**Lab Manual for Computer Communication and Networking**

**Lab No. 3**

**Cisco IOS CLI & Basic Switch Configuration**

**BAHRIA UNIVERSITY KARACHI CAMPUS**

**Department of Software Engineering**

**COMPUTER COMMUNICATION & NETWORKING**

**LAB EXPERIMENT # 4**

Cisco IOS CLI & Basic Switch Configuration

**OBJECTIVE:**

* To perform basic IOS configuration commands.

**THEORY:**

The IOS software provides access to several different command modes. For security purposes, the IOS software provides two levels of access to commands.

The Unprivileged user mode is called user EXEC and the privileged mode is called privileged EXEC mode and requires a password. The commands available in user EXEC mode are a subset of the commands available in privilege EXEC mode.

|  |  |  |  |
| --- | --- | --- | --- |
| **Mode of Operation** | **Usage** | **How to Enter the Mode** | **Prompt** |
| User EXEC | Change terminal settings on a temporary basis, perform basic tests and list system information. | First level accessed | Switch> |
| Privileged EXEC | System administration, set operating parameters. | From User EXEC mode, enter **enable** command | Switch# |
| Global Config | Modify the configuration that affects the system as a whole | From Privileged EXEC, enter **configure terminal** command. | Switch(config)# |
| Interface Config | Modify the operation of an interface | From global mode, enter **interface** type number | Switch(config-if)# |

**TRAVERSING EXEC MODES**

* **Enter Privileged EXEC mode**

Router>**enable**

Router#

* **Enter Global Configuration mode**

Switch#**configure terminal**

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#

* **To change back to Privileged EXEC mode from Global Configuration mode**

Switch(config)#**exit**

Switch#

* **To change back to User EXEC mode from Privileged EXEC mode**

Switch#**disable**

Switch>

**SET HOSTNAME AND CONSOLE PASSWORD**

* You can name your Switch using the ***hostname*** IOS command. You name all your routes using meaningful names to ease identification and management of each Switch. This is needed, when you are working on large networks.
* To configure the host name of the Switch, run the following command

Switch(config)#**hostname Switch1**

Switch1(config)#

* You can configure authentication passwords for your Switch using IOS commands. You can configure several passwords for different types of access.
* ***Console password*** is used for console access through the console port or through a console Terminal Server. The ***line console 0***command selects the console line. Cisco devices have only one console line: console 0

Switch(config)#**line console 0**

Switch(config-line)#**password ssuet**

Switch(config-line)#**login**

* If the **login** command is not entered than the password will not be applied.
* From now on, anytime you connect to the console line you will prompt to provide a password. To disable the authentication prompt, issue *line console 0* again and enter the *no login* command.

**HOW TO SET PRIVILEGE LEVEL PASSWORD**

* **Privilege password** used for privileged mode access. This Password is not encrypted by default.
* **Unencrypted password (less priority)**

Switch(config)#**enable password cisco**

* **Encrypted password (more Priority)**

The ***enable secret***password stores the password on the Switch in encrypted form, which is more secure than ***enable password.***

Switch(config)#**enable secret ciscolab**

* **Check Running Configuration**

The ***running configuration***is the dynamic Computer that changes while the device is in normal operation mode. This includes routing tables, VLAN Computer, routing protocol configuration Computer etc.

Switch# **show running-config**

* **Verify the Password**

Switch(config)#**exit**

Switch#**exit**

**HOW TO SET USER AUTHENTICATION**

* **Creating a user and setting its password**

Switch(config)#**username ssuet password labs**

Switch(config)#**line console 0**

Switch(config-line)#**login local**

Switch(config-line)#**CTRL^Z**

Switch#**exit**

* **Displaying all users**

Switch#**show users**

**HOW TO ENCRYPT PASSWORDS**

* **Before Encrypting passwords run show running-config command to display all working authentications.**
* **Encrypting passwords**

Switch(config)# **service password-encryption**

* **Verify afterwards to ensure encryption of passwords by running-config command again.**

**HOW TO SET BANNER**

* You can optionally configure a banner for your Switch using *banner* IOS command. The purpose of a banner is to display a brief message about the Switch when you log in.
* Four types of banners are available

1. **Message of the day (MOTD) banner**
2. **Login banner**
3. **Incoming terminal connection banner**
4. **EXEC process creation banner**

* Example

Switch(config)#**banner login c** Muhammad Bilal

**OR**

Switch(config)#**banner motd** #Have a nice day#

**HOW TO SET CLOCK**

Router#**clock set 10:21:12 10 MAR 2017**

* To verify the set time, run **show clock** command on the privileged mode.

**Lab Assignments:**

* On Cisco routers, where is the running configuration loaded from?

**Ans**

The running configuration file is **stored**. **ROM** — Read-only memory (ROM) stores a bootstrap program that is loaded when the switch first powers on. This program finds the full Cisco IOS image and loads it into RAM.

* What does the flash memory on a router store?

**Ans**

The Flash memory **contains the full Operating System Image (IOS, Internetwork Operating System)**. This allows you to upgrade the OS without removing chips. Flash memory retains content when router is powered down or restarted.

* When you are logged into a router, which prompt indicates that you are in privileged mode?

**Ans**

To get into Privileged Mode we enter the "Enable" command from User Exec Mode. If set, the router will prompt you for a password. Once in Privileged Mode, you will notice the prompt changes from **">" to a "#"** to indicate that we are now in Privileged Mode.

* On which modes in Cisco's IOS you can issue show commands?

**Ans**

They are as follow;

* User execution mode
* Privileged execution mode
* Global configuration mode
* Interface configuration mode

**NOTE:**

Answers to the other questions must be given on a separate sheet, typed or handwritten with proper numbering. Any other formats apart from the above will not be entertained.

**TIME BOXING:**

|  |  |  |
| --- | --- | --- |
| **Activity Name** | **Activity Time** | **Total Time** |
| **Instruments Allocation + Setting up Lab** | 10 mints | 10 mints |
| **Walk through Theory & Tasks (Lecture)** | 60 mints | 60 mints |
| **Implementation & Practice time** | 90 mints | 80 mints |
| **Evaluation Time** | 20 mints | 20 mints |
|  | Total Duration | 180 mints |

**Teacher Signature**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Student Registration No**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_