

IDENTIFICATION

Course code : ESI-SPI-CI-IN4-S8-UE1-EC1
ECTS : 2

DURATION

Lectures : 6
Tutorial classes : 4
Labs : 14
Total : 24

Project :
Personnal work :

ASSESSMENT

Continuous assessments.

TEACHING MATERIALS

Slides and practical work sheets.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-SYSRES

COURSE : Next-Generation Networks : Concepts and Innovations

SCOPE OF THE COURSE

OBJECTIVES

To provide a synthetic overview of the new “network virtualization” paradigm such as SDN and its extensions : SD-WAN and SASE.

COMPETENCE AND SKILLS

- Designing a multi-site connection via an operator network
- Determining the challenges and stakes of deploying applications and services

PROGRAM

- Overview of network evolution since the 2000s.
- Network virtualization : Software Defined Network (SDN).
- SDN architectures : decoupling data-plane vs control-plane, abstraction layers (Northbound and Southbound APIs), controllers.
- Coexistence of virtualized and traditional networks.
- Virtualization of network functions (virtual firewalls, load balancers, proxies...) and comparative performance.
- Virtualization of wide-area networks : SD-WAN.
- Evolution of SD-WAN toward security : Secure Access Service Edge (SASE).

BIBLIOGRAPHY

- Software Defined Networks : A Comprehensive Approach. Paul Goransson, Chuck Black, Timothy Culver. Morgan Kaufmann (2016)
- SDN : Software Defined Networks. Thomas Nadeau D., Ken Gray. O'Reilly Media (2013)
- Software-defined networking and security : from theory to practice. Chowdhary, Ankur, Huang, Dijiang, Pisharody, Sandeep. CRC Press Taylor & Francis Group (2018)
- Foundations of Modern Networking : SDN, NFV, QoE, IoT, and Cloud. Stallings, William. Addison-Wesley Professional (2015)

REQUIREMENTS

The Systems and Networks modules from previous semesters.