**Lab Instructions**

**Part 1**: **Written Portion:**

Using Microsoft Word, write a 1-page APA formatted essay on all connection methods for Cisco devices. This includes telnet, console, auxiliary, and SDM. Explain how each connection method works and be sure to include all relevant information to connect to a router or switch using these methods.

Cisco devices can be connected to a number of ways however, I have found it easiest to make the initial connection to the console port of a switch or router. Cables I have used to connect to this port are rollover, rj45 to db-9 and rj45 to db-25 although I have not seen this often. When connection via a serial connection to the console port of the device, I use terminal emulation software like Putty which can provide SSH, telnet, serial, raw and Rlogins. The configurations on the serial connection should also be changed to have a baud rate of 9600, no parity or flow control, 8 data bits and one stop bit. An admin could control the access to this console port by placing the devices in a locked room or by using the commands, line con 0, password mypassword, login, to set a password when making that console connection.

Another type of connection that can be made to cisco device is telnet, which is a TCP oriented protocol that grants a command line into other devices. Telnet is also unencrypted and may not even require authentication to connect to various ports. Telnet can be used as more than just a remote command line but also a way to identify services (or grab banners) using telnet to connect to other ports. Telnet on Cisco devices uses the vty lines to provide the telnet connection. To enable telnet, an admin could use the following commands, line vty 0 15, and transport input telnet. To secure these lines an admin could use the password mypassword, login commands and save the running config to the startup config. Once telnet was setup, Putty or a Unix terminal could be used to make that connection (Unix has ssh, telnet via command line).

A better solution to using Telnet would be to setup SSH to provide a remote command line. SSH uses TCP on port 22 and encrypts the data. SSH will also require authentication and can further be secured by setting up keys. These SSH keys would be needed in order to make the SSH connections. Setting up SSH is like the telnet setup, the commands I used are, cyrpto key generate rsa (1024 bit), line vty 0 15, transport input ssh, login local, password mypassword, login, exit. The reference I used goes more in depth on the setup. Putty can be used to make the SSH connection either with a username and password or with the keys.

The AUX port on cisco devices generally is used to give dial-in access to the router or as a backup console port. Both the AUX and Console ports can use a rollover cable in order to provide a CLI (command line interface). From what I understand the AUX port is flexible and can also be used to connect to other aux ports and to modems in order to provide PPP connections and other routing protocols. As an example, the article from Cisco I am referencing uses a rj45 to db-25 to connect the AUX port to a modem. Some of the commands used to setup the connection once the cable is connected are show line (to determine the line), line 65, modem inout, speed #, transport input all, flow control hardware, login, password. Another setup I had watched used the AUX port to provide a telnet connection. The commands used in this were line aux 0, transport input telnet, and show line (determine the line is up and line #). After this telnet was available on the aux port. From what I understand to telnet into different ports, Cisco devices use port 2000 plus the line number. As an example, if the line were #1, the telnet command would be telnet ip 2001.

SDR or Cisco Security Device Manager is essentially a web-based GUI for configuring cisco devices. Much like consumer routers where a user would connect to the LAN upon setup, enter the default credentials and be able to change settings on the router. SDR provides wizards to make the configuration process simpler, since it does not require an individual to understand the Cisco CLI. SDR uses SSL (Secure Socket Layer Connection) to provide secure connections from a browser to the Cisco device. In the document I am reading they suggest using SDR over the WAN to monitor and edit configurations on Cisco devices in remote locations. I don’t know how enthused I would be having an app the controls the network facing the WAN, but this is my opinion. SDR seems a good way to configure Cisco Devices without knowledge of the Cisco CLI or if a user just wanted the GUI version of a setup. Even with knowledge of the CLI, SDR may still be used because of its ease of use. In a sense this provides a lot of the same features of telnet, serial and aux connections, or any of the methods of gaining a command line on a Cisco device. The web-app would allow for changing a lot of the same configurations that can be found in the CLI.

There are plenty of connection methods for Cisco devices. I believe which connections to use depends on the requirements for security that an organization may have. As an example, I would always use SSH over telnet, unless I was only using telnet for a setup then disabling it for SSH. The AUX and Console seem like secure ways to provide access to the command line securely. By placing devices behind a locked door and only using as an example console for access, then it’s safe to assume that they only way for someone to make changes would be through that locked door and through the console which would have a password (protocols/services device is using could also be a unwanted way in). In a sense this almost eliminates possible remote attempts at a CLI from remote devices. SDR also seems like a beneficial connection method but I believe I would use a vpn (site to site) over WAN as opposed to having that management browser facing the internet.

