

Réseaux & Services

Cloud IoT

IDENTIFICATION

CODE : TC-5-S1-EC-CIT
ECTS : 2.0

HOURS

Lectures : 0.0 h
Seminars : 0.0 h
Laboratory : 32.0 h
Project : 0.0 h
Teacher-student
contact : 32.0 h
Personal work : 0.0 h
Total : 32.0 h

ASSESSMENT METHOD

TEACHING AIDS

TEACHING LANGUAGE

English

CONTACT

M. LE MOUËL Frédéric
frederic.le-mouel@insa-lyon.fr

AIMS

The lecture technical goal is to build a Raspberry PI cluster platform, allowing to overcome Single Point of Failure (SPOF) and handle Byzantine failures. The project management goal is to organise a huge and dense project, with several sub-groups / sub-tasks, allowing to optimise resource planning and risks in human resource management.

The edge datacenter produced has to be:

- Operational
- Local, at proximity & private & reliable cloud & distributed data and software
- Efficient & IoT scalability, massive volume of devices & data & messaging

This EC is part of the teaching unit 5TC Options (TC-5-OPT) and contributes to the following skills:

A1 Analyze a real or virtual system (or problem)
A6 Communicate an analysis or a scientific approach with scenarios adapted to their specialty
C7 Design, implement, develop, deploy computer programs
B3 Interact with others, work in a team
C6 Design, implement, develop, deploy networks and protocols
C9 Conduct projects in the digital domain
Capacity: Take over an existing complex project
Capacity: Analyze operational constraints of a hardware platform constrained as a resource
Capacity: Set up distributed consensus policies and configurations for fault tolerance
Capacity: Set up high availability services
Capacity: Set up in agile team management with both large grain and a large team, and at the same time fine-grained in pairs
Knowledge: Boards, ARM Processors (Raspberry PI)
Knowledge: Event Brokers (MQTT)
Knowledge: High Availability Application Development Frameworks (Vert.x, Akka)
Knowledge: Deployment, Monitoring and Orchestration Platforms (Docker, Kubernetes)
Knowledge: Distributed Database (MongoDB)
Knowledge: Distributed Computing Frameworks (Spark, etc.)
Knowledge: Machine Learning Frameworks (TensorFlow, etc.)

In addition, it requires the following skills:

C3 Specify, design and model algorithms and computer programs
B2 Work, learn, evolve autonomously
A3 Implement an experimental approach
A4 Design a system that meets a set of specifications