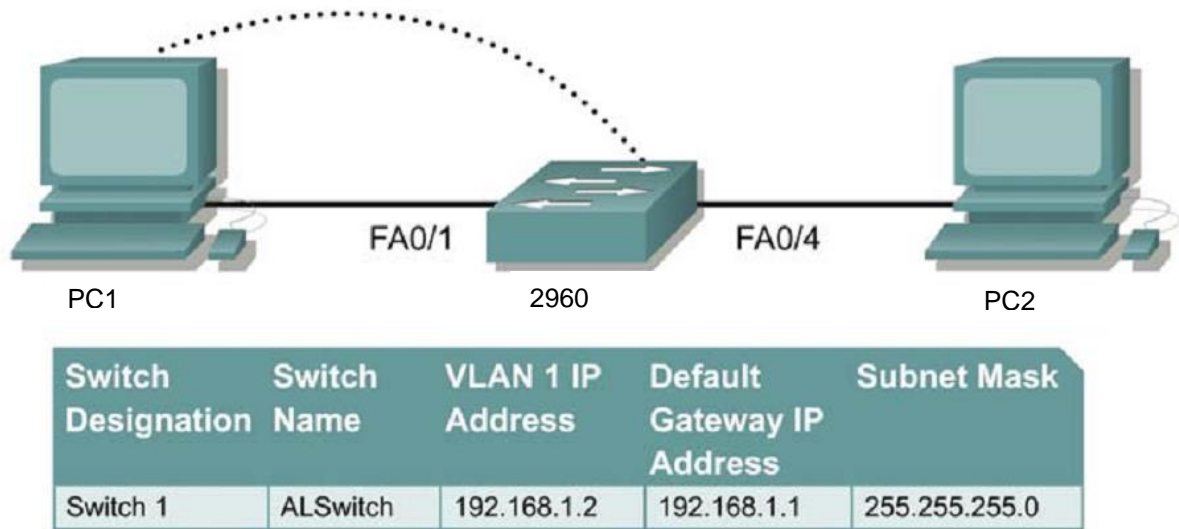






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The **answer sheet URL** is posted on OLE. Please login to your OUHK Google Gmail account (gxxxxxxx@study.ouhk.edu.hk) and submit your answer online. **Due date: Wed, 19 May 2021, 23:59**

Lab 6.2.3 Managing the MAC Address Table



Straight-through cable	
Serial cable	
Console (Rollover)	
Crossover cable	

Objective

- Create a basic switch configuration.
- Manage the switch MAC table.

Background/Preparation

Cable a network similar to the one in the diagram.

Step 1 Configure the switch

Configure the hostname and the management LAN settings. These values are shown in the chart.

Step 2 Configure the hosts attached to the switch

Configure the hosts to use the same IP subnet for the address, mask, and default gateway as on the switch.

Step 3 Verify connectivity

- To verify that hosts and switch are correctly configured, ping the switch IP address from the hosts.
- Were the pings successful? _____
- If the answer is no, troubleshoot the hosts and switch configurations.

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Step 4 Record the MAC address of the host

- Determine and record the layer 2 addresses of the PC network interface cards.

If running Windows, check by using **Start > Run > cmd > ipconfig /all**.

If working on Packet Tracer, click the PC > Desktop tab > Command Prompt > **ipconfig /all**.

- PC1: _____
- PC2: _____

Step 5 Determine the MAC addresses that the switch has learned

- Ping the switch VLAN1 IP address from each host.
- To determine the MAC addresses the switch has learned, use the **show mac-address-table** command as follows at the privileged EXEC mode prompt:

```
ALSwitch#show mac-address-table
```

- How many dynamic addresses are there? _____
- How many total MAC addresses are there? _____
- How many addresses have been user defined (not DYNAMIC)? _____
- Do the MAC addresses match the host MAC addresses on Step 4? _____

Step 6 Determine the show MAC table options

- To determine the MAC addresses the switch has learned, use the **show mac-address-table** command as follows at the privileged EXEC mode prompt:

```
ALSwitch#show mac-address-table ?
```

Step 7 Clear the MAC address table

- To remove the existing MAC addresses use the **clear mac-address-table** command from the privileged EXEC mode prompt as follows:

```
ALSwitch#clear mac-address-table dynamic
```

Step 8 Verify the results

- Verify that the mac-address-table was cleared as follows:

```
ALSwitch#show mac-address-table
```

- How many total MAC addresses are there now? _____
- How many dynamic addresses are there? _____

Step 9 Determine the clear MAC table options

- To determine the options available use the command **clear mac-address-table ?** at the privileged EXEC mode prompt as follows:

```
ALSwitch#clear mac-address-table ?
```

- How many options are there? _____
- In what circumstances would these options be used? _____

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Step 10

- a. Look at the MAC address table again using the `show mac-address-table` command at the privileged EXEC mode prompt as follows:

```
ALSwitch#show mac-address-table
```

- b. How many dynamic addresses are there? _____
- c. The table has not changed yet. Ping the switch VLAN1 IP address from the hosts and repeat Step 10 (a).
- d. Why did this change from the last display? _____

Step 11 Exit the switch

- a. Type `exit`, as follows to leave the switch welcome screen.

```
Switch#exit
```

- b. Once the steps are completed, logoff by typing exit, and turn all the devices off. Then remove and store the cables and adapter.

