Homework #3

Due Time: 2018/4/15 (Sun.) 22:00
Contact TAs: `vegetable@csie.ntu.edu.tw`

Submission

- Compress all your files into a file named **HW3_[studentID].zip** (e.g. `HW3_bxx902xxx.zip`), which contains a folder named **[studentID]_NA**.
- **Folder [studentID]_NA** should contain **a .pka and a .pkt file** as indicated in the questions, as well as one pdf file named **na1.pdf** containing all your other answers in *Network Administration Part 1.*
- Submit your zip file to Ceiba.
- For *Network Administration Part 2*, we will release the registration form for demo soon on the course website.

Instructions and Announcements

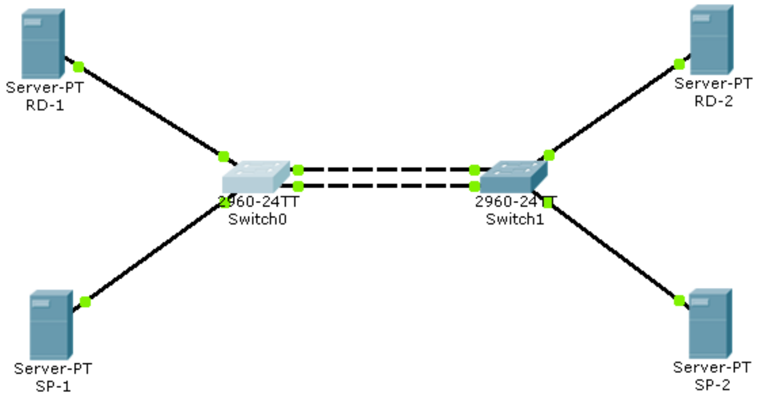
- Discussions with others are encouraged. However, you should write down your solutions **in your own words**. In addition, for **each and every** problem you have to specify the references (the URL of the web page you consulted or the people you discussed with) on the first page of your solution to that problem.
- Problems below will be related to the materials taught in the class and may be far beyond that. Try to search for additional information on the Internet and give a reasonable answer.
- Some problems below may not have standard solutions. We will give you the points if your answer is followed by reasonable explanations.
- **NO LATE SUBMISSION OR PLAGIARISM IS ALLOWED.**

Network Administration Part 1

1. 1+1=1! (20%)

(a) (5%) We have learned Link Aggregation in class, which aggregates multiple physical interfaces and creates a logical interface. What are the advantages of Link Aggregation? (Please name at least two.)

(b) (15%) Cisco provides a method to do link aggregation, which is called port channel. Please continue with the in-class lab, add another physical link between Switch0 and Switch1 and build a port channel like the figure below. Save your work to **[studentID]_NA/[studentID]_Q1.pkt**.



2. CISCO Packet Tracer (15%)

Download hw3.pka and complete the following tasks on Switch0: (Points for each question will show up in the pka result.)

- Set the hostname of the switch to ”CiscoLab”.
- Disable domain name lookup in CLI.
- Set enable password to ”CISCO” and encrypt it.
- Create VLANs 10, 20, 99.
- Assign PC0 and PC1 to VLAN 10 and assign PC2 and PC3 to VLAN 20 so that PCs in different VLANs cannot ping each other.
- Assign Admin to VLAN99 and Admin should be able to access the switch by telneting `192.168.99.1`.
- Set the telnet login password to ”cisco” on VTY 0 to 4.

Use ”Check results” on the ”PT Activity” window to check your points, and save your work to **[studentID]_NA/[studentID]_Q2.pka**.

3. CSIE Crime Tracer (15%)

Suppose you are the manager of Cisco switches in CSIE whose network consists of a core switch and a number of edge switches, forming a tree topology. One day you receive a report from NTUCC that there were some suspicious packets from IP `140.112.29.197/24`, and you are responsible for finding the source of this issue.

Describe the necessary steps to trace the location of the end user (the port they use on the edge switch) and the commands used during the process. Assume the gateway of `140.112.29.197` is `140.112.29.254`, which is the core switch, and please propose the solution with as less effort as possible.

Network Administration Part 2

Set up and configure a pfsense machine with 3 vlans: 5, 8, 99. Then,

1. (10%) Run DHCP server in all vlans with pfsense as their gateway. It should also provide IP address of DNS server in vlan5 and vlan8.
2. (10%) Only machines in vlan 99 can access management interface of pfsense. Machines in vlan 99 can ONLY access to linux13(ssh) and pfsense (ssh and https but not http).
3. (10%) DNS should be available to machines in vlan 5 and vlan 8, but should NOT be available to machines in vlan 99.
4. (10%) Machines in vlan 5 can NOT create connections to machines in vlan 8, but the opposite direction is allowed.
5. (10%) IP addresses will NOT be modified in connections between vlan 5 and vlan 8.

Show your work by demo.

Note: In subtask 2, self-signed certificate error is acceptable. But it's not a good practice in real environment.