Software Networks

Academic Year: (2023 / 2024) **Review date: 30-03-2023**

Department assigned to the subject: Telematic Engineering Department

Coordinating teacher: OLIVA DELGADO, ANTONIO DE LA

Type: Electives ECTS Credits : 3.0

Year : Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Communications Networks and Services

OBJECTIVES

This course describes the principles of software networks, namely network function virtualization and software defined networking. To achieve this objective, the student must acquire specific knowledge and capacities:

- Understand the technological and market context triggering the need of network virtualization technologies.
- Know and understand the principal virtualization technologies, including virtual machines and containers.
- Understand the basics of programmable data planes.
- Know the principal architecture of network function virtualization.
- Implement, deploy and configure in the lab a realistic network service on a virtualization platform.

DESCRIPTION OF CONTENTS: PROGRAMME

The programme is divided into four parts:
FIRST PART (Introduction):
- Presentation and introduction of the course.
- Introduction to Software Networks.

SECOND PART (Virtualization):
- Introduction to virtualization.
- Hypervisors.
- Virtual machines.
- Containers.
- Hardware support to virtualization.

THIRD PART (Network Function Virtualization):
- Introduction and motivation.
- NFV architecture.
- Software architecture.

FOURTH PART (Software defined networks):
- Introduction to SDN.
- SDN architecture and OpenFlow basics.
- OpenFlow and Integration with NFV.

LEARNING ACTIVITIES AND METHODOLOGY

The teaching methodology includes:

(1) Theoretical classes. Students will be provided with the learning objectives to be covered in which lecture and the specific material to prepare it (prior to the actual class). In these classes, the concepts related to the learning objectives are revised and, with the participation of the students, the acquired knowledge will be checked and strengthened interactively (POs a, j).

(2) Laboratory classes in computer rooms, where students will configure network virtualization tools.

ASSESSMENT SYSTEM

The evaluation is 100% continuous assessment in the first evaluation, following the existing University regulation in the second evaluation.

The mark of the continuous assessment work is composed of two parts:

- Lab results (based on milestones and/or short reports, there may be additional lab tests): 60%.
- Knowledge tests (during the sessions): 40%.

% end-of-term-examination:	0
% of continuous assessment (assigments, laboratory, practicals…):	100

BASIC BIBLIOGRAPHY

- William Stallings Foundations of Modern Networking: SDN, NFV, QoE, IoT, and Cloud, Addison-Wesley Professional, 2015

ADDITIONAL BIBLIOGRAPHY

- Ken E. Gray and Thomas D. Nadeau Network Function Virtualization, Morgan Kaufmann, 2016

- Ken Gray and Tom Nadeau SDN: Software Defined Networks: An Authoritative Review of Network Programmability Technologies, O'Reilly, 2013