“Basic Router Configuration Using SDM.” *Cisco*, 19 Aug. 2016, www.cisco.com/c/en\_intl/support/docs/cloud-systems-management/router-security-device-manager/71305-basic-router-config-sdm.html.

CertBros. “How to Enable Telnet on a Cisco Switch or Router.” *YouTube*, YouTube, 6 Apr. 2015, www.youtube.com/watch?v=cb7jCMNJLkQ.

*Cisco Newsroom | The Network*, newsroom.cisco.com/dlls/.

“Configuring a Modem on the AUX Port for EXEC Dialin Connectivity.” *Cisco*, 11 May 2017, www.cisco.com/c/en/us/support/docs/dial-access/asynchronous-connections/10318-mod-aux-exec.html.

“Configuring Secure Shell on Routers and Switches Running Cisco IOS.” *Cisco*, 5 June 2017, www.cisco.com/c/en/us/support/docs/security-vpn/secure-shell-ssh/4145-ssh.html.

“Console vs Auxiliary Port.” *The Cisco Learning Network*, 1 May 2013, learningnetwork.cisco.com/thread/31752.

“How Do I Connect to the Console and AUX Port of My Router?” *SearchNetworking*, searchnetworking.techtarget.com/answer/How-do-I-connect-to-the-console-and-AUX-port-of-my-router.

“RF Wireless World.” *Advantages of TELNET | Disadvantages of TELNET*, www.rfwireless-world.com/Terminology/Advantages-and-Disadvantages-of-TELNET.html.

Semperboni, Fabio. “Fabio Semperboni.” *CiscoZine*, 25 Sept. 2015, www.ciscozine.com/access-to-the-console-via-aux-port/.

Yadav, Santosh, and Ramesh Natarajan. “7 Elasticsearch Basic CRUD Operation Examples – Index, Update, Get and Delete.” *The Geek Stuff*, 21 May 2019, www.thegeekstuff.com/.

**Part 2**: **LabSim:**

Complete the following in LabSim and submit the required screenshots, along with Part 1, to this unit's lab Dropbox. Take a screenshot after each lab practice or simulation subsection and then copy and paste all the screenshots into the same document you use for Part 1.

