IPv6 Hands-on («IPH»)

During three days you will learn about the innovations and opportunities of IPv6 and receive the necessary basis to be able to strategically use and integrate the new technology.

Duration: 3 days
Price: 2'850.–

Content

Introduction

- Brief historical overview
- Why IPv6?

The structure of the protocol

- General IPv6 header structure
- Comparison with IPv4 headers
- The individual fields in the IPv6 header
- Extension header architecture and its meaning
- The Extension Headers defined today and their use

Mobile IPv6

- Brief overview of the meaning of this specification
- Comparison with Mobile IPv4
- Route Optimisation: Example for the use of Extension Headers

IPv6 Addressing

- The current status of the IPv4 address space
- Decrease of the IANA pool, Internet growth rate
- The current status of the IPv6 address pool; how manyE addresses are there really?
- IPv6 allocations globally (who already has prefixes and which ones are already active?)
- The address architecture
- Address types (unicast, anycast, multicast)
- Format and notation of IPv6 addresses
- EUI-64 address generation (Interface Identifier)
- Officially defined prefixes
- Special address types

ICMPv6

- Overview of ICMPv6 and comparison with ICMPv4
- ICMPv6-based functions in IPv6
- IMCPv6 - new message types
- Neighbour Discovery (ND)
- Duplicate Address Detection (DAD)
- Stateless Autoconfiguration (SLAAC)
- Neighbor Unreachability Detection (NUD)
- Path MTU Discovery (PMTDU)
- Multicast Listener Discovery (MLD)

Transition Mechanisms

- Overview of the techniques (Dual-stack, Tunneling, Translation)
- Dual Stack
- Tunneling overview, general mechanisms
- 6to4
- Isatap
- Teredo
- Tunnel Broker
- Softwire Mesh Framework
- MPLS (6PE, 6VPE)
- 6RD
- Carrier Grade NAT (CGN, LSN)
- DS-Lite
- NAT-PT
- NAT64/DNS64
- XLAT

DNS

- New DNS Record Types
- DNS - Dual-stack Issues
- Default Address Selection
- DNS Communication

DHCPv6

- General Overview of the Specification
- New Message Types and Functions
- Overview of implementations
- Stateless DHCPv6
- Multicast addresses and port numbers
- Headers and options
- Relaying
- Overview of message types
- Header format
- Relay message format
- Client communication
- Relay Communication
- DHCPv6 Security Issues

Routing Protocols

- Overview
- Configuration RIP, OSPF
- Configuration SLAAC (Router Advertisement)

Security and QoS

- IPSec
- IPv6 Security Elements
- Most important changes in security (enhancements)
- Enterprise security strategies
- Quality of Service
- IPv6 QoS elements
- General Security Issues in IPv6 Networks
- Local Network Protection

IPv6 Integration

- Defining an integration strategy
- Network Assessment
- Possible approaches, best practices
- Opportunities for integration with forward planning
- IPv6 address concepts
- Cost-saving opportunities
- Possible factors that trigger time pressure
- The golden rules

Key Learnings

- Know which future services will be enabled by IPv6.
- Describe the important and new functions of IPv6 from a technical point of view.
- Compare the functions of IPv6 with those of IPv4
- Describe the existing transition and coexistence mechanisms of IPv6 with IPv4
- Configure IPv6 on Windows and Linux systems and on Cisco routers.

Methodology & didactics

The course was developed by Silvia Hagen, Sunny Connection, a renowned expert and author of highly acclaimed books. Sunny Connection trainers are experienced network engineers and have been trained and certified by Silvia Hagen to deliver these courses. Thanks to hands-on exercises and practical information on migration and coexistence with IPv4, you can immediately use what you have learned in practice and plan and carry out your first test installations.

Each student has their own virtualised lab environment at their disposal. Using Wireshark trace files, you can retrace the communication.

Target audience

This workshop is aimed at technical decision-makers, IT architects, network analysts, IT consultants, system administrators, network and system engineers as well as manufacturers and application developers who want to get a sound overview of the new functionality of IPv6.

Requirements

A good understanding of networks and TCP/IP is required. No prior knowledge of IPv6 is required.

- TCP/IP Basics («TCN»)

Any questions?

We are happy to advise you on +41 44 447 21 21 or info@digicomp.ch. You can find detailed information about dates on www.digicomp.ch/courses-it-provider/network-telecom/course-ipv6-hands-on