-----
Fa0/1      1              1              1              Shutdown
-----

S0#show port-security int f0/1
Port Security           : Enabled
Port Status             : Secure-shutdown
Violation Mode          : Shutdown
Aging Time              : 0 mins
Aging Type              : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses   : 1
Total MAC Addresses     : 1
Configured MAC Addresses : 0
Sticky MAC Addresses    : 1
Last Source Address:Vlan : BAD1.BAD2.BAD3:1
Security Violation Count : 1
```

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```
S0#show int f0/1
FastEthernet0/1 is down, line protocol is down (err-disabled)
  Hardware is Lance, address is 00d0.ffe9.5e01 (bia 00d0.ffe9.5e01)
  BW 100000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s
  input flow-control is off, output flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    956 packets input, 193351 bytes, 0 no buffer
    Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 watchdog, 0 multicast, 0 pause input
    0 input packets with dribble condition detected
  2357 packets output, 263570 bytes, 0 underruns
    0 output errors, 0 collisions, 10 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out

S0#
```

Step 4a:

Switch0

```
S0#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S0(config)#int f0/1
S0(config-if)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
S0(config-if)#no shutdown

S0(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
S0(config-if)#
```

Step 4b:

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```
S0#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)          (Count)          (Count)
-----
      Fa0/1             1             1             0      Shutdown
-----

S0#show port-security int f0/1
Port Security           : Enabled
Port Status             : Secure-up
Violation Mode          : Shutdown
Aging Time              : 0 mins
Aging Type              : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses   : 1
Total MAC Addresses     : 1
Configured MAC Addresses : 0
Sticky MAC Addresses    : 1
Last Source Address:Vlan : BAD1.BAD2.BAD3:1
Security Violation Count : 0
```


IOS Command Line Interface

```
S0#show int f0/1
FastEthernet0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 00d0.ffe9.5e01 (bia 00d0.ffe9.5e01)
  BW 100000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s
  input flow-control is off, output flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    956 packets input, 193351 bytes, 0 no buffer
    Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 watchdog, 0 multicast, 0 pause input
    0 input packets with dribble condition detected
    2357 packets output, 263570 bytes, 0 underruns
    0 output errors, 0 collisions, 10 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out

S0#
```

Step 4c:

IOS Command Line Interface

```
!
interface FastEthernet0/1
  switchport mode access
  switchport port-security
  switchport port-security mac-address sticky
  switchport port-security mac-address sticky 00E0.B0AE.557A
!
```

PC0

Physical **Config** Desktop Programming Attributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Bluetooth

FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00E0.B0AE.557A

IP Configuration

☐ DHCP

☒ Static

IPv4 Address 10.1.0.100

Subnet Mask 255.255.0.0

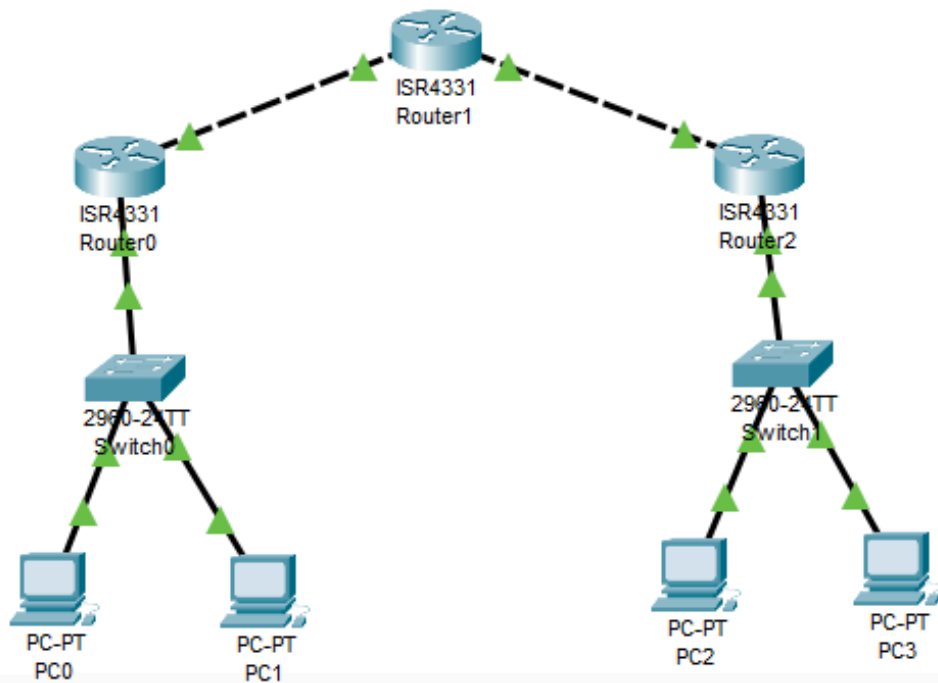
IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local Address: FE80::BAD1:BAFF:FED2:BAD3



PC0

```
C:\>ping 10.4.0.3

Pinging 10.4.0.3 with 32 bytes of data:

Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125
Reply from 10.4.0.3: bytes=32 time<1ms TTL=125

Ping statistics for 10.4.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```