**Mid Term Script**

Directions: Complete each of the scripts below and submit them by the date specified in the assignment sheet and Blackboard. Submit **copies of your code** and **screenshots of the code running with each task**. Also, be sure to use the document, **Script Requirements as a guide** to writing good code. **Full credit will not be earned if you do not meet these script requirements.** **80 points**

**Note: Since we are running APIs on the NXOS switches in this lab, be sure to run the feature nxapi command from global configuration on each switch before attempting to send and API request.**

1. **(65 points) Due to a network upgrade that will add more fault tolerance to your network, your team has determined that you need to change your IP addresses on all VLAN interfaces on your switches. You have hundreds of switches, each with anywhere from 5 to 100 VLAN interfaces. You mention that you are familiar with Python and NXOS switches, and that you are willing to write a proof-of-concept script that will change the VLAN interface addresses on one switch. Once that is working, your team will give you the go ahead to roll out the script. You will be able to utilize parts of scripts written earlier this semester to complete the following:**
   1. **Write a script that increases all the IP addresses on VLAN interfaces only, by 5 for one device. You must either read the device’s IP address from a dictionary object you create at the beginning of your script or prompt your user for the IP address of the device. No hard coded addresses are allowed in your function call to change the IP address. For example, if a VLAN interface has an address of 172.16.101.2, your program will change it to 172.16.101.7.**
   2. **You can assume all addresses for this script are /24**
   3. **You cannot hard-code your IP addresses or interfaces. Instead, your script will connect to your device and iterate its interfaces, changing them one at a time.**
   4. **When your script is done, have it re-iterate through the interfaces with a show ip interface brief to show that your changes were successful.**

**Hint: Test your script in small parts, and consider the following approach as a guideline (it’s not required that you use the following approach, but it is suggested):**

1. **This script can start with your show ip interface brief script written earlier in the semester as a structure. I recommend copying the script to a new script so that you can keep your earlier version intact for reference. You will use the returned structure (nested dictionary) to iterate through your interfaces and their addresses. For the next few hints, I suggest printing out your results of your changed IP addresses before considering generating the actual code to change your addresses**
2. **Start with only printing out interfaces that start with a “V” –VLAN interfaces. In other words place the print line from your show ip interface brief, inside an “if” block**
3. **Within the “if” block, capture the interface name and the current IP address on the interface each time through the nested dictionary (response) containing the interfaces, and change the IP address programmatically (i.e., add 5 to the current address, but don’t worry about changing it on the switch yet) before printing it out. You can use the split() method, math, and concatenation to change an IP address variable sent to a function. Don’t update the response dictionary. Just print out your updated IP address to make sure it is working.**
4. **Once you have successfully converted an IP address string and once it prints out correctly, you are ready to replace the print with a function that changes a single interface. This will also be done on each iteration. You will want to use the NX-API Sandbox to generate some Python code for the commands, configure terminal, interface VLAN 101, IP address 172.16.101.7 255.255.255.0. You will hard code the values into the API to generate code that you can modify like you did for the hostname application earlier this week, and once you paste the code to your new script, you can modify the appropriate lines of code.**
5. **You will want to replace the print statement now with a function that runs the code from the NX-API Sandbox. Be sure to indent everything properly, including the final request() line.**
6. **At this point, your script should run. Don’t forget to simply run another show ip interface brief, formatted like below (only the addresses will show the VLANs 5 numbers higher now), once your changes are made. You already have this code and you will simply be adding it to the end of your script. Your addresses should reflect the changed addresses (i.e., your fourth octet increased by 5).**



1. **(15 points) Update the script above by adding a dictionary that lists your devices:**
   1. **devices = {**

**“dist-sw01” : “10.10.20.177”,**

**“dist-sw02” : “10.10.20.178”**

**}**

* 1. **Have your program change the VLAN interfaces as described in number 1, on both devices. You must use iteration (i.e., iterate through the dictionary, devices) to change their addresses.**

**Multiple screenshots of a successful IP change:**

**Text

Description automatically generated**

**Background pattern

Description automatically generated**

**Text

Description automatically generated**

**Graphical user interface, text, application

Description automatically generated**

**Text

Description automatically generated with medium confidence**

**Text

Description automatically generated**

**Screen shots of changed Ips in switch configuration in the webrowser:**