5.1.3 Practice questions- Take screenshot

5.2.4 Practice questions- Take screenshot

5.3.7 Find device information- Take screenshot after simulation

5.3.8 Practice questions- Take screenshot

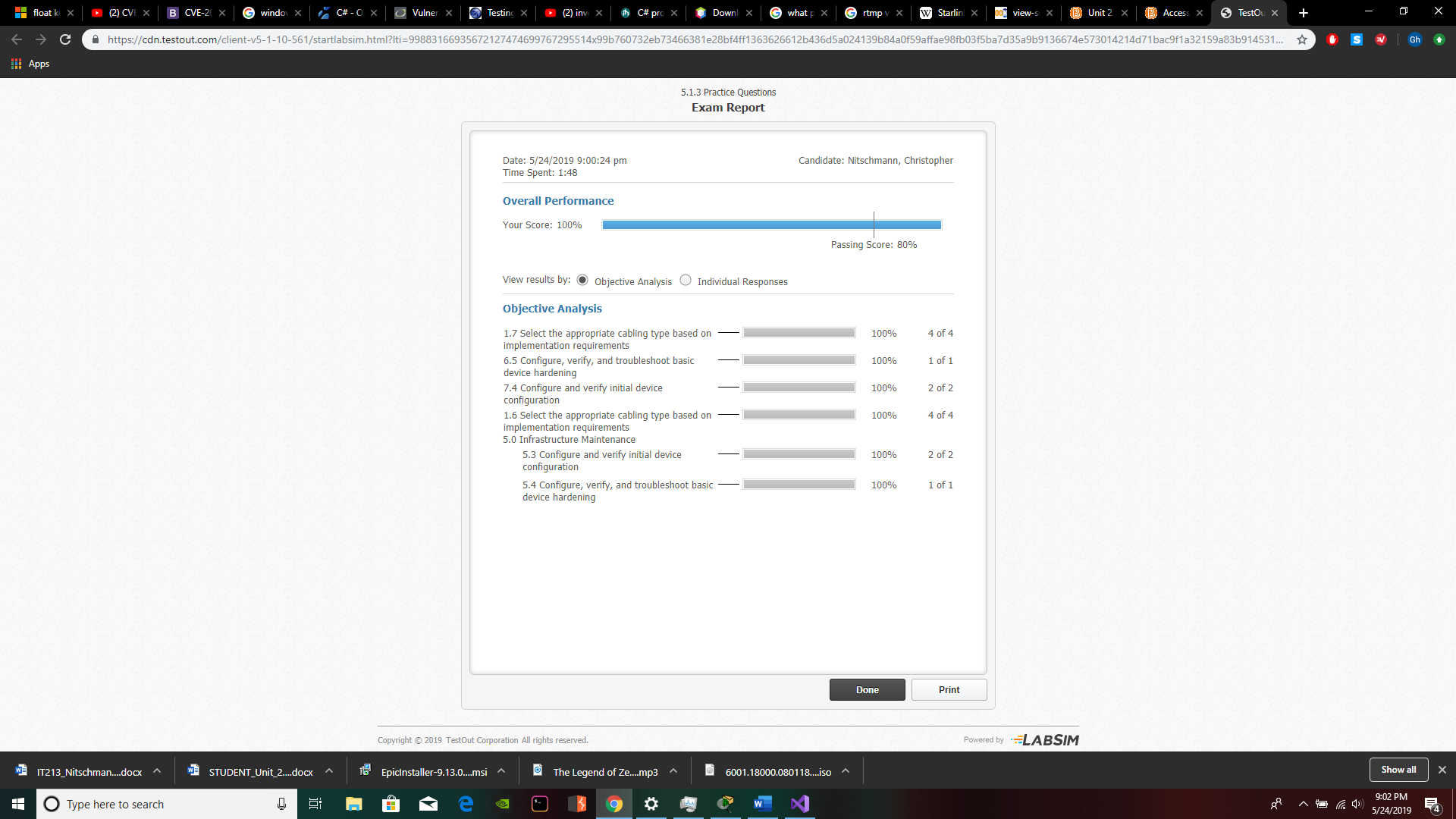
5.4.5 Practice questions- Take screenshot

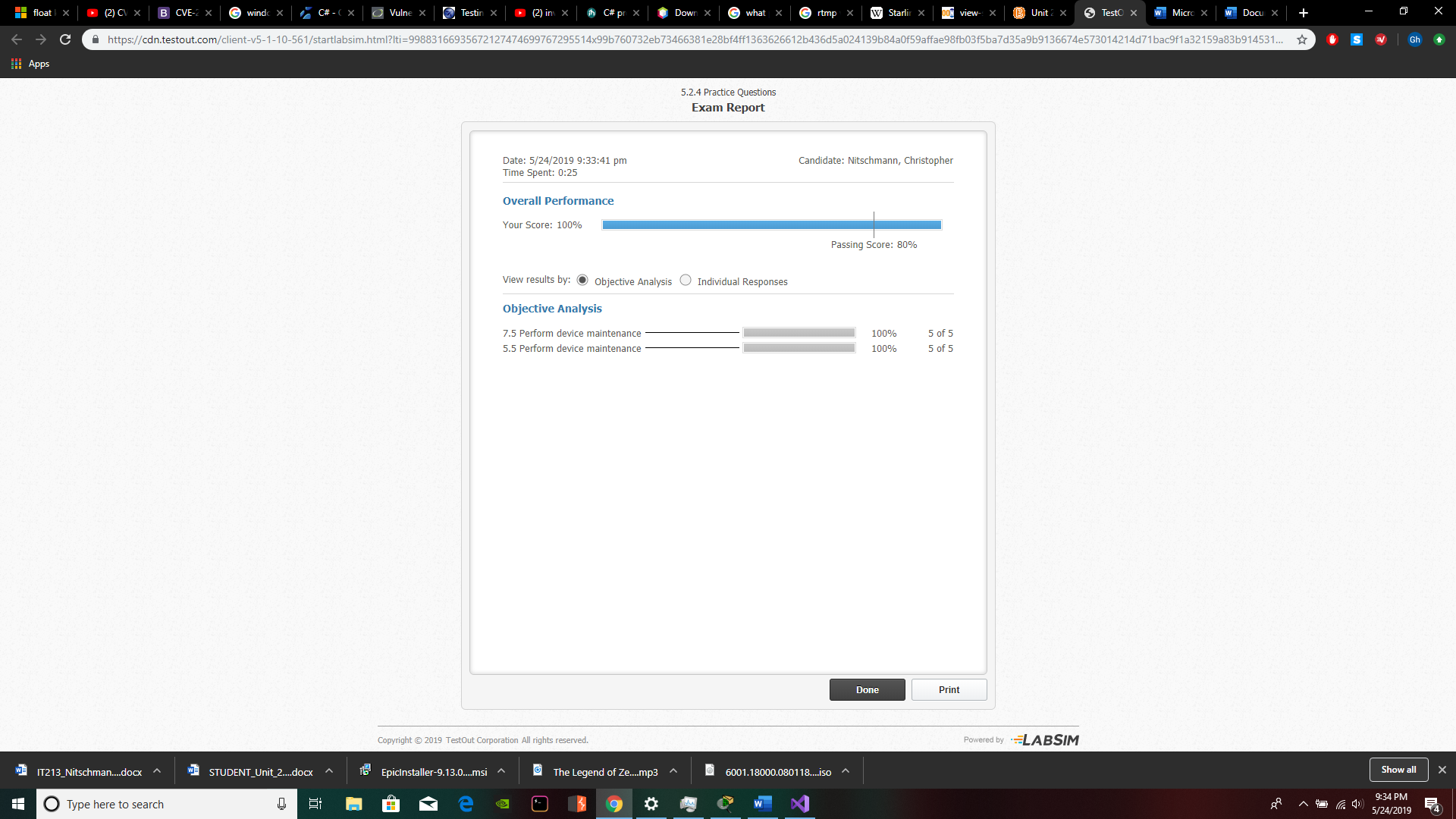
5.5.3 Configure hostnames and descriptions- Take screenshot after simulation

