Computer Networks

Fall 2024

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Assignment 01

Due: **2024/10/31 11:59**

General policy:

- No delay unless you have good reasons to explain.
- The report must be converted into .PDF file (Don't use Microsoft Docx or other formats)
- Please pack all your submissions in one zip file with name "COMNET2024-HW1-StudentID", upload to Ecourse2
- Copy and paste from others **are not allowed**. If you have extensive resources to refer, please cite the source. I highly recommend the answer/code in your own words (English).
- I can randomly pick someone in our class to demonstrate the homework results and answer questions. The demonstration will get additional 10-20 points (if it works).
- If there is any question on the homework, you can email TA.

1. Create an Internet network

In our class and shared videos, we have learned about how to create a simple network with Web/DNS/FTP service or an Internet network to connect two different local networks. In this assignment, you use Packet Tracer to create an Internet network with the following requirements:

1. Create a local network for National Chung Cheng University with a public IP 140.123.0.0/16
   - CCU has a webserver with ccu.edu.tw domain and IP 140.123.0.2
   - CCU has an FTP server to allow students to download software (create a file name software.txt and an account with username/password as student/student for testing)
2. Create a local network for National Yang Ming Chiao Tung University with a public IP 142.121.0.0/16
   - NYCU has a webserver with nchu.edu.tw domain and IP 142.121.0.3
3. Create a local network for National Taiwan University with a public IP 172.217.0.0/16
   - NTU has a webserver with ntu.edu.tw domain and IP 172.217.1.2

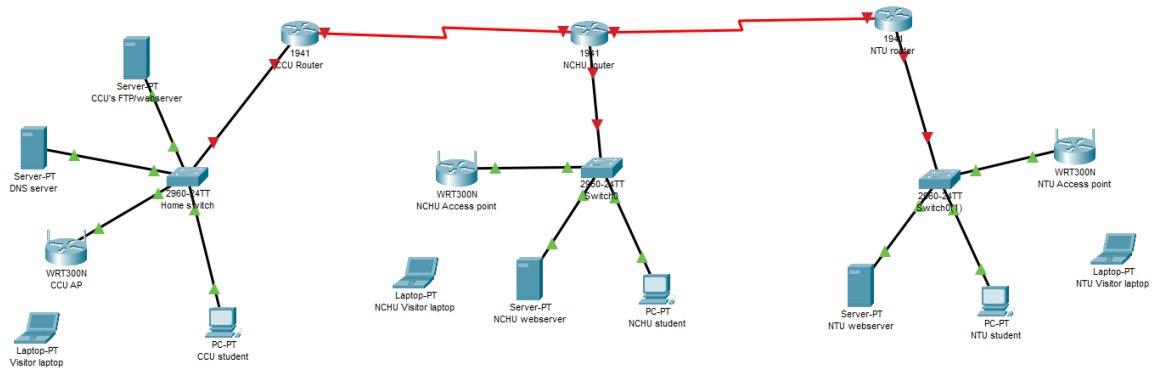
In each network, please create at least **one PC**, **one Wireless AP**, and **one laptop** with wireless card for testing

Connect three networks together and we must be able to do the following tests:

1. From any PC in any network can use domain name to access the universities' website (30pts)
2. From any PC in any network can use FTP to download software.txt file with the account student/student (20pts)
3. In the CCU network, please create four subnets with IP 142.123.1.0/24. The PCs in the different subnets cannot access each other but can access the Internet (other universities' website) (10pts)

Expected Output: You can complete all the above requirements and save the network into a Packet Tracer file *Hw1-Internet.pkt*

Hint 1: The sample architecture (not include the part of building subnets in the CCU network)



