Lab 01 – Intro to Cisco IOS and Basic L2 LAN Switching

For this lab, you will:

1. Create a network topology within Cisco Packet Tracer using the following information:

   - ✓ PC11's FastEthernet connection is connected to interface F0/11 on Switch1

   - ✓ PC21's FastEthernet connection is connected to interface F0/11 on Switch2
   - ✓ PC22's FastEthernet connection is connected to interface F0/12 on Switch2

   - ✓ PC31's FastEthernet connection is connected to interface F0/11 on Switch3
   - ✓ PC32's FastEthernet connection is connected to interface F0/12 on Switch3
   - ✓ PC33's FastEthernet connection is connected to interface F0/13 on Switch3

   - ✓ PC41's FastEthernet connection is connected to interface F0/11 on Switch4
   - ✓ PC42's FastEthernet connection is connected to interface F0/12 on Switch4
   - ✓ PC43's FastEthernet connection is connected to interface F0/13 on Switch4
   - ✓ PC44's FastEthernet connection is connected to interface F0/14 on Switch4

   - ✓ PC51's FastEthernet connection is connected to interface F0/11 on Switch5
   - ✓ PC52's FastEthernet connection is connected to interface F0/12 on Switch5
   - ✓ PC53's FastEthernet connection is connected to interface F0/13 on Switch5
   - ✓ PC54's FastEthernet connection is connected to interface F0/14 on Switch5
   - ✓ PC55's FastEthernet connection is connected to interface F0/15 on Switch5

   - ✓ Switch1's interface F0/17 is connected to interface F0/17 on Switch2
   - ✓ Switch1's interface F0/18 is connected to interface F0/18 on Switch2
   - ✓ Switch1's interface F0/19 is connected to interface F0/19 on Switch3
   - ✓ Switch1's interface F0/20 is connected to interface F0/20 on Switch3

   - ✓ Switch2's interface F0/21 is connected to interface F0/21 on Switch4
   - ✓ Switch2's interface F0/22 is connected to interface F0/22 on Switch4
   - ✓ Switch3's interface F0/23 is connected to interface F0/23 on Switch5
   - ✓ Switch3's interface F0/24 is connected to interface F0/24 on Switch5

   - ✓ PC11's IP Address is 172.30.11.111/16

   - ✓ PC21's IP Address is 172.30.12.121/16
   - ✓ PC22's IP Address is 172.30.12.122/16

   - ✓ PC31's IP Address is 172.30.13.131/16
   - ✓ PC32's IP Address is 172.30.13.132/16
   - ✓ PC33's IP Address is 172.30.13.133/16

- ✓ PC41's IP Address is 172.30.14.141/16
- ✓ PC42's IP Address is 172.30.14.142/16
- ✓ PC43's IP Address is 172.30.14.143/16
- ✓ PC44's IP Address is 172.30.14.144/16

- ✓ PC51's IP Address is 172.30.15.151/16
- ✓ PC52's IP Address is 172.30.15.152/16
- ✓ PC53's IP Address is 172.30.15.153/16
- ✓ PC54's IP Address is 172.30.15.154/16
- ✓ PC55's IP Address is 172.30.15.155/16

- ✓ Switch1's administrative vlan interface IP Address is 172.30.1.11/16
- ✓ Switch2's administrative vlan interface IP Address is 172.30.1.12/16
- ✓ Switch3's administrative vlan interface IP Address is 172.30.1.13/16
- ✓ Switch4's administrative vlan interface IP Address is 172.30.1.14/16
- ✓ Switch5's administrative vlan interface IP Address is 172.30.1.15/16

- ✓ PC11's RS232 connection is connected to the console line on Switch1
- ✓ PC22's RS232 connection is connected to the console line on Switch2
- ✓ PC33's RS232 connection is connected to the console line on Switch3
- ✓ PC44's RS232 connection is connected to the console line on Switch4
- ✓ PC55's RS232 connection is connected to the console line on Switch5

- ✓ Remember to use straight-through cables when making the PC to Switch connections.
- ✓ Remember to use cross-over cables when making the Switch to Switch connections.