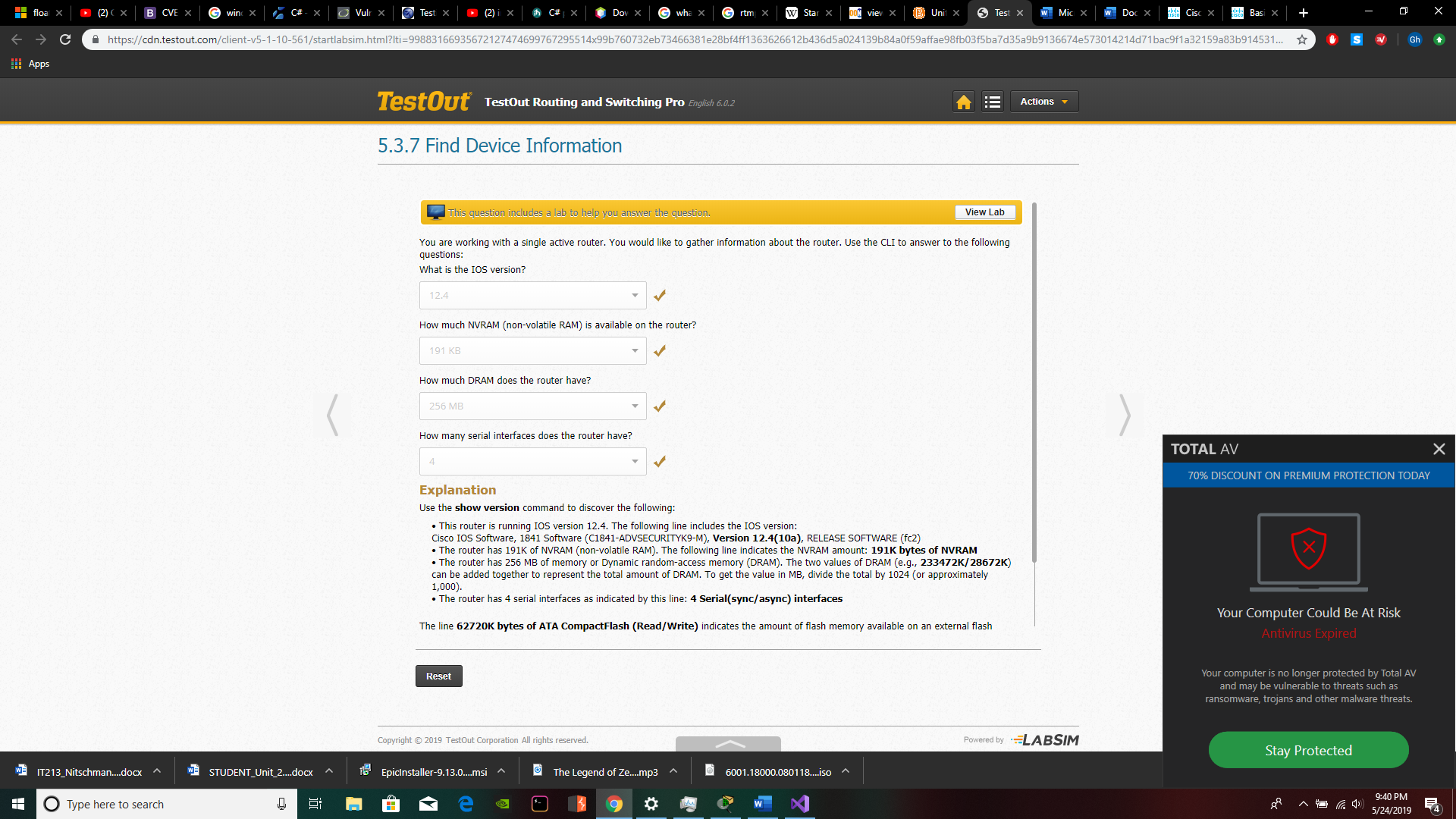
5.6.3 Set console and VTY passwords- Take screenshot after simulation