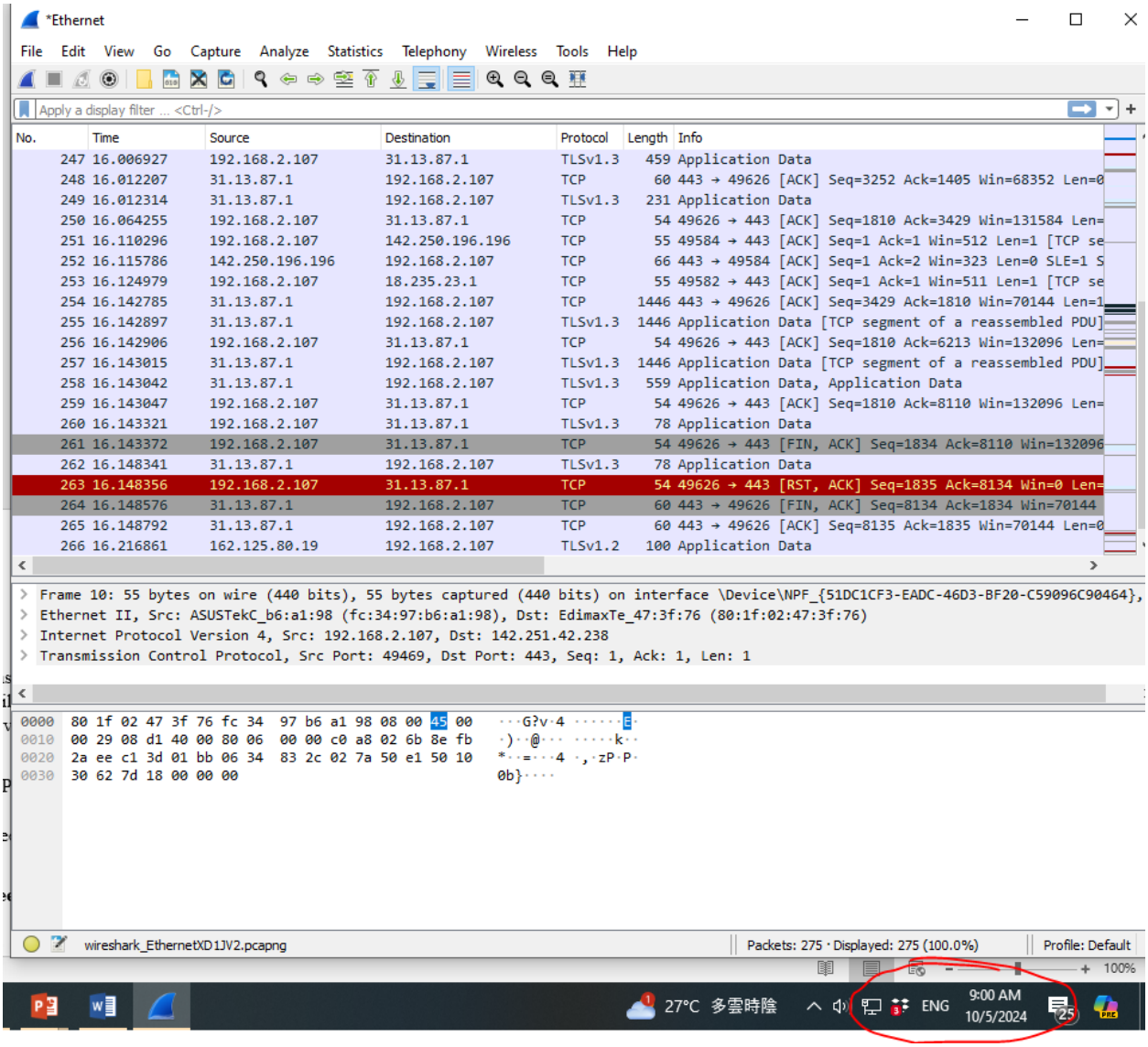
Hint 2: The network IP between two point-to-point routers should be different from their connected networks. For example, the network IP and IP for serial port of CCU router, NCHU router should be different from: (1) CCU network IP (140.123.0.0); (2) NYCU network IP (142.121.0.0); (3) the network IP between NYCU router and NTU router.

2. Traffic Analysis

In our lessons (e.g., Lesson 4), I have introduced that we can use Wireshark to analyze the traffic. In this assignment, please access the website https://www.ccu.edu.tw and use Wireshark to collect the following information

- ✓ The full TCP stream statistic and total data in bytes for the access session (10pts)
- ✓ The IP address of the website (DNS resolution) (10pts)

Expected Output: a report file Hw1-report.pdf *(create a docx file and save as PDF to submit)* **with detail descriptions of how you find out the information and screenshots with window time at the bottom right of your PC.**



3. Fix the network problem

In our lessons, I have mentioned several problems (wrong IP network configuration, wrong interface setting...) that can cause our network fails to connect to the Internet or a PC fails to ping the others. In this assignment, please use the provided Packet Tracer file (*Lab4-Network-Error.pkt*) to answer the following questions

- What are the reasons of when PC1 pings PC2 in the provided pkt, it shows "Request time out"? (10pts)
- How to fix the above problem? Show screenshots to proof how you fix to let PC1 ping PC2 successfully (10pts)

Expected Output: Please append your list/screenshots to the report file in the question 2 above.