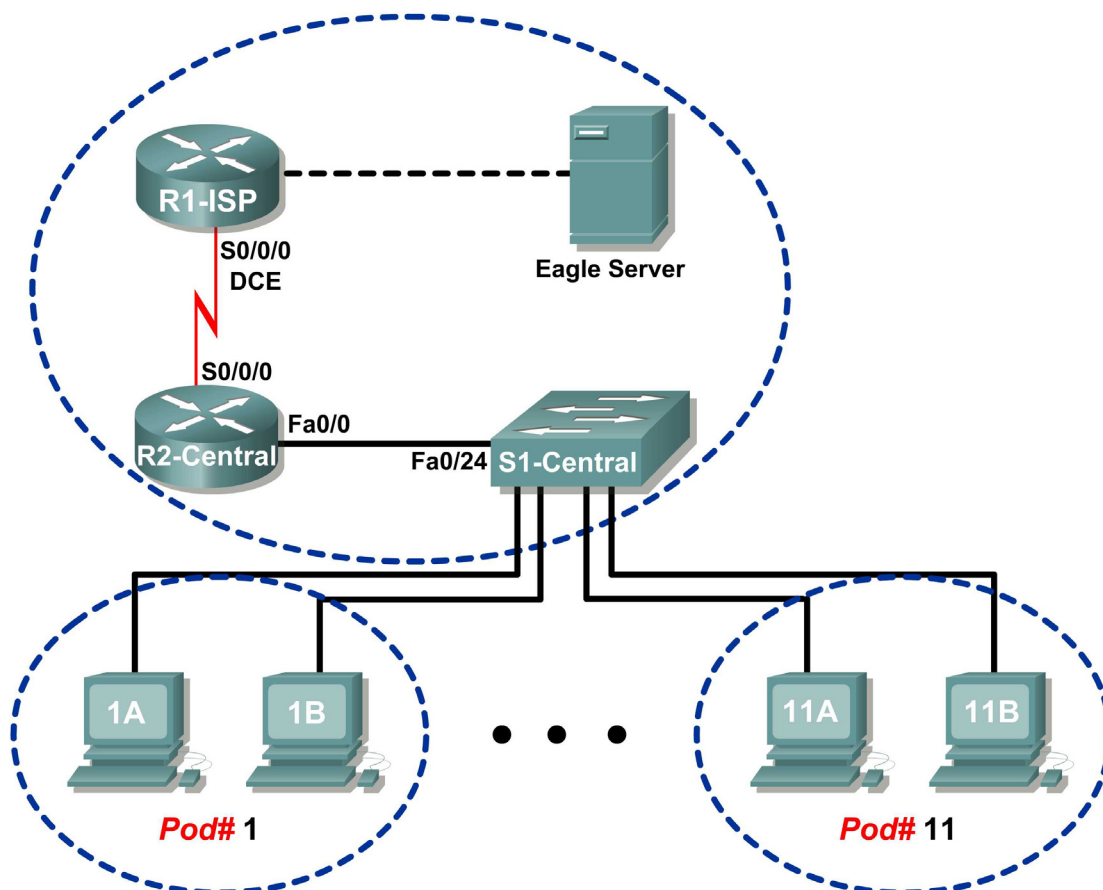# Lab 9.8.2: Cisco Switch MAC Table Examination

Topology Diagram

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1-ISP	S0/0/0	10.10.10.6	255.255.255.252	N/A
	Fa0/0	192.168.254.253	255.255.255.0	N/A
R2-Central	S0/0/0	10.10.10.5	255.255.255.252	N/A
	Fa0/0	172.16.255.254	255.255.0.0	N/A
Eagle Server	N/A	192.168.254.254	255.255.255.0	192.168.254.253
	N/A	172.31.24.254	255.255.255.0	N/A
host*Pod#*A	N/A	172.16.*Pod#*.1	255.255.0.0	172.16.255.254
host*Pod#*B	N/A	172.16.*Pod#*.2	255.255.0.0	172.16.255.254
S1-Central	N/A	172.16.254.1	255.255.0.0	172.16.255.254

Learning Objectives

Upon completion of this lab, you will be able to:

- Use the Telnet protocol to log into a Cisco Switch.
- Use the Cisco IOS **show mac-address-table** command to examine MAC address and port associations.