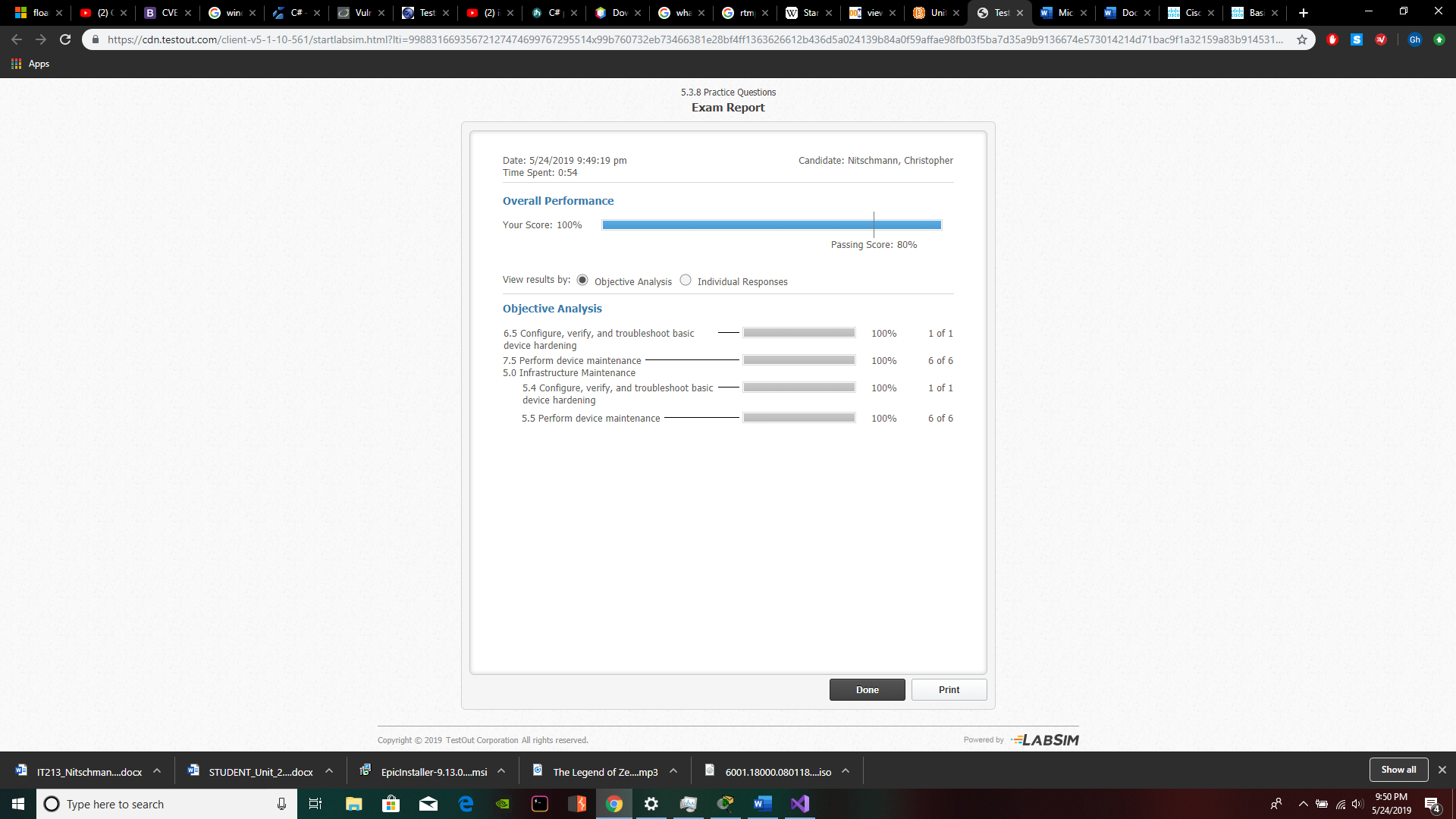
5.6.5 Exploring enable passwords- Take screenshot after simulation

