PT Lab – SDN Network Controller

Background

Network administrators have used simple automation tools such as bash scripts, Python, NETconf, RESTconf, Ansible, or SNMP-enabled software to complete basic automation processes. With the introduction of Software Defined Networking (SDN), this process has been greatly enhanced. Packet Tracer provides a simple PT-Controller to simulate an SDN controller.

Note: To learn more about Packet Tracer's implementation of the Network Controller, click the **Help** menu, then **Contents**. In the Index on the left, about midway down, you will find the heading **Configuring Devices**. Underneath this heading, find **Network Controllers**. Here you will find a wealth of information, much of which you will explore in the activities in this course.

Download and Install Packet Tracer

You can download the latest Packer Tracer for Linux from Netacad. This example uses: Packet Tracer 8.0. After downloading Packet Tracer to your Downloads folder, install the application from the terminal:

```
cd Downloads

sudo chmod +x PacketTracer_800_amd64_build212_final.deb

sudo apt install ./PacketTracer_800_amd64_build212_final.deb
```

Topology
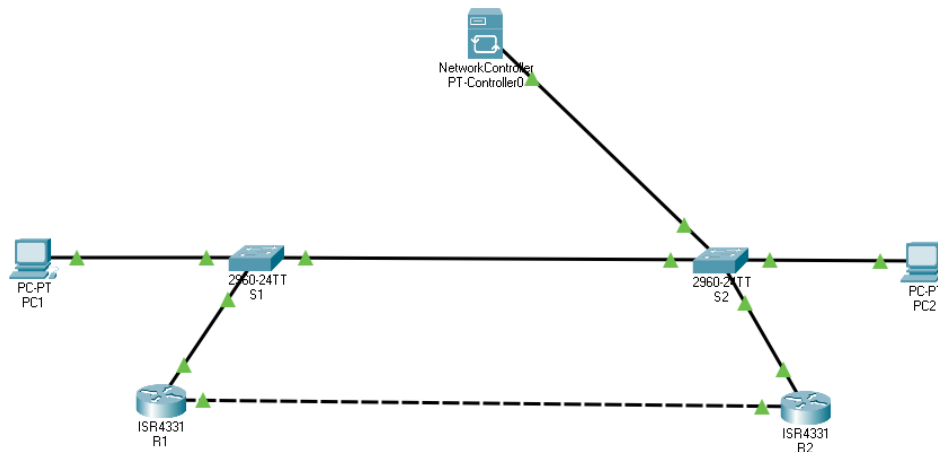
Device Name	Type	IP Address	Subnetmask	Gateway
R1	Router	192.168.1.1	255.255.255.0	NA
S1	Switch	192.168.1.2	255.255.255.0	192.168.1.1
R2	Router	192.168.1.3	255.255.255.0	NA
S2	Switch	192.168.1.4	255.255.255.0	192.168.1.3
PC1	PC	192.168.1.100	255.255.255.0	192.168.1.1
PC2	PC	192.168.1.200	255.255.255.0	192.168.1.3
PT-Controller0	Network Controller	192.168.1.10	255.255.255.0	NA

Account information: username – **admin**   password – **cisco**   secret – **class**

Instructions

Part 1:   Configure the PT-Controller

Step 1: Add a Network Controller to the topology.

a. Add a Network Controller above and between the two switches.

b. Name the controller **SDN**.

c. Connect the controller's **GigabitEthernet0** interface to S2's **GigabitEthernet0/2** interface.

Step 2: Configure connectivity for the Controller.

a. Configure the Default Gateway's IP address to **192.168.1.1**.

b. Configure the GigabitEthernet0's IP address to **192.168.1.10** with a Subnet Mask of **255.255.255.0**.

c. If needed, enable access to the Real-World Controller.

d. Verify and troubleshoot the connection as needed.

e. Open a browser on your computer and type the address **127.0.0.1:58000**.

f.   Register a new user account and log into the controller using the account information above.

Part 2:   Use the SDN Controller to Discover the Topology

Step 1: Add credentials to access all the network devices in the topology.

a. Use these credentials:

- Username: **admin**

- Password: **cisco**

- Enable Password: **class**

- Description: **Network**

Step 2: Use DISCOVERY to locate all the devices on the network.

a. Use CDP to locate all six devices in the network. Use the addressing table above for name and IP address information. Do not include the ISP.

b. All devices should be visible on the Dashboard.

c. Verify and troubleshoot as needed.

Part 3:   Use an SDN Controller to Configure Network Settings

Step 1: Configure a global policy for DNS and NTP.

a. DNS: Domain Name – **company.com** and IP Address – **146.52.80.20**.

b. NTP: IP address – **146.52.80.20**.

c. Save and Push the configuration to the network devices.

d. Verify and troubleshoot as needed.