Module IR.3505

Advanced Routing and Architectures

Person in charge: Yousra Chabchoub
Prerequisite: IR.2401 Routing and switching
Organization: 30 h Lectures; 16 h Labs
Evaluation: Written exam, labs
ECTS: 5 credits

Context

This module presents advanced concepts used in modern networks architectures. It is based on the module Routing and switching seen in the semester 4. It aims at presenting problems, technologies and major communication protocols not covered in the Cisco Networking Academy CCNA classes. This module contains both lectures and labs using real networks equipments (routers, switches...).

Objectives

This module aims at covering most of the current protocols and architectures, not studied in the previous modules that were more dedicated to local area networks and WAN access.

- **Skills**

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

- Understand the main current technologies implemented in networks, including local area networks and large interconnection networks (Internet scale)
- Design, study and understand the evolution of architectures based on these technologies.

- **Knowledge**

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

- **Concepts**
  o Architecture and engineering of core and metropolitan networks
  o Security and reliability of networks architectures

- **Know-How**

- o Choose and implement relevant advanced routing protocols, in the context of large networks, multi-areas or inter-AS (autonomous system)
- o Design and deploy core networks architectures, based on advanced protocols such as MPLS
- o Ensure communication reliability by using solutions like route redundancy and load balancing
- o Deploy IPv6 networks, and deal with existing networks migration
- o Protect and secure networks access using firewalls based architectures (DMZ, NAT, …)

Pedagogical Approach

This module is made of several lectures, grouped by major themes (advanced routing, advanced Ethernet, …) and labs using real network equipments. Evaluation is based on labs and written exam.

References

- Handouts
- Specialized books to be quoted by professors