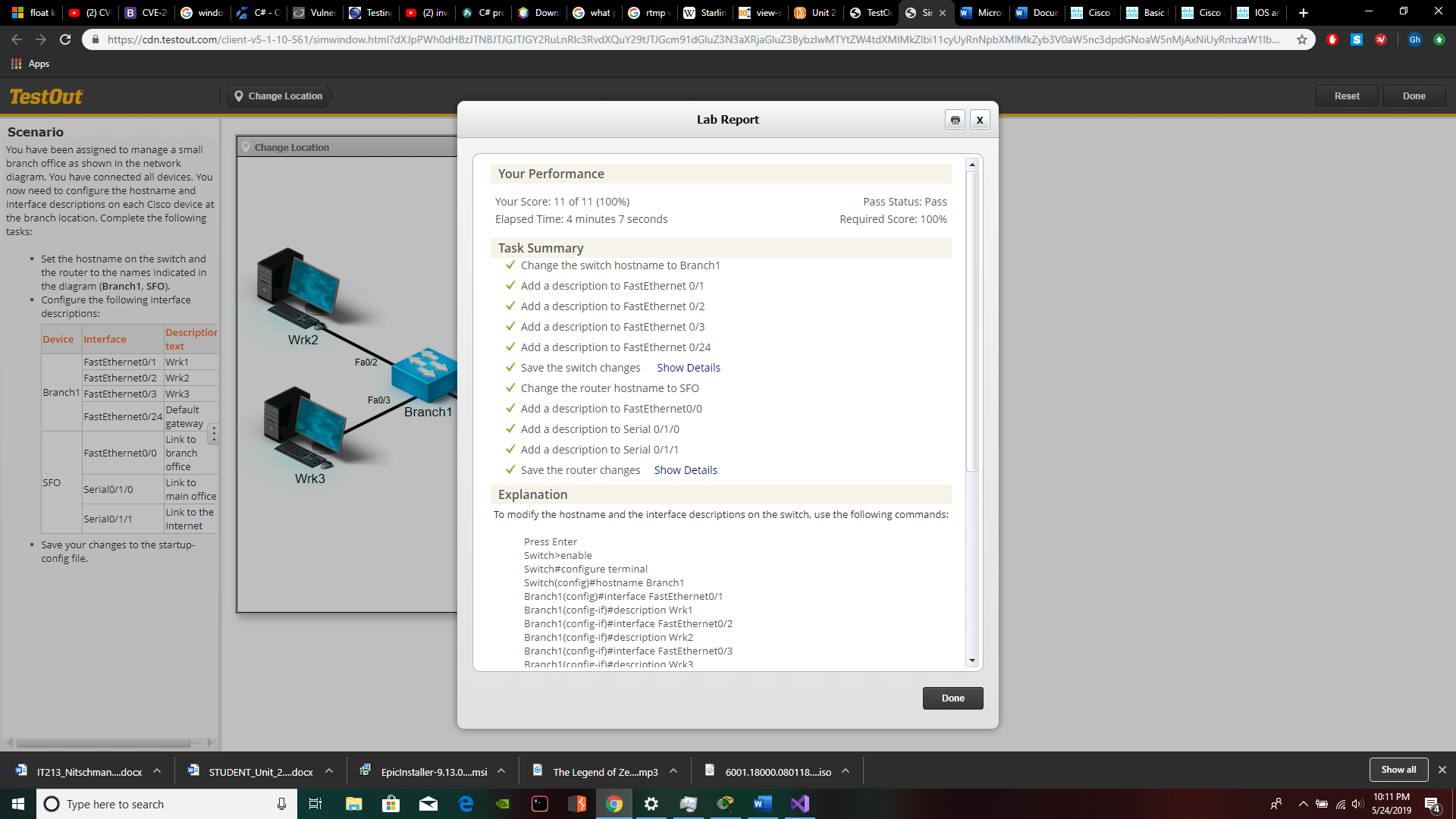
5.6.9 Practice questions- Take screenshot

