CS 4390/5390: Computer Networks

Project 2

(This is a group assignment)

Total Points: 100

**Goal:** To make us familiar with (a) TCP, (b) Ethernet and ARP, (c) Wireshark tool, and (d) OAUTH protocol for security.

**Motivation**: So far in this course we have been gaining some technical background of computer networking. We have been mainly following the textbook. Now it is time for you to take the next step to verify things hands-on by doing project 2. You may do this with 2-3 other students as a group. If you prefer to work alone, that is also ok.

**Class Presentation** (10 points): In addition to submitting your technical work, your group also needs to present a summary of your findings to the class. In particular, on the final exam day (whereas the due date of the project submission is 11:59 pm of April 25), your group needs to do a 5-minute presentation (using ppt or so). Your group does not need to present the whole project. Your group can focus only on one task, which we will collectively decide in class on April 20. If you are a CS 5390 student, then you also need to submit a two-page (1000 words) writeup for the project, highlighting major findings, weaknesses, and suggestions for improvement.

**Task 1**. (**30 points**) Verifying fundamentals of TCP protocol with Wireshark.

The task with details is attached, which is adopted from the textbook resource. However, you have to generate the packet trace yourself. Furthermore, note that instead of working with original alice.txt file (<http://gaia.cs.umass.edu/wireshark-labs/alice.txt> which is referred in the task) you will first append your group members’ names 10 times at the beginning of the original alice.txt (after you download it), and then you will do the whole task with this modified alice.txt file.

The point distribution is as follows.

1. Submit your self-generated packet trace, which has to match with your work. Note that if your work does not match with the submitted trace, then you lose 15 points.
2. Correctness and completeness of your work. 15 points. You need to submit screenshots to show that you were able to complete each step.
3. Make a video recording of your work in which you demo the major items of the task. 10 points. The audio and video quality of the recording should be clearly understandable. Length of the recording should be about 3 mins.
4. Your answering of questions on your work on the final exam day. 5 points. Every member of your group has to participate.

**Task 2**. (**30 points**) Ethernet and ARP exploration with Wireshark. The task with details is attached, which is adopted from the textbook resource. However, you have to generate the packet trace yourself.

The point distribution is as follows.

1. Submit your self-generated packet trace, which has to match with your work. Note that if your work does not match with the submitted trace, then you lose 15 points.
2. Correctness and completeness of your work. 15 points. You need to submit screenshots to show that you were able to complete each step.
3. Make a video recording of your work in which you demo the major items of the task. 10 points. The audio and video quality of the recording should be clearly understandable. Length of the recording should be about 3 mins.
4. Your answering of questions on your work on the final exam day. 5 points. Every member of your group has to participate.

**Task 3**. (**30 points**) Sending Email with OAuth2 and Gmail in Python.

You might remember that in Project 1 we learned how to write a python program to send email via Gmail service but that was an insecure process. Now we would use OAUTH to make things secure. The CS department admin Lisa Weihl (lweihl@bgsu.edu) has written a step-by-step guideline for you, which is attached. I think Lisa would be happy to help you more if you get stuck at some step. However, cc me (sanroy@bgsu.edu) when you contact her to avoid confusion.

The point distribution of Task 3 is as follows.

1. Correctness and completeness of your work. 15 points.

Note that there are two steps as Lisa’s document describes: Step 1 (in which you get your Gmail account ready for OAUTH) carries 8 points whereas Step 2 (in which you complete the given python program to send an email via Gmail API) carries 7 points. You need to submit screenshots to show that you were able to complete each step.

1. Make a video recording of your work in which you demo the major steps of the task. 10 points. The audio and video quality of the recording should be clearly understandable. Length of the recording should be about 3 mins.
2. Your answering of questions on your work on the final exam day. 5 points. Every member of your group has to participate.

*To-submit*: Only one copy from each group needs to be submitted. Put all files (answer documents, screenshots, video recordings) in a zip and submit. If the video recordings are too big, then upload them to OneDrive and include the link in Canvas submission.