Network Controller Exercise

1. In this lab, we will be installing a network controller to manage our devices with. Once this controller is set up and it is managing devices, we can send scripts to manage or query the controller.
2. From PCs Drop Network Controller into the topology and hook up interface GigabitEthernet 0 on the controller to interface G1/0/2 on Switch 1 which is set up for VLAN 100:

Graphical user interface, application

Description automatically generated

Diagram

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1. Assign the address 192.168.1.200 /24 and default gateway to GigabitEthernet0 on the controller

Graphical user interface

Description automatically generated

Graphical user interface, application

Description automatically generated

1. Configure the controller tab as shown:

Graphical user interface, text, application

Description automatically generated

1. In Packet Tracer, update the preferences as shown below:

Graphical user interface, text, application, email

Description automatically generated

1. From a Chrome browser on your physical PC, enter the following URL:
   1. https:\\localhost:58000
2. You will be asked to create an account to log in with. Use student/cisco as your credentials
3. Graphical user interface, application

   Description automatically generated
4. Login with new credentials (student/cisco)
5. You will see a dashboard screen like below:

Graphical user interface, application

Description automatically generated

1. You are now accessing the controller. You will want to discover your devices so that you can manage them:
2. From menu (circled above) choose provisioning. Then set up credentials and add credentials. You will add the ssh credentials (already configured as admin/cisco) and enable secrets (enable sec=class)

Graphical user interface

Description automatically generated with medium confidence

1. Choose discovery and enter info for nearest switch. Select credentials from drop down list:

Graphical user interface, text, application, email

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

1. Once the discovery is done running, you will see a screen like the one below when you click on Network Device:

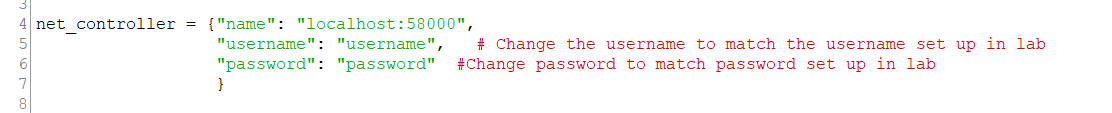
Graphical user interface, application

Description automatically generated

1. You are now ready to access the controller with python scripts.

**Controller Scripts**

1. I am providing the script for this assignment. Be sure to rename it .py once you download it
2. You will need to run this on your local computer. Be sure to install python from Python.org:
   1. **Install Python Windows:**
      1. Go to [www.python.org/downloads/](http://www.python.org/downloads/)
   2. Download and install the latest version of Python
   3. From command prompt, type *pip install requests*
3. Open The PTController.py script
4. Note that the dictionary would be updated to match the current username password defined for the controller. For this lab, we used student/cisco



A picture containing text

Description automatically generated

1. Add the following to the main part of the script and run:
   1. serviceTicket = get\_ticket(controller,username,password)
   2. print(serviceTicket)
   3. Note that this is the security token that is passed to the controller for calls. Take some time to study the get\_ticket() function to see how it is working
2. Next, add the following to the script and run:
   1. hosts=get\_hosts(controller,serviceTicket)
   2. print(hosts)
   3. Note that controller is the URL, defined in the script and serviceTicket is the value returned from the function call in step 4
   4. Examine the list returned from the call and examine the initial function call. Note that it is a list of PCs from the topology**. Add to the script to iterate the list to print a list of PCs with their names and IP addresses.**
3. Next, add the following to the script and run:
   1. devices=get\_devices(controller,serviceTicket)
   2. print(devices)
   3. Note that controller is the URL, defined in the script and serviceTicket is the value returned from the function call in step 4
   4. Examine the list returned from the call and examine the initial function call. Note that it is a list of devices from the topology**. Add to the script to iterate the list to print a list of devices with their hostnames, IDs (IDs will end in ‘uuid’) and IP addresses.**
4. Next, add the following to the script and run:
   1. device= get\_single\_device(cont,serviceTicket,dev\_id)
   2. print(device)
   3. Note that controller is the URL, defined in the script, serviceTicket is the value returned from the function call in step 4, and id is an ID from a single device that was printed out in step 6.
5. Flow Analysis allows us to look at the devices and their statuses that exist between two endpoints. Try adding the following to the script:
   1. flow = run\_flow\_analysis(controller,serviceTicket,source\_ip, destination\_ip)
   2. print(flow)
   3. Note that source\_ip and destination\_ip are ip address strings. Make sure they have values before running this code.
   4. Try iterating the list that is returned. Note that the ID is returned in this list, making it easy to get further information from either the hosts or devices list.
6. **Main Script Assignment**
   1. **Write a script that asks for two endpoints. Verify that both endpoints exist in the hosts list (you will have to retrieve the hosts list). If the addresses are valid hosts, pass them to the run\_flow\_analysis() function provided by me**
   2. **Then pass the list to a function that you write, called, printFlow(). You will use the get\_devices(), get\_single\_device(), and get\_hosts() function to extract the appropriate information to print out the following (assuming 192.168.1.100 and 192.168.2.100 are the source and destination IP addresses):**

Graphical user interface, application

Description automatically generated

**Hint 1: If the device in the flow list is a PC, simply extract its name and IP address. You will then hardcode the value of PC for type. The remaining columns should be blank for PCs as shown above.**

**Hint 2: The ID is a field that can help you corelate your lists to get the information that you need.**