Step 12 Check Point: Send your screen capture to the instructor by email before the due date.

- a. Take **one** screen capture with the following items. (Sample capture is on next page).
 - I. CLI of the routers showing the prompt and the output on **Step 10 (a) and (c)**.
 - II. ~~The Computer name and Domain.~~
 - III. The date and time of your capture.
- b. Save the screen capture to a Word file with filename "your_8_digit_student_number-topic11.docx". (Eg. **12345678-topic11.docx**).
- c. Email your saved file to **thluk@ouhk.edu.hk** (subject: **topic 11**).

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PC0

Physical Config **Desktop** Programming Attributes

Terminal

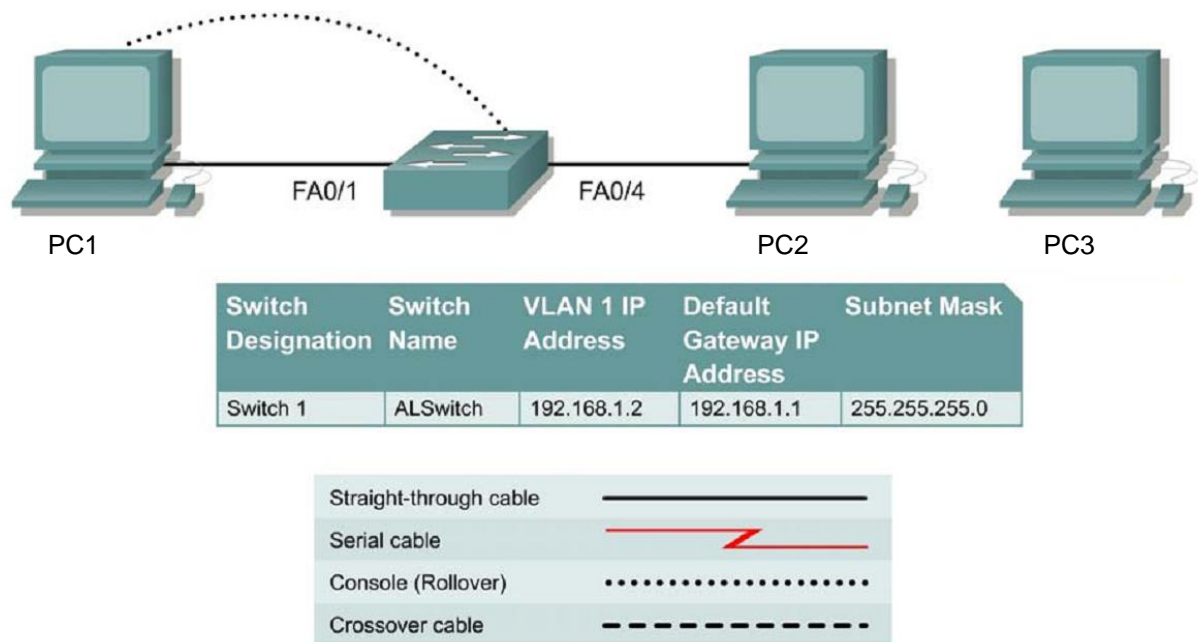
```
ALSwitch#sh mac-  
ALSwitch#sh mac-address-table  
Mac Address Table  
-----  
Vlan    Mac Address      Type      Ports  
-----  
1       0010.1159.648b   DYNAMIC   Fa0/1  
1       00e0.b078.035d   DYNAMIC   Fa0/2  
ALSwitch#sh mac-address-table ?  
dynamic      dynamic entry type  
interfaces   interface entry type  
static       static entry type  
<cr>  
ALSwitch#sh mac-address-table  
Mac Address Table  
-----  
Vlan    Mac Address      Type      Ports  
-----  
1       0010.1159.648b   DYNAMIC   Fa0/1  
1       00e0.b078.035d   DYNAMIC   Fa0/2  
ALSwitch#sh mac-address-table d  
Mac Address Table  
-----  
Vlan    Mac Address      Type      Ports  
-----  
1       0010.1159.648b   DYNAMIC   Fa0/1  
1       00e0.b078.035d   DYNAMIC   Fa0/2  
ALSwitch#clear mac-  
ALSwitch#clear mac-address-table dy  
ALSwitch#clear mac-address-table dynamic  
ALSwitch#sh mac-address-table  
Mac Address Table  
-----  
Vlan    Mac Address      Type      Ports  
-----  
ALSwitch#clear mac-  
ALSwitch#clear mac-address-table ?  
dynamic      dynamic entry type  
<cr>  
ALSwitch#sh mac-address-table  
Mac Address Table  
-----  
Vlan    Mac Address      Type      Ports  
-----  
1       0010.1159.648b   DYNAMIC   Fa0/1  
ALSwitch#
```

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Lab 6.2.5 Configuring Port Security



Objective

- Create and verify a basic switch configuration
- Configure port security on individual FastEthernet ports.

