**CSC 335 Data Communications and Networking**

**Practice Your Knowledge on VLAN**

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**1. Description**

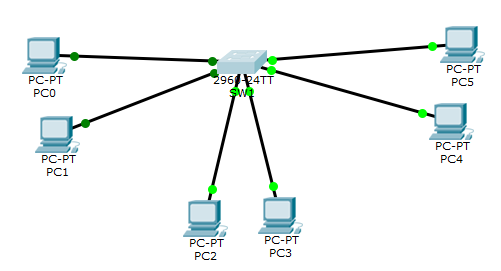
Switching has become the standard for most company internal network infrastructure as each port maintains its own collision domain, and with the advent of VLANs further allow the engineer to segment the network into multiple, smaller broadcast domains. As a Cisco engineer, as well as in the Cisco CCNA exam, you will need to know how to configure VLANs on Cisco switches as well as verify the option.

**Please answer all questions in red and attach required screenshots to this lab report and then submit it to D2L.**

**2. Lab Procedures**

**2.1 Topology**

Step 1: Creating the topology as following figure, where six PCs connected to the same switch



* PC0 interface FastEthernet 0 connect to swtich interface Fa0/1,
* PC1 interface FastEthernet 0 connect to swtich interface Fa0/2
* PC2 interface FastEthernet 0 connect to swtich interface Fa0/3
* PC3 interface FastEthernet 0 connect to swtich interface Fa0/4
* PC4 interface FastEthernet 0 connect to swtich interface Fa0/5,
* PC5 interface FastEthernet 0 connect to swtich interface Fa0/6

**2.2 General Settings**

Step 2: Configure the hostname and display name on Switch0 to be SW1.

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**Show your topology with screenshot.**

**Diagram

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Step 3: Configure no ip domain-lookup on SW1

Under the configure terminal mode, enter “no ip domain-lookup” command

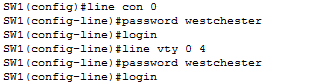
**What is the purpose for no ip domain-lookup command on switch?**

**This command tells the router/switch no to lookup any incorrectly typed commands.**

Step 4: Configure the enable secret password as cisco on SW1

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Step 5: Configure the console and vty password as westchester on SW1



**What is the meaning for line vty 0 4?**

**The meaning of line vty 0 4 is to enter the interface for the range of 5 total virtual terminal lines (0-4)**

Step 6: Configure the exec-timeout command to the console and virtual terminal lines

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**What is the purpose for command exec-timeout 0 0?**

**This command makes sure the console port will never timeout.**

**2.3 Creating VLANs and assign add interfaces to each VLAN**

Step 7: Create the VLANs as shown in figure 1

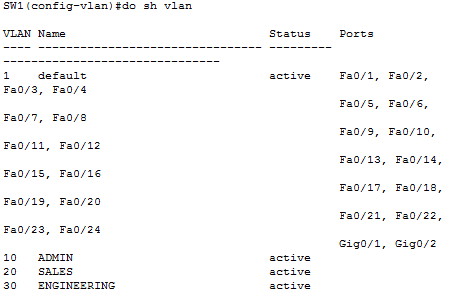
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Configure vlan 20 (name SALES) and vlan 30 (name ENGINEERING) by using similar command.

**What is VLAN? Why we need VLAN?**

**A VLAN is a virtual local area network that subdivides groups of devices on a physical LAN into smaller LANS. This allows for more efficient use of bandwidth (broadcasting data to the individual VLAN rather than the whole network), and enhanced security. For example, at a company that has a law and engineering department, it allows different privileges to be set to access certain company data.**

Step 8: verity vlan configuration by “do sh vlan” command

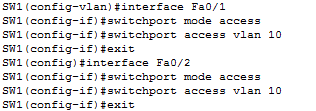


Step 9: Now, add interfaces to each of these VLANs with the switchport command as follows:

* interface Fa0/1, Fa0/2 belongs to VLAN 10, ADMIN
* interface Fa0/3, Fa0/4 belongs to VLAN 20, SALES
* interface Fa0/5, Fa0/6 belongs to VLAN 30, ENGINEERING

There are two ways to add interfaces: (1) add individual interfaces one by one, (2) add a range of interfaces. Let us start from the first method.

Step 9.1 add Fa0/1 and Fa0/2 to VLAN 10 individually



Step 9.2 add ports Fa0/3 – Fa0/4 to VLAN 20 as a group

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Configure interface fa0/5 and interface fa0/6 by using similar command.

Step 10: Verify your VLAN configuration using relevant show commands in Cisco IOS.

Show vlan configuration by using command “do sh vlan” under enable mode.

**Show your VLAN configuration screenshot.**

**Graphical user interface, application

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**2.4 Verify VLANs**

Step 11: assign IP address to hosts

You can click the PC, then select Desktop tab, choose IP configuration and enter the IP address

* PC0: 192.168.1.100 255.255.255.0
* PC1: 192.168.1.101 255.255.255.0
* PC2: 192.168.2.100 255.255.255.0
* PC3: 192.168.2.101 255.255.255.0
* PC4: 192.168.3.100 255.255.255.0
* PC5: 192.168.3.101 255.255.255.0

Step 12: ping within VLAN

For example, you can click PC0, select Desktop tab, choose command prompt, then ping PC1 by typing command “ping 192.168.1.101” (PC0 and PC1 are in the same VLAN). You can also ping PC3 from PC2 (vice versa), and ping PC5 from PC4 (vice versa) by using proper IP address.

**Can you successfully ping devices in the same VLAN? Show the screenshot from ping, and explain WHY.**

**Text

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Devices in the same VLAN can be pinged, the interfaces have the correct IP addresses so the default gateway works.**

Step 13: ping devices in other VLAN

For example, you can click PC0, select Desktop tab, choose command prompt, then ping PC2, PC3, PC4, or PC5, such as “ping 192.168.1.105”

**Can you successfully ping devices in other VLANs? Show the screenshot from ping, and explain WHY.**

**No, the VLANs cannot ping because layer 2 switches are not capable of handling IP addresses. In order to ping between VLANs, a layer 3 switch will be required.**

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**2.5 OPTIONAL: Configure Inter VLAN Routing (2 points towards final grade)**

**Configure inter VLAN routing through Layer 3 switch. Show all the configuration steps as I did previously. Eventually, show that PC0 can successfully ping PC5.**