

IR.2301 – Networks Fundamentals

General information

Module Title: Networks Fundamentals

Module ID: IR.2301

Module leader: Yousra CHABCHOUB

ECTS: 4

Average amount of work per student: 70 hours, including 25 hours supervised

Teamwork: yes (group projects and practical work in pairs)

Tags: OSI Template, TCP/IP, ICMP, ARP, SMTP, Addressing Plan

Presentation

This module is part of the Cisco academy at ISEP. Specifically, it deals with the "CCNA Exploration 1: Introduction to Networks" component of the academy's curriculum. It covers the fundamental notions of networks, necessary for the training of engineers in the digital field, in particular the simple architectures of networks as well as the main protocols used for the establishment of communications. Upon completion of this module, students can continue their learning and take Cisco's 200-301 CCNA certification.

Educational objectives

- Design an appropriate network architecture with the company's organization (functional constraints, geographical constraints, etc.).
- Configure network equipment: use of the Packet Tracer software.
- Master the basic commands of the Cisco operating system (IOS).
- Establish an addressing plan.
- Create and secure a small network.

Prerequisite

None

Content/Program

Concepts

- Layered OSI Model (Physical Layer, Data Link, Network, Transport, Session, Presentation, and Application)
- Protocols belonging to each layer (Ethernet, ARP, IP, TCP, UDP, ICMP, SMTP, DHCP, DNS...)
- Network devices
- Network addressing patterns (IPv4/IPv6)
- The types of media used to route data across the network
- Fundamentals of Network Security
- Communication networks and the environment

Tools used by the teacher/counsellor

This module takes place as part of a Cisco Academy, in the form of e-learning, courses and practical work. The course materials are based on the training material provided by Cisco (practical work, online courses and quizzes).

Tools used by the learner

During practical work, students use the "Wireshark" packet analyzer and the Cisco "Packet Tracer" network hardware simulator.

Pedagogical methods

Learning methods

- 50 hours of e-learning training: course support and online quizzes on Cisco's "Netacad" Networking Academy platform.
- 13 hours of lessons
- 12 hours of practical work

Evaluation methods

The evaluation of this module is based on individual and group exams and work:

- 2 Individual theory exams: 60%
- A project to be done in a group: 10%
- 6 individual online quizzes: 10%
- 3 graded practical exercises to be done in pairs: 20%

Language of work

- All materials are provided in French and English (slides, online courses, practical work, quizzes).
- Activities and assessments may be produced, at the learner's choice, in French or English.

Bibliography, Webography, Other sources

- Online course materials (Cisco Academy e-learning)
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- "The Networks" Guy Pujolle, Eyrolles, 2018