

# Course : Cisco multilayer switches

**Practical course - 4d - 28h00 - Ref. RCM**

**Price : 2790 CHF E.T.**

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By the end of this course, the participant will be able to implement a level 2 switched network and ensure its reliability via redundancy. He or she will also have learned how to implement the QoS needed to process VoIP, and to make the ports of a switch secure.

## Intended audience

Network technicians and administrators.

## Prerequisites

Basic knowledge of enterprise networks, and in particular IP addressing mechanisms.

## Practical details

### Hands-on work

Essential hands-on courses using 2950 switches. This course is independent of the model and iOS version.

## Course schedule

### 1 Campus networks

- Evolution of LANs.
- Bridging, routing, and switching.
- Pros and cons of different options.
- Choosing an appropriate solution.
- Organizing a network of switches.
- Topology rules.

### PARTICIPANTS

Network technicians and administrators.

### PREREQUISITES

Basic knowledge of enterprise networks, and in particular IP addressing mechanisms.

### TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

### ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.

Participants also complete a placement test before and after the course to measure the skills they've developed.

## 2 Building a campus network

- Elements of the physical layer.
- From 10MB Ethernet to Gigabit Ethernet.
- Full Duplex Ethernet.
- Principles and protocols.
- Virtual LAN: VLAN.
- VLAN design criteria (ports, addresses).
- Wide area virtual LANs. VLAN Trunking Protocol (VTP).
- Assigning mobile access. Dynamic Trunk Protocol (DTP). Cisco Discovery Protocol (CDP).
- Switch to switch linking. Inter Switch Link (ISL from Cisco) or 802.1.q (IEEE standard).
- Grouping links: Ether Channel.

### Hands-on work

Configuring a switched network. Implementing interconnected virtual LANs. VTP configuration.

## 3 Managing redundant links

- Spanning Tree Protocol (STP).
- Principles, algorithm.
- Configuring a redundant topology.
- Precautions of use.
- Impact on convergence.
- PVST+ (Per VLAN Spanning Tree), evolution of Spanning Tree.
- InterVLAN routing.
- Defining workgroups.

### Hands-on work

Redundant gigabit switch interconnections. Implementing STP. Configuring priorities, managing backups. Handling incidents based on settings.

## 4 Traffic management

- VLAN to VLAN traffic.
- Integration via a backbone.
- IP routing performance with multilevel switching.
- Managing storms and corresponding actions.
- Configuration of quality of service for data traffic and VoIP traffic.
- 802.1P service classes and their DSCP mapping.
- Marking flows, prioritization and resource reservation.
- VLAN VoIP.
- Benefits of MPLS (Multi Protocol Label Switching).
- IP Switches.

### Hands-on work

Implementing different traffics. Comparing performance.

## 5 Adding reliability

- The HSRP protocol (Hot Standby Routing Protocol).
- Implementing a reliable solution.
- Validating handovers.

### Hands-on work

Configuring a switch command cluster with HSRP transparent backup. Validating handovers. Configuring priorities and preemption.

## TEACHING AIDS AND TECHNICAL RESOURCES

- The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
- At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
- A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

## TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

## ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at [psh-accueil@orsys.fr](mailto:psh-accueil@orsys.fr) to review your request and its feasibility.

## 6 Handling multicast.

- Role and principle of multicast.
- Link level processing. Different protocols: IGMP.
- The role of the PIM protocol (ProtocolIndependent Multicast).
- PIM V1 and V2.
- Implementing the IGMP snooping function.
- Management of multicasting.

### Hands-on work

Completion and management of multicasting in a switching network.

## 7 Network access control

- Filtering mechanisms.
- Traffic filtering.
- Standard and extended lists.
- By address, port, applications, flows.
- Secure ports and associated actions.

### Hands-on work

Implementing criteriabased access protections. Filtering physical access attempts. Filtering traffic.

## Dates and locations

### REMOTE CLASS

2026: 31 Mar., 31 Mar., 9 June, 9 June, 22 Sep.,  
22 Sep., 24 Nov., 24 Nov.