

CSci4211: Introduction to Computer Networks

Programming Assignment IV: It's a LAN Party

Due Date: Friday December 6, 2013 at 11:59p.m.

November 23, 2013

1 Your Task

In this assignment, you will write a simple switch which interacts with devices on layer 2 and uses a switch learning algorithm.

1.1 The Router

This time we will use a test program (TestCase.class) to judge your switch's performance. You need to run TestCase.class first, and it will establish a socket on port 5001.

```
java TestCase
```

The test program has only one set of test data. When you are submitting your final version, you need to ensure your program works well with it.

You will need to write a program (your "Switch"). It should contain one socket, which connects to the test program on port 5001.

- Five seconds after the connection is established, the test program will send strings to you, one at each time.
- The initial switch table should be empty. You need to mimic switch self-learning algorithm. We will show you an example.
- Each string is of the format: **Interface SrcMAC DstMAC**.
- An example of this string "0 1A-2B-3C-4D-5E-6F 11-22-33-44-55-66", which means that a frame arrives at Interface 0, with source MAC address 1A-2B-3C-4D-5E-6F, and destination MAC address 11-22-33-44-55-66.
- Then you need to decide what to do with this frame. For example, first, you need to check if you have known that 1A-2B-3C-4D-5E-6F resides in Interface 0. If not, add it to your switch table.
- Then you need to check if 11-22-33-44-55-66 has an entry in your switch table. If not, broadcast this MAC. In this case, you need to send a string "BROADCAST" to the test program.
- If 11-22-33-44-55-66 has the same interface with the source MAC address, you should ignore this frame. In this case, you need to send a string "IGNORE" to the test program.
- If 11-22-33-44-55-66 has the different interface with the source MAC address, you should send the interface back to the program.
- This process will last some rounds. The number is not fixed.
- When you receive a string "END" from the test server, your program can exit now. At the meantime, the test program will show how many frames you forwarded correctly, and how many frames you forwarded incorrectly.

2 What to Submit

Using moodle submission site, your submission (in a tar or zip format) should include the following:

- The router source code (in one of the languages: Python, Java).
- A session (using “script” or any other programs), or a snapshot, showing your running result.
- A brief readme.txt (less than 200 words) stating any compilation script you used, the machine you tested your program on, and any details that we should be aware of in order to compile and run your program.

This should also include two or more paragraphs explaining what each segment of the code does. This is not a line-by-line comments, but rather the logic of the code and what each segment does.

3 Tips

- Start early to avoid last-minute issues.
- Refer to the google group for any questions and answers regarding the assignment.
- Do not try to learn a new language, utilize knowledge of languages you are familiar with.
- Save and compile your work frequently.
- Try to make your program simple, commented and easy to read.