Distributed Computer Systems

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

In brief

- **Ametys Code:** N8EE17A
- **Open to exchange students:** Yes

Presentation

Objectives

Current computer systems, whether embedded (avionics, automotive) or not (production systems, for example), are distributed, meaning that applications and services are implemented on a network of computers. Distributed programming can be defined as a set of communicating software entities that perform a system function.

The objective of this course is to describe and put into practice (1) the basic concepts of distributed programming according to the client-server model, as well as (2) the principles of distributed algorithms.

Description

Distributed programming is illustrated using BSD Sockets to implement client-server applications with different communication protocols, datagram (UDP) and connected (TCP). Different server models are presented, from sequential servers in datagram mode to multi-threaded servers in connected mode. The different models are implemented in a design office on a network of Linux machines.

Distributed programming is approached from the perspective of reliable message delivery to a group of processes and the issue of consensus.

A design office invites students to implement a reliable distribution mechanism and use it in a peer-to-peer application.

Pre-requisites

A good knowledge of algorithms, IP network protocols, C programming, operating system principles, and in particular Linux, is required.