**Assignment Submission**

**Heading: Challenge 01**

**Approach:** The main objective is to find the username and password to access the switch CLI. The hint provided indicates that the configuration needs to be saved using the copy command to prevent loss of configuration. The methods employed would include accessing the switch CLI, using show commands to view the running-config, and identifying any lines related to username and password configuration

**Solution:** net:game

**Heading: Challenge 02**

**Approach:** The objective of the lab is to experience the MAC learning process and switch forwarding logic on a Cisco Catalyst 2960 switch. The hint provided suggests that changes made on the switch should be verified by checking the configuration.

Use a terminal or console connection to access the command-line interface (CLI) of the Cisco Catalyst 2960 switch.

Once in the CLI, make changes to the switch configuration to observe the MAC learning process and switch forwarding logic. This could involve tasks such as:

* Configuring VLANs and assigning interfaces to VLANs.

After making configuration changes, observe the behaviour of the switch to see how it responds to the changes. This may involve tasks such as:

* Monitoring MAC address tables to see how MAC addresses are learned and aged out.

**Solution:** Secrect key: hackerman and failure

**Heading: Challenge 03**

**Approach:** The objective of the lab is to check whether all VLANs are configured correctly on a switch. The hint provided suggests that troubleshooting individual VLAN configurations may be more effective than reviewing the configuration of all VLANs at once.

**Solution:** The methods employed would include accessing the switch CLI, using show commands (e.g., **show vlan**, **show vlan id <vlan\_id>**) to view VLAN configurations, and comparing the configurations against the desired state. Preprocessing techniques may involve planning the sequence of commands to efficiently troubleshoot each VLAN and identify any misconfigurations

**Heading: Challenge 04**

**Approach:** The objective of the lab is to configure a hostname on the switch. The hint provided indicates that the SSH server uses the fully qualified domain name (FQDN) of the switch, which is created from the hostname and domain name. And to configure the hostname. The methods employed would include accessing the switch CLI, using the **hostname** command to set the hostname, and verifying the configuration using show commands

**Solution:**

* Access the Switch CLI
* Enter Privileged EXEC Mode: enable
* Access Global Configuration Mode: configure terminal
* Set the Hostname: hostname **ssh**

**Heading: Challenge 05**

**Approach:** The mission is to troubleshoot the interface on a Cisco switch and determine the issue affecting its operation. We know that Cisco switches use two different sets of status codes: one set for line status (Layer 1) and protocol status (Layer 2), and another set for single status code indicating the overall interface status (either connected or not connected).

**Solution:**

1. **Access the Switch CLI**: Establish a console or SSH connection to the Cisco switch to access its command-line interface (CLI).
2. **Check Interface Status**: Use the **show interfaces** command to display the status of the interface. Look for both line status and protocol status to determine the issue.
3. **Troubleshoot Based on Status Codes**:

If both line status and protocol status are "up/up," the interface is operational at both Layer 1 and Layer 2. Proceed to test connectivity and ensure correct VLAN assignments, etc.

If the line status is "down," check physical connections, cables, and interface configurations.

If the protocol status is "down," review VLAN configurations, trunking settings, speed/duplex mismatches, or other Layer 2 configuration issues.

**Heading: Challenge 06**

**Approach:** The mission is to verify and correct the IP address configurations on a layer 2 switch. The hint suggests that the IP addresses should be assigned according to VLANs.

**Solution:**

* Establish a connection to the switch's command-line interface (CLI)
* Use the **show vlan** command to view the configured VLANs and their associated interfaces.
* Use the **show interface vlan <vlan\_id>** command to view the IP address configurations for each VLAN interface. Verify that each VLAN has the correct IP address assigned to it.
* Correct IP Address Configurations
* Test connectivity to and from the switch using tools like ping or telnet to ensure that the IP address configurations are functioning as expected.

**Heading: Challenge 07**

**Approach:** Recognize that the most common problem on working interfaces is duplex mismatch. Unlike speed mismatches, duplex mismatches can be challenging to detect because the interface status remains connected (up/up) even when there's a mismatch.