Background

Switches maintain a table of MAC addresses and associated switch port. When a switch receives a frame, the destination MAC address is checked against the table, and the corresponding port is used to route the frame out of the switch. If a switch does not know which port to route the frame, or the frame is a broadcast, then the frame is routed out all ports except the port where it originated.

Access to Cisco devices can be accomplished through several means. A console port can be used if the Cisco router or switch is within the same physical proximity of a computer. Using Windows hyperterm utility, a serial connection can be established. For devices physically distant from the network engineer, network connectivity can be established through two means. If the network is not secure, a modem configured on the AUX port enables telephone access. For secure networks, the Cisco device can be configured for a Telnet session. In this lab, the student will connect to the switch via a Telnet session.

Lab

- Telnet to S1-Central.
- Log in with student account.
- Use **show mac-address-table** command to examine the mac addresses and association to ports.

Scenario

Use the Cisco IOS **show mac-address-table** command to examine the switch MAC address table and other address-related information.

Telnet is a network service that uses a client-server model. Cisco IOS devices provide a default Telnet server, and operating systems such as Windows have built-in Telnet clients. Using Telnet, network engineers can log into network devices from anywhere across a secure network. The Cisco device must be configured for Telnet access, otherwise it is denied. In Eagle 1, limited privileges have been configured for student use.

Task 1: Use the Telnet Protocol to Log in to a Cisco Switch.

Step 1: Access the Windows terminal.

Open a Windows terminal by clicking **Start > Run**. Type **cmd**, and click **OK**.

Step 2: Use the Windows Telnet client to access S1-Central.

S1-Central has been configured with 11 student accounts, ccna1 through ccna11. To provide access to each student, use the userid corresponding to your pod. For example, for host computers on pod 1, use userid ccna1. Unless directed otherwise by your instructor, the password is cisco.

1. From the Windows terminal, issue the Telnet command, **telnet** *destination-ip-address*:

        C:/> **telnet 172.16.254.1**

    An access prompt will be displayed, similar to the one shown in Figure 1.

```
     ***************************************************************
                   This is Lab switch S1-Central.
                   Authorized access only.
     ***************************************************************
User Access Verification
Username: ccna1
Password: cisco  (*hidden*)
S1-Central#
```

Figure 1. Telnet Client

2. Enter the applicable user name. When the password prompt appears, type `cisco <ENTER>`.

    The `S1-Central#` prompt should appear.

Task 2: Use the Cisco IOS `show mac-address-table` Command to Examine MAC Addresses and Port Associations.

Step 1: Examine the switch MAC address table.

1. Issue the command `show mac-address-table ? <ENTER>`. This will output all options for the command.

2. Use the following table to fill in the command options:

Option	Description

Step 2: Examine dynamic MAC address table entries.

1. Issue the command `show mac-address-table`.
    This command will display static (CPU) and dynamic, or learned, entries.

2. List the MAC addresses and corresponding switch ports:

MAC Address	Switch Port

Suppose there was a hub with five active hosts connected to switch port `gi0/0`. How many MAC addresses would be listed for switch port `gi0/0`? _____

Step 3: Examine MAC address table aging time.

1. Issue the command **show mac-address-table aging-time**.
    This command will display the default time, in seconds, that MAC address entries are stored.

2. What is the default aging time for VLAN 1? _____

Task 3: Challenge

What would be the result if the MAC address table was flushed of dynamic entries?

_____

_____

Task 4: Reflection

Using the Telnet protocol, network engineers can access Cisco devices remotely across secure LANs. This has the benefit of permitting access to remote devices for troubleshooting and monitoring purposes.

A switch contains a MAC address table that lists the MAC address connected to each switch port. When a frame enters the switch, the switch performs a lookup of the frame destination MAC address. If there is a match in the MAC address table, the frame is routed out the corresponding port. Without a MAC address table, the switch would have to flood the frame out each port.

Task 5: Clean Up

Unless directed otherwise by the instructor, turn off power to the host computers. Remove anything that was brought into the lab, and leave the room ready for the next class.