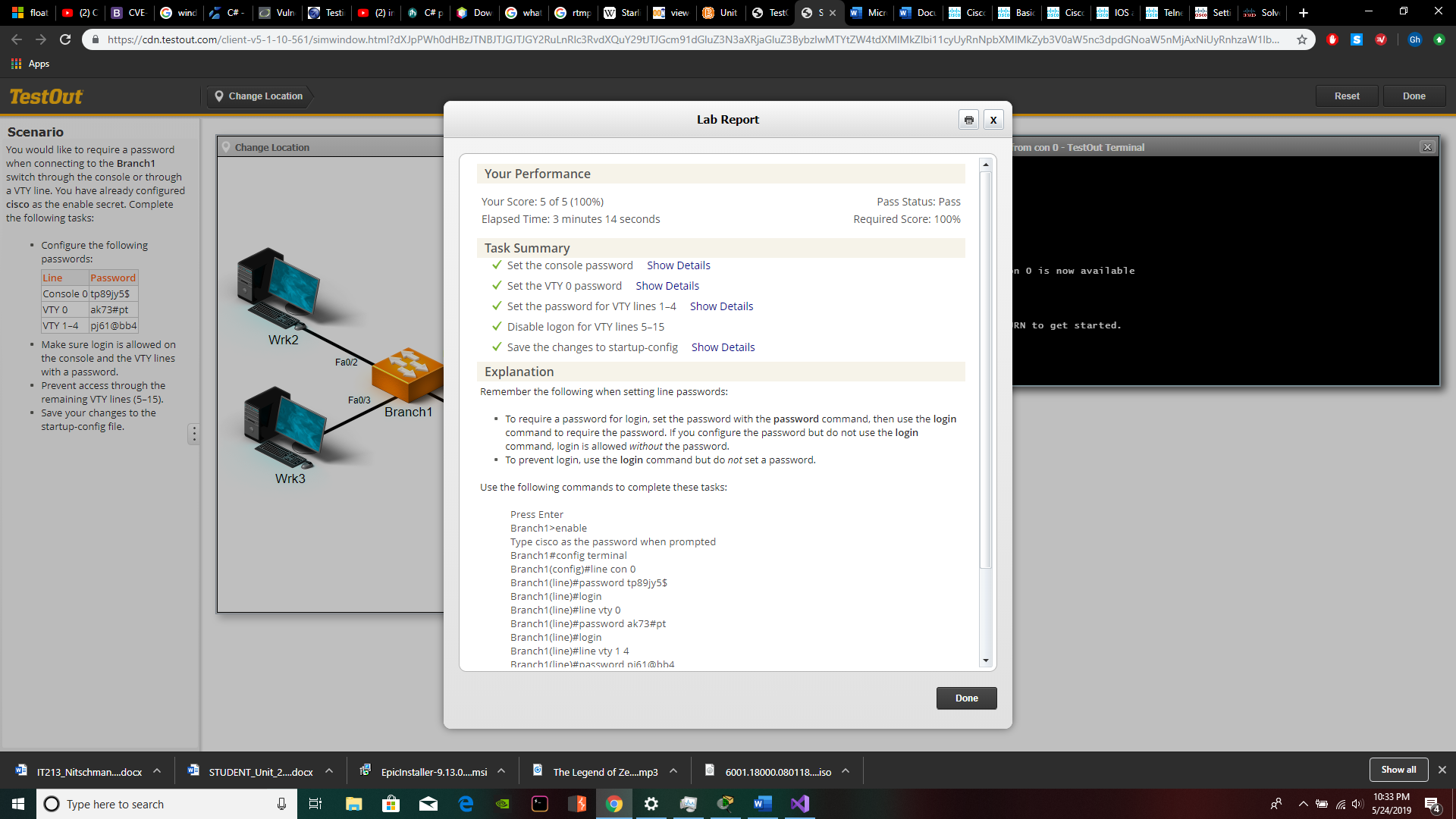










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