

# Introduction to IPv6 deployment and migration

Hands-on course of 4 days - 28h

Ref.: PVI - Price 2024: €2 690 (excl. taxes)

## THE PROGRAMME

last updated: 01/2018

### 1) Introduction

- IPv4, a 30-year long success story.
- Problems with IPv4.
- Routing table explosion and addressing space exhaustion.
- Real-time traffic and QoS handling. Efficiency.
- Using CIDR and NAT.
- Using DSCP.

### 2) IPv6 overview

- IPv4 and IPv6 packet header formats.
- IPv6 extension headers instead of IPv4 options.
- TCP, UDP, and ICMP using IPv6 : what's new ?

### 3) Addressing scheme

- 128-bit long addresses : address types, address representation, address lifetime.
- Addresses scopes.
- Link local and Global addresses.
- Multicast and Anycast addresses.
- Address allocation, IANA/ICANN, and RIR.

*Hands-on work* : Activating IPv6 on a Windows computer. Automatic and manual address configuration. Link local and global addresses. The IPv6 "ping" command.

### 4) Automatic configuration

- New protocols : ICMPv6 and DHCPv6.
- The enhanced role of the local router.
- Neighbor Discovery Protocol and the RS, RA, NS and NA ICMPv6 messages.
- Redirect ICMPv6 message.
- Stateless and statefull automatic configuration.
- Phases during automatic stateless configuration.
- Building a globally unique address .

*Hands-on work* : Configuring routers and servers. Manual and/or automatic workstations configuration.

### 5) Applications using IPv6

- IPv6 compatible DNS.
- IPv6 transport, AAAA records.
- Reverse address resolution. DNS clients.
- IPv6 software compatibility. Native compatibility. Network API translation.
- Upper layer protocols : Telnet, SSH, TFTP, SNMP, FTP, HTTP.

*Hands-on work* : Registering IPv6 addresses within a DNS server. Testing DNS servers and clients for IPv6 address resolution. Using IPv4 and IPv6 applications

#### 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.

#### 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 to review your request and its feasibility.

## 6) IPv6 routing

- Static routing vs. dynamic routing.
- RIPng protocol.
- OSPFv3 protocol.
- EIGRP protocol and IPv6.
- MBGP and IPv6.

*Hands-on work* : IPv6 static routing. IPv6 dynamic routing with RIPng, OSPFv3, MBGP.

## 7) Mobile and Security with IPv6

- From mobile IPv4 to mobile IPv6.
- Using bidirectional tunnels. Direct routing.
- IPSec protocol.
- Host authentication with AH. Privacy with ESP
- Establishing dynamic security association with IKE and ISAKMP.
- Internet Security Association Key Management Protocol.

*Hands-on work* : Transport mode IPsec between hosts. IPsec tunnels between routers.

## 8) Migrating from IPv4 to IPv6

- Going from IPv4 to IPv6.
- Using both IPv4 and IPv6 protocols.
- Transition mechanisms. Dual stack, Protocol translation, Tunneling.
- Best common practices.

# DATES

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## REMOTE CLASS

2024 : 03 Sep, 12 Nov