Implementing IPv6 on Windows

(4 days)

How to plan and implement IPv6 in a Windows based commercial environment

Relevant Platforms:
- Microsoft Windows Server
- Microsoft Windows
- Including Windows 10

You will learn how to:
- Migrate your network to IPv6
- Manage the differences between IPv4 and IPv6
- Implement new networking software and devices to support IPv6
- Implement IPv6 auto-configuration and manage IPv6 addresses
- Configure IPv6 migration techniques on different platforms.
- Configure transition techniques including: dual-stack, 6to4, ISATAP and Teredo.
- Configure IPv6 enabled network services (e.g. DNS, and DHCPv6).
- IPv6 enable networking applications (e.g. IIS).

Course Benefits
IPv6 is the result of many years of research and activity by the international Internet community.
IPv6 provides increased addressing space, improved routing, new security features and support for new applications.

The implementation of IPv6 is inevitable and will impact on all companies that maintain, implement or use IP networks. Since the introduction of Windows Vista and Windows Server 2008, Microsoft operating systems have included an IPv6 stack and where possible IPv6 is used by default.

In this course, you will learn how to obtain and implement IPv6 protocols within your organisation on Active Directory networks, Windows Server 2008, Windows 7, Windows Vista and other networked devices. This course provides extensive hands-on sessions and in-depth technical analysis.

Who Should Attend
This course is ideal for network administrators, network support personnel, network designers, networking consultants, IT managers and directors.

A good knowledge of general networking concepts is assumed. Experience of IPv4 and Windows is recommended.

Course Contents
The Need for IPv6
- History of IP
- The problems with IPv4
- The IPv4 header format
- Address space & functionality
- IPv4 Security and QoS
- Reality Check: IPv6 vs IPv4

The Features of IPv6 I
- IPv6 datagram format and header
- IPv6 extension headers
- Hop-by-hop and destination options
- Routing header, fragmentation header
- Mobility header and No next header
- IPv6 addresses and address representation
- Unicast Multicast & Anycast in IPv6
- Link local, site local and unique local addresses

The Features of IPv6 II
- Summary of the new features of IPv6
- ICMPv6
- Path MTU discovery (PMTU)
- IPv6 multicast group management
- MLD and MLDv2

Auto-configuration of IPv6 I
- Autoconfiguration methods
- Choosing the interface identifier
- Modified EUI-64
- CGA, HBA, Privacy and Temporary Addresses
- Neighbour discovery in IPv6 (NDP)
- IPv6 router discovery (RS and RA)
- IPv6 Router renumbering

Auto-configuration of IPv6 II
- DHCPv6
- DHCPv6 Relay Agents
- DUIDs and IAIDS
- Stateless DHCPv6
- DHCPv6 prefix delegation (PD)

Interworking IPv6
- IPv6 routing and IPv6 routing tables
- IPv4 default routes

IPv6 Dynamic Routing
- ICMPv6 redirects
- RIPvng
- OSPFv3
- IS-IS and IPv6
- EIGRPv6
- BGP4 & IPv6
- IPv6 multicast dynamic routing
- IPv6 PIM

Interfacing IPv6 to the Lower Layers
- The Data-link layer and the physical layer
- Point to point and IPv6
- IPv6 over PPP
- NBMA networks and IPv6
- IPv6 over ATM
- EEE802 and IPv6
- IPv6 in 3GPP and IMS
- MPLS and IPv6
- 6PE and 6VPNE
- RADIUS and IPv6

The Transport Layer and IPv6
- Operation of TCP and UDP
- Changes to TCP for IPv6
- Changes to UDP for IPv6

IPv6 Transition Mechanisms I
- Overview of IPv6 transition mechanisms
- IPv6 dual stacks
- IPv4 compatibility addresses
- Automatic and configured tunnelling
- 6over4 and 6to4
- 6rd - IPv6 rapid deployment
- ISATAP
- Teredo
- Dual stack lite (DSLite)
- Dual stack transition mechanism
- IPv6 Tunnel brokers
- Tunnel setup protocol

IPv6 Transition Mechanisms II
- Protocol translators
- SIIT, NAT-PT & NAPT-PT
- Application layer gateways
- NAT64 and DNS64
- 464XLAT
- IPv6 SOCKS
- BIS and BIA
- Transition mechanisms and DNS
- ISP IPv6 Deployment Scenarios

IPv6 Security (IPsec)
- Cryptographic techniques
- IPv6 and IPsec
- IPv6 AH & ESP Headers
- Transport and tunnel modes
- Security associations
- ISAKMP & IKE

Mobile IPv6
- Mobile IPv6 vs Mobile IPv6
- Mobile IPv6 Home agents
- Binding updates & binding cache
- Mobile IPv6 in operation

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