Background/Preparation

Cable a network similar to the one in the diagram. Use 2950 for the switch.

Step 1 Configure the switch

Configure the hostname and the management LAN settings. These values are shown in the chart.

Step 2 Configure the hosts attached to the switch

- Configure the hosts to use the same IP subnet for the address, mask, and default gateway as on the switch.
- There is a third host (PC3) needed for this lab. It needs to be configured with the address 192.168.1.7. The subnet mask is 255.255.255.0 and the default gateway is 192.168.1.1.

Note: Do not connect this PC to the switch yet.

Step 3 Verify connectivity

- To verify that hosts and switch are correctly configured, ping the switch IP address from the hosts.
- Were the pings successful? _____
- If the answer is no, troubleshoot the hosts and switch configurations.

Step 4 Record the host MAC addresses

- Determine and record the layer 2 addresses of the PC network interface cards.
If running Windows, check by using **Start > Run > cmd > ipconfig /all**.
If working on Packet Tracer, click the PC > Desktop tab > Command Prompt > **ipconfig /all**.
- PC1: _____
- PC2: _____

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Step 5 Determine what MAC addresses that the switch has learned

- Ping the switch VLAN1 IP address from each host.
- To determine the MAC addresses the switch has learned, use the `show mac-address-table` command as follows at the privileged EXEC mode prompt:

```
ALSwitch#show mac-address-table
```

- How many dynamic addresses are there? _____
- How many total MAC addresses are there? _____
- Do the MAC addresses match the host MAC addresses? _____

Step 6 List port security options

- Determine the options for setting port security on interface FastEthernet 0/4.

```
ALSwitch(config)#interface fastethernet 0/4
ALSwitch(config-if)#switchport port-security ?
aging          Port-security aging commands
mac-address    Secure mac address
maximum        Max secure addrs
violation      Security Violation Mode
<cr>
```

- To allow the switchport FastEthernet 0/4 to accept only one device, enter port security as follows:

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

Step 7 Verify the results

- Ping the switch VLAN1 IP address from each host.
- Enter the following to verify the mac-address table entries:

```
ALSwitch#show mac-address-table
```

- How are the address types listed for the two MAC addresses? _____
- Show port security settings.

```
ALSwitch#show port-security
```

Step 8 Show the running configuration file

- Are there statements that directly reflect the security implementation in the listing of the running configuration? _____
- What do those statements mean?

Step 9 Limit the number of hosts per port

- On interface FastEthernet 0/4 set the port security maximum MAC count to 1 as follows:

```
ALSwitch(config-if)#switchport port-security maximum 1
```

- Disconnect PC2 attached to FastEthernet 0/4. Connect this port to PC3 (IP address 192.168.1.7).

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- c. Record any observations. _____

Step 10 Configure the port to shut down if there is a security violation

- a. It has been decided that in the event of a security violation the interface should be shut down. Enter the following to make the port security action to shutdown:

```
ALSwitch(config-if)#switchport port-security violation shutdown
```

- b. What other action options are available with **port-security violation**?

- c. Ping the switch VLAN1 IP address 192.168.1.2 from the PC3 (192.168.1.7). This PC is now attached to the interface FastEthernet 0/4 yet. This ensures that there is traffic from the PC to the switch.

- d. Record any observations.

Step 11 Show port 0/4 configuration information

- a. To see the configuration information for just FastEthernet port 0/4, type show interface fastethernet 0/4, as follows, at the Privileged EXEC mode prompt:

```
ALSwitch#show interface fastethernet 0/4
```

- b. What is the state of this interface?

FastEthernet0/4 is (i) _____, line protocol is (ii) _____

Step 12 Reactivate the port

- a. If a security violation occurs and the port is shut down, use **shutdown** and **no shutdown** under the interface configuration to reactivate it.
- b. Try reactivating this port a few times by switching between the original port 0/4 host and the new one. Plug in the original host, type the no shutdown command on the interface and ping using the Command Prompt window. The **ping** will have to be repeated multiple times or use the **ping 192.168.1.2 -n 200** command. This will set the number of ping packets to 200 instead of 4.

Then switch hosts and try again.