SWM49: Distributed Systems Principles

Post Coursework

The assessment of SWM49 comprises the research element and practical work. The first part is a research exercise, in which you are required to investigate a certain problem pertinent to Distributed Operating Systems. The practical work is based around a design and implementation of some aspects of a Distributed System.

WEIGHTING

PART I (Research element): 50%
PART II (Practical work):50%

PART I (*Research element*)

You are required to investigate an issue that is related to Distributed Systems. The problem that you plan to address must be recognised by the Distributed Systems community, and therefore academic papers should exist that deal with that problem. You will investigate this issue through analysis of published papers in that particular area. You may choose papers from any publications, of conference proceedings. How you find your papers is not important (you may download them from the Web, photocopy, or something else). You are not allowed to use text that you can download which was not published in a magazine, journal or conference. Also, notice that textbooks are not acceptable as the sources of information.

DELIVERABLE

You will submit the result of your research in the form of an essay, which contain 2000 words (+ or – 1000).

GRADING CRITERIA

A pass (Grade C) be given to work that

Is written using word-processing software.
Addresses a topic that is relevant to the module.
Based on at least one academic paper.
Contains a reference list with references adequately cited.

A pass (Grade B) shall be given to work that

Satisfies all requirements for the lower grade.
Is well structured and organised.
Shows good understandings of issues.
Is written in a way that is easy to read and understand.
Based on more than a single paper.
Doesn't have grammatical and spelling mistakes.
Has good reference list and uses adequate citation practice.
Doesn't refer to textbooks.

A distinction (Grade A) shall be given to work that

- Satisfies all requirements for the lower grade.
- Shows deep understanding of distributed systems.
- Critically evaluates the solutions provided.

- Uses its own diagrams and pictures.
- Assess the wide implications that the research may have on both research community and the society as such.
- Puts the research topic and its solutions in the context of past, current, and future relevant technologies.
- Uses excellent citation practice.

PART II (Practical *work*)

For this part students are allowed to form groups containing not more than three members.

Your task is to investigate the possibility of creating a layer of software, which would run on the top of existing Operating Systems in a distributed nature. You are expected to design one such a system and to implement some functionality of it. Your design should be oriented towards multiple processes running and communicating in that environment. There is no special requirement what processes should do, but it is expected that they run in indefinite loop. The system should be able to provide for some the following:

- To recognise how many processes are running,.
- To establish that some of the processes crashed and to re-establish the group.
- To choose a coordinator if one dies.
- To implement a distributed mutual exclusion mechanism.
- To accept a new process in the group if one is started from a command line by a user.
- To provide a web interface so that a user may get some statistics about the system.
- To provide for anything else that you may wish to add which is relevant to the system.

DELIVERABLES

1. A detailed design of the distributed systems in terms of its modules and functionality.
2. A program code (electronic version) that is the implementation of some functionality.
3. A documentation for your work.

GRADING CRITERIA

A pass (Grade C) shall be given to work that

- Contains adequate design of the system.
- Some functionality is partially implemented and documented

A pass (Grade B) shall be given to work that

- Satisfies all requirements for the lower grade.
- Has good design and the functionality is well identified.
- Implements distributed functionality that can be demonstrated.
- Submitted documentation is of good quality.

A distinction (Grade A) shall be given to work that

- Satisfies all requirements for the lower grade.
- Presents detailed design demonstrating excellent designing skills.
- Implements the system that gives transparent view to users.
- Suggests the whole range of functions that your system may be enhanced with.
- Produced documentation of excellent quality

SUBMISSION DEADLINE: Wednesday 2nd February 2011 8AM