

## **Course 750: Managing Mixed IPv4 and IPv6 Networks (4 days)**

### **Course Description...**

IPv6 is an evolutionary upgrade to the Internet Protocol. It is designed to allow the Internet to grow steadily, both in terms of the number of hosts connected and the total amount of data traffic transmitted.

There are strong indications that most, if not all, organizations will move to IPv6 in the near future. In fact, the federal government recently mandated its usage. That being said, no one is going to give up the investment in IPv4 overnight - even if it could be done. System and network administrators will be managing and living in a mixed IPv4 & IPv6 network environment for the foreseeable future. This course informs the network professional about the changes IPv6 will bring about, how to live in a mixed environment, and how to manage the transition from IPv4 to IPv6.

### **Learning Objectives...**

- IPv6 new addressing structure
- Security under IPv6
- How to setup and manage Quality of Service under IPv6
- Learn the changes to the protocol stack
- Learn the changes to the routing protocols, DNS, and DHCP
- Learn to use the transitioning methods
- Learn about the changes necessary to firewalls

### **Who should attend...**

Network administrators and senior programmers who will be transitioning to IPv6.

### **Prerequisites...**

A complete knowledge of IPv4 is mandatory to understand the changes made by IPv6. A basic understanding of TCP/IP is assumed.



## Course Outline...

### Chapter 1 - Protocol Basics

- 1.1 Addressing (unicast)
- 1.2 Datagram headers
- 1.3 Extension headers
- 1.4 ICMPv6

### Chapter 2 - Multicast Details

- 2.1 Address Format
- 2.2 Scope Definitions
- 2.3 Reserved and Permanent Addresses
- 2.4 Solicited-Node
- 2.5 Multicast Listener Discovery (MLD)

### Chapter 3 - Anycast

- 3.1 Overview and why
- 3.2 Architecture
- 3.3 Routing Issues

### Chapter 4 - Interfacing to the Lower Layers

- 4.1 Data-Link and physical layer
- 4.2 Point to point and IPv6
- 4.3 DBMA networks
- 4.4 IEEE802
- 4.5 FDDI interface
- 4.6 WAN interfaces

### Chapter 5 - IPv6 Routing

- 5.1 Routing Tables
- 5.2 MTU discovery and Fragmentation
- 5.3 Neighbor reachability
- 5.4 RIP, IGRP
- 5.5 OSPFv3 BGPv4
- 5.6 BGPv4
- 5.7 Router renumbering
- 5.8 Routing headers

### Chapter 6 - Transport Layer

- 6.1 Operation of TCP and UDP
- 6.2 Ports and Sockets
- 6.3 Changes to TCP and UDP

### Chapter 7 - Security

- 7.1 Cryptographic Primmer
- 7.2 AH and ESP headers
- 7.3 Transport and tunnel modes
- 7.4 Security associations
- 7.5 ISAKMP and IKE

### Chapter 8 - Mobile IP

- 8.1 Link Layer mobility
- 8.2 Mobile IPv4 vs. Mobile Ipv6
- 8.3 Mobile Ipv6 in operation



## **Chapter 9 - Quality of Service**

- 9.1 Traffic Class and Flow Label
- 9.2 DiffServ, IntServ and RSVP

## **Chapter 10 - Autoconfiguration**

- 10.1 DHCPv6
- 10.2 Link-Local Addresses
- 10.3 Neighbor Discovery
- 10.4 Router Discovery
- 10.5 Router Renumbering
- 10.6 Duplicate Address Detection (DAD)

## **Chