orsys TRAINING

Introduction to Networks
installer et administrer des réseaux locaux

Hands-on course of 3 days - 21h
Ref.: TRM - Price 2025: 2 140 (excl. taxes)

This course, including both theoretical and hands-on exercises, will help you to understand and practice enterprise networking. Most important aspects, including software and hardware parts will be explained. Interconnection devices such as switches and routers, networking protocols such as TCP/IP, and high-level application protocols such DNS, DHCP, HTTP and others will be examined thoroughly. Following this course, you will be able to set up local area networks and to connect and manage PCs running Windows or Linux.

The exercises and demonstrations in this course are based on the end-to-end construction of a mini enterprise network based on the traditional HQ/branch model. Participants will configure and interconnect servers, workstations, and equipment as the course goes on.

THE PROGRAMME
last updated: 02/2024

1) Introduction
- What can we do with a network ?
- Which parts will constitute our network ?
- What are the typical needs of network users ?
- Architecture : communication, interconnection, administration, and security.

2) Networking technologies and general principles
- Types of network.
- Which technologies ? Characteristics of each technology.
- Client-Server communication.
- Sharing resources. What is a " protocol " ?
- Open System Interconnection Basic Reference Model : The seven layers.

3) Cabling possibilities
- Twisted pair, coaxial cable, fiber optics.
- Cabling systems : design and principles.
- Wireless networks.
- Standards.

4) Local Area Networks (LAN)
- Central role of Local Area Networks in today networking.
- The Ethernet " family ".
- CSMA/CD Medium Access Control in IEEE 802.3 networks.
- From 10 Mbps hubs to 10 Gbps switches.
- Wireless networks (802.11x).

5) Interconnection devices
- Hubs and repeaters.

- Bridges and switches. VLANs.
- Routers
- Gateways
- Firewalls
- Switched Ethernet based architecture.
- What is Spanning Tree ?
Hands-on work : Connecting workstations and servers to ethernet switches.

6) Wide Area Networks (WAN)
- When to use a WAN ? What kind of WAN can we use ?
- WAN services.
- Overview of WAN technologies and protocols (From RNIS to MPLS).
- ADSL.

7) The TCP/IP stack
- Interconnection basic needs.
- The IP protocols.
- Addresses and network masks.
- Unicats, multicast, broadcast.
- The ICMP protocol.
- Understanding the Transports protocols : TCP and UDP.
- Applications and transport port numbers.
- Client/server model.
- How to configure Windows and/or Linux.
Hands-on work : Using some Network Sniffers (Ethereal/Wireshark). Setting up addresses and masks on Windows and/or Linux. What is a MAC address. ARP protocol. Connection test (ping).

8) Routers : inter-networking principles
- Why use a router ?
- Routing and forwarding principles. Routing tables.
- Static versus dynamic routing.
- Routing protocols (RIP2, OSPF, BGP).
- IP switching.
Hands-on work : Connecting and configuring routers. Displaying and modifying routing tables. Testing the networks and routers (traceroute).

DATES

REMOTE CLASS
2025 : 23 juil., 19 nov.