Module II.3502

Distributed and parallel architectures

Person in charge: Sylvain Lefebvre
Prerequisite: --
Organization: 14 x 3h Lectures/ Presentations
Evaluation: Exam, Presentation
ECTS: 5 credits

Context

Modern software systems and services must now be integrated in increasingly distributed and parallel environments.

This evolution stems from several factors. Firstly, current processors are parallel by default (multi core). Secondly, numerous high margin services rely on processing large amounts of data in parallel, thus needing distribution of computations on several systems.

Moreover, distributed systems provide increased performance and availability in the face of unreliable network or large number of users.

Objectives

This module exposes the design principles and specific constraints of distributed software systems.

Skills

In terms of skills, this module aims to enable students to:

- Design a complex system under constraints
- Assess the design and performance of a system
- Assess the reliability of a system / design

Knowledge

This module enables students to develop the following concepts and skills.

- **Concepts**
  - Distributed systems properties: consistency and availability
  - Distributed systems typology: Message queues, storage systems, distributed processing
  - Programming distributed systems

- **Know-How**
  - Assessment of availability and consistency needs
  - Distributed system design
  - RPC in python

Pedagogical Approach

Class sessions are divided in two parts: first, students will present on the previous session concepts. These presentations will be followed by either a 2 hours class or a 2 hours practical class depending on the schedule.

References

- Class corpus
- Reading lists
- Web site