Assignment Three

System Implementation

Set: *3rd of January 2011*
Due: *14th of January 2011 @ 23:55 CEST*

Synopsis:
Implement and test a versioning file system based on FUSE.

Introduction

This is the third of three assignments in the *Principles of Computer System Design* course. In this assignment you must extend your previous article to describes the implementation and evaluation of your versioning file system. You should attempt to use the design and research from your previous assignments as much as possible. You must edit your abstract, introduction, conclusion and other relevant parts to match the new contents.

Besides describing the implementation, you must also provide an actual implementation. For the implementation, you can use any commonly available programming language, eg.: Python, Java, C++, C#, etc. You get a lot for free if the programming language has a working FUSE binding. You must also provide at least one experiment where you force the file system to produce more than one version of a document.

Background

Softhelpers have been so satisfied with your design proposal that they have extended your employment to perform the implementation of their new versioning file system. Unfortunately, the last paper was rejected by the conference committee and they have requested that you provide a prototype implementation along with some experiments to demonstrate the viability of your ideas. As this new paper will be re-submitted to the conference, it must remain in the same ACM format used in previous assignments.

The paper that you are going to re-submit should be detailed enough to allow other implementers to implement a similar system. Any readers of the paper should also be able to evaluate the complexity and any possible drawbacks and benefits your system may have. Additionally Softhelpers has asked you to ensure that you provide a working prototype implementation that they can pass on to their development team. The development team will then clean up the prototype and turn it into a finished product, complete with a shiny GUI.

Finally, Softhelpers would like to know if you have, while implementing your prototype, discovered any problems that should be remedied before they start work on the real implementation. They have told you that they would

like to hear about anything which would impact the final implementation, e.g, your choice of implementation language may have turned out not to be ideal, your method for generating new versions could be suboptimal, or your storage format may have been to cumbersome.

Your Report

Your reports should contain:

- An abstract, summarising the article
- An introduction to the research presented in the article
- The design description from assignment 2
- An implementation description of a versioning file system
- An explanation of the tests you have used and their outcome
- A description of any major problems with your prototype
- References to relevant articles
- A conclusion summarising the implementation
- A bibliography

ACM template

The Absalon course page for *Principles of Computer System Design* has an ACM article template available for download. You are encouraged to use LaTeX to write your article, however, if you choose to use a word processor you should download the Word template directly from the ACM.

More papers

You may find that your previous report already contains all the relevant articles needed to support your choices. If not, feel free to include any further articles that you find relevant. You can peruse the article reports from *Assignment One* on Absalon for further inspiration or refer to *Assignment One* for links to search engines where you may find more relevant articles.

Deliverables for This Assignment

You should submit the following items:

- A single PDF file in ACM article format, A4 size, no more than 3 pages, including references.
- The code that makes up the implementation (.zip, .tar.bz2, .tar.gz are accepted).

Handing In Your Assignment

You will be handing this assignment in using Absalon. Try not to hand in your files at the very last minute, in case a solar flare disrupts the Internets at the exact moment you are trying to submit. **Do not email us your assignments unless we expressly ask you to do so**

General Notes

- Your report and referenced articles must be written in English
- You must use the supplied ACM LaTeX or Word template
- Submit your documents as PDFs. No Word, OpenOffice, LaTeX, or PS files
- Submit your code as a single compressed archive[1] (.zip, .tar.bz2, .tar.gz are accepted)
- Absalon allows you to attach any number of files to your submission. Please **do not** compress your PDFs into a single ZIP file

Assessment

You will receive a ether a "pass" or a "fail" for this assignment along with a critique of your work to help you in the next assignment. You are encouraged to use the available 'writing workshops' to ensure that you produce a report of adequate quality. **The assessment of this assignment is based on the text, not the code**.

To pass the course, you must pass all three assignments as well as the exam. The final grade for the course is based solely on the exam.

[1] unless it is only one file in which case you just submit that, uncompressed.