**Solution:**

* **Accessing Switch CLI:** Establish a connection to the switch's command-line interface (CLI)
* **Reviewing Interface Status:** Use the show interfaces status command to check the status of all interfaces on the switch. Pay close attention to the duplex column to identify any interfaces with mismatched duplex settings.
* **Correcting Duplex Mismatches:** If duplex mismatches are found, ensure that both ends of the connection are configured with the same duplex settings. This may involve manually configuring the interfaces or enabling auto-negotiation if supported.
* **Testing Network Connectivity:** After addressing any identified duplex mismatch issues, test the network to ensure that connectivity and performance have improved. Use tools like ping or traceroute to verify connectivity between devices and monitor network performance.

**Heading: Challenge 08**

**Approach:** Recognize that SSH is not functioning correctly in the network. Given the hint, consider whether the hostname and domain configurations are in place, as these are prerequisites for SSH operation.

**Solution:**

* **Access Network Devices**: Use a terminal emulator like PuTTY to access the command-line interface (CLI)
* **Verify Hostname and Domain Configuration**: Check if the hostname and domain configurations are correctly set on the devices. Use commands like **show running-config** or **show hostname** to verify the configurations. If these configurations are missing or incorrect, update them accordingly.
* **Check SSH Configuration**: Review the SSH configuration on the devices. Use commands like **show running-config | include ssh** or **show ssh** to check the SSH settings. Ensure that SSH is enabled and configured correctly, including specifying the version, authentication methods, and allowed users.
* **Generate SSH Keys**: If SSH keys are missing or expired, generate new SSH key pairs using the appropriate commands. This typically involves using the **crypto key generate rsa** or **crypto key generate dsa** command.
* **Check Access Control Lists (ACLs)**: Verify if any access control lists (ACLs) are blocking SSH traffic. Use the **show access-list** command to examine the configured ACLs and ensure that SSH traffic is permitted.
* **Test SSH Connectivity**: Attempt to establish an SSH connection to the network devices from a client machine using SSH client software. Check for any error messages or issues encountered during the connection attempt.

**Heading: Challenge 09**

**Approach:** The mission is to change the timeout configuration on both switches using the "exec-timeout" command. This command sets the time of the inactivity timer, after which a session will be closed if there is no user input.

**Solution:**

* **Accessing Switch CLI**: Log in to the command-line interface (CLI)
* **Enter Privileged EXEC Mode**: After logging in, enter privileged EXEC mode by typing: enable
* **Enter Global Configuration Mode**: Once in privileged EXEC mode, enter global configuration mode by typing: conf t
* **Changing the Timeout Configuration**: Use the **line** command to access the line configuration mode for the console line (line console 0) or the virtual terminal (VTY) lines (line vty 0 15). Then, use the **exec-timeout** command to set the timeout value. For example:
  + line con 0
  + exec-timeout 10 0
* **Verify the Configuration**: After making the changes, use the **show running-config** command to verify that the timeout configuration has been updated correctly.

**Heading: Challenge 10**

**Approach:** The mission is to verify that VLANs are functioning correctly in the network. VLAN trunking is enabled between switches using the 802.1Q protocol, and interfaces need to be configured appropriately to allow trunking.

**Solution:**

* **Accessing Switch CLI:** Log in to the command-line interface (CLI)
* **Checking VLAN Configuration**: Use the **show vlan** command to display the VLAN configuration on each switch. Verify that the VLANs are configured correctly and that all required VLANs are present.
* **Verifying Trunk Interfaces**: Use the **show interface trunk** command to display the trunking status of each interface. Ensure that the interfaces connecting the switches are configured as trunk interfaces and that VLAN trunking is enabled.
* **Configuring Trunk Interfaces**: If necessary, configure the interfaces between switches as trunk interfaces using the **switchport mode trunk** command in interface configuration mode.
* **Checking Interface Status**: Use the **show interface status** command to display the status of all interfaces. Verify that all interfaces are in the desired state (up or down) and that there are no errors or issues.
* **Troubleshooting Dynamic Auto Configuration**: If interfaces are configured as dynamic auto, consider changing them to a specific mode (e.g., dynamic desirable or trunk) to ensure consistent trunking behavior. Use the **switchport mode** command to set the desired mode on each interface.
* **Testing VLAN Functionality**: Once the configurations are verified and any necessary changes are made, test VLAN functionality by sending traffic between devices in different VLANs. Verify that VLAN tagging is applied correctly and that devices can communicate within their respective VLANs.