Please NOTE: For your subnet mask, /16 = 255.255.0.0

You should specify all of your IP Addresses and subnet masks (in bit notation) within individual text boxes on your topology diagram for each interface or device that has one assigned. Make sure the interfaces are visible in your topology diagram as well.

2. Using the network topology from above, complete the following:

   a) On each PC, configure:
      - ✓ IP Address
      - ✓ Subnet Mask

   b) On each Switch, configure:
      - ✓ hostname
      - ✓ an unencrypted privileged mode password of 'cisco'
      - ✓ the IP Address and Subnet Mask of the Administrative vlan interface of "int vlan 1"

- ✓ enable 'logging synchronous' on the console line *(This enables the console line to synchronize the device with the terminal emulation program.)*
- ✓ password of 'cisco' on the console line
- ✓ enable a login prompt to appear when consoling into the switch from the PC
- ✓ enable 'logging synchronous' on the first sixteen virtual terminal lines
- ✓ password of 'cisco' on the first sixteen virtual terminal lines
- ✓ enable a login prompt to appear when using the first sixteen virtual terminal lines (ie: when you telnet into the switch from the PC you should receive a login prompt)
- ✓ save your current configuration file named running-config (stored in RAM) to the configuration file named startup-config (stored in NVRAM)
- ✓ display your interfaces in use in an abbreviated format (ie: show ip int brief)

c) Verify each PC is able to reach the other PCs and the Switches within the topology using the Windows CLI commands you learned in class. Provide screenshot captures of the output within your lab report for the verification. You may choose one PC as a testing point and include all of the output from that particular PC for this verification. Is this feasible to test connectivity to each host within the network manually? What could you do to improve upon the efficiency of testing connectivity?

d) After you have successfully verified connectivity, choose one PC and display the local ARP cache. Provide a screenshot capture of the output.

e) After you have successfully verified connectivity, choose one Switch and display the mac address table. Provide a screenshot capture of the output.

f) What do you think is occurring with the redundant switch to switch connections? Are they both actively forwarding traffic?

Please NOTE: When you provide a screenshot capture, please do not capture the entire screen. Minimize this to a specific window or output you are focusing on.

Please NOTE: Download and install Cisco Packet Tracer. This software is supported on Windows, macOS, or Linux. The switch model you will be using in Cisco Packet Tracer is the 2960 L2 Workgroup Switch for this lab.

Make sure you save your packet tracer file frequently (and make a backup copy) so you do not lose your work in case the application crashes. It is always nice to revert back to a previous backup in case the file is corrupt.

3. Create a lab report document and include the following information:

    a) **Description:** Brief Description of what topic or technology you are concentrating on within this lab. Keep this short and to the point.

    b) **Topology/Diagram:** Take the original topology you created within Cisco Packet Tracer and take a screenshot of the topology. Paste this into your Document. Please do not submit a screen capture of your entire screen or window. This should ONLY be of the topology. Make sure you include IP Addresses in your topology with the interfaces showing.

    c) **Syntax:** Table of Command Syntax and the associated description (ie: If you issued a cli command within the Cisco IOS or within the Windows CMD prompt, list it here and write a description as to what it does in your own words) – please make sure this is written in a nice, easy-to-read table format. (CLI Command on the left, description on the right, and (optionally) add another column for what mode of Cisco IOS you are in when issuing the CLI command.)

    d) **Verification:** This is screenshot based. You will be asked to provide screenshots to verify that you have completed the assignment correctly. Please only include the screenshots I ask of you. Nothing more, unless indicated such as providing additional illustrations or if I've asked you to answer a question directly. These are listed above within the specifications.

    e) **Conclusion:** Wrap up your lab report with a short conclusion. If something did not work, state it. If everything did work successfully, state that as well.

    Please NOTE: Your submission should not include one screenshot per page. Please maximize the space on each page. The lab report should (most likely) be less than four or five pages – It could even be two to three pages in length depending upon the screenshots I ask you to submit for verification. Please make sure the screenshots are legible though!

4. Submit your lab report as a .pdf file and your .pkt to the appropriate assignment within iLearn. <u>This lab should be completed individually.</u>

<u>(Please do not zip these files nor should you submit multiple .pngs, .gifs, .jpgs, etc…)</u>

Good Luck with your first lab!