**[CIIC4070 / ICOM5026] Computer Networks**

**Project 1 – DNS and Basic Tools**

**Overview**

* This project is an **individual** project.
* In this project, you will need to learn DNS by yourself.
* In this project, you will also learn how to use two software: Wireshark and OBS (see details below).
* In this project, you must submit a report (in pdf format) in Moodle.
* All text in the report must be searchable for Moodle **to detect plagiarism**.

**Required Steps**

1. Learn DNS and find answers for the following questions:
   1. What is the full term of DNS?
   2. Which organization or organizations specify the standards for DNS?
   3. What are the main standards for DNS?
   4. What is the computing model for DNS service?
   5. What is the basic procedure of DNS?
   6. What is the scale of the network for DNS servers?
   7. What is the structure of the network for DNS servers?
   8. In a DNS response, it is possible to have multiple answers. What are the reasons for multiple answers?
2. Analyze the layers for the basic DNS service based on the **five-layer model** introduced in class, and find answers for the following questions:
   1. What are the protocols in each layer?
   2. What are the IDs in each layer?
3. Wireshark exercise
   1. Download the latest version from site: <https://www.wireshark.org/>
   2. Install Wireshark in your PC
   3. Start capturing packets using Wireshark
   4. In a browser, visit **a website (any website you want)**
   5. Stop capturing packets
   6. Use filter to quickly find two DNS packets:
      1. Query for the website from your PC
      2. Answer from a DNS server
4. OBS exercise
   1. Download the latest version from site: <https://obsproject.com/>
   2. Install OBS in your PC
   3. Use OBS to record screen and your explanation for all steps in the Wireshark exercise
   4. Upload a video to YouTube using your upr account
      1. Set its access to private
      2. Share it to me: [kejie.lu@upr.edu](mailto:kejie.lu@upr.edu)
   5. **Include the link of your video in the reference of the report**
5. Write and submit a report (See more instructions below)

**Content in the report**

* Cover page with the following information:
  + Logo of UPRM
  + Title
  + Course
  + Name of student with Student IDs
  + Name of Professor
  + Department
* Table of content
* Section 1: Introduction
  + Overview of the project
  + Outline of the rest of this report
* Section 2: Basics of DNS
  + Answers for **all 8 questions in Step 1**
  + Use **figures** to illustrate the DNS procedure and the network of DNS servers.
* Section 3: Layered Model Analysis for DNS
  + Based on the website you visited in the Wireshark exercise, answer questions in Step 2.
  + Use **a table** to summarize the protocol and entity ID for each layer
  + Use **screenshots** to:
    1. Show the website URL in the DNS packet
    2. Show the IP address you find from the DNS answer
* Section 4: More exercises about DNS and Wireshark
  + Visit the following websites in your browser and use Wireshark to capture the DNS answers
    1. www.uprm.edu
    2. www.upr.edu
    3. www.google.com
    4. www.amazon.com
    5. www.facebook.com
    6. www.netflix.com
    7. www.etsi.org
  + For each website, find the first IP address in the DNS answer, then
    1. Find the physical location of the IP address (e.g., 136.145.x.x is located in Puerto Rico)
       1. There are many IP location tools
    2. Find the owner of the IP address (e.g., 136.145.x.x is owned by the UPR system)
  + Use **a table** to summarize the website, IP address, location of IP address, owner of the IP address.
* Section 5: Conclusions
* References
  + Need **at least 10 references** (**IEEE style**) for software used, standards, research papers, **link to your video**, etc.