CS5248: Systems Support for Continuous Media
Spring 2009
Project Assignment

Due: Report Draft – 6 Apr 2009 (11:59:59 pm)
Due: Code – 12 Apr 2009 (11:59:59 pm)
Due: Presentation & Final Report – 13 Apr 2009 (in class)

THIS IS AN INDIVIDUAL or TEAM-OF-2 HOMEWORK

REMEMBER TO CHECK FOR ANNOUNCEMENTS ON THE CLASS WEB SITE:
http://www.comp.nus.edu.sg/~cs5248.html

Homework Description

In this project, your task is to write a packetization routine that takes in an MP3 audio file and produces RTP packets from the file, following the standard and recommendations in RFC3119.

Your implementation will be added to the Yima Personal Edition streaming media server code. You will be given the source code of Yima PE. You then implement your packetization routines within this framework. In addition to RFC 3119 you will need to implement an earlier RFC 2250 for comparison purposes. Your code should also be able to simulate packet losses, so that improved streaming quality with RFC 3119 can be demonstrated.

Reference Information and Software Version

All the students talking this module have an account on cervino.ddns.comp.nus.edu.sg. The machine is running Red Hat Enterprise Edition Linux RHEL 4.6. The necessary X11 libraries for Yima PE are already installed on this machine.

Make sure that you include the following statement in your .bash_profile file in your home directory (modify it if necessary):

```
LD_LIBRARY_PATH=$HOME/YimaPE_v1.0/Server/qpthread-1.3.1
export LD_LIBRARY_PATH
```

Additional information and links:

- Yima PE documentation: get it from the course web site (here)
- Yima PE source code tarball (YimaPE_All_v1.0c.tar.gz): get it from the IVLE workbin
- XForms web site: XForms 1.0.90
- Slides: get them from the course web site (Powerpoint)

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Submission Guidelines

1. Materials which you need to submit

   (1) Your modified Yima PE source code. Create a tarball of all your **sources** (please exclude sample audios, object files etc.).

   (2) A detailed README.txt file, that should include the following information:
     a) Your name(s), matriculation number(s), and your username(s) on the host cervino.
     b) A brief description of each of the modified/new files and how it works.

   Please create a tarball that collects all your files into a package with your matriculation number. Then compress it (with gzip) before you submit the file. **Make sure that your code compiles without ANY errors!**

   (3) A project report. Your write-up should be similar to a standard research paper (see details below). Please submit a PDF file.

   (4) Submit to your report and compressed package into the course module's IVLE workbin to the folder called 'Student Submission' by 23:59 on 06/04/09 (report) and 23:59 on 12/04/09 (source code).

   (5) Late submission policy for report.
     • late within 24 hours: 30% reduction in marks;
     • late within 3 days: 50% reduction in marks;
     • late within a week: 70% reduction in marks;
     • after one week: zero mark.
     Note that the project demonstrations will be held on 13 April and cannot be done later.

Grading Policy (35 full marks)

1. **Project Demonstration (15 marks)**. You will present your project in class on 13 April 2009. You will have approximately 20 minutes to demo your project, explain how it works and show how your RFC 3119 compliant MP3 packetization improves over the standard RFC 2250 packetization. You should be able to demonstrate the following:
   • Switch between RFC 3119 and 2250-style packetization.
   • Simulate (i.e., "turn on") packet losses in the network. The amount of losses should be selectable, for example 3%. Packet losses can be simulated on the server-side by selectively (i.e., randomly) dropping outgoing packets.
   For the demo, make sure you are ready and everything works. We will not have time to debug any issues.

2. **Project Source Code (5 marks)**. I will have a look at your code. Criteria are for example, how well it is documented, how well it is understandable, how robust it is (i.e.,

can it process all relevant input files).

3. **Project Report (15 marks)**. Your write-up should be similar to a standard research paper. Please include (at least) the following sections:
    a) Abstract
    b) Introduction and motivation
    c) Approach (your design and how you implemented it)
    d) Results (for example, show with some graphs or tables how your approach improves the streaming quality)
    e) Conclusions
    f) References

   Most of the marks will be given for sections c) and d).

Additional Notes

No plagiarism is tolerated. While you can talk to other teams and you are encouraged to used the IVLE Forum, you cannot copy source code and/or report text. If you are not sure whether something is permissible, either talk to the instructor or consult the university policy at http://www.scholars.nus.edu.sg/uspinfo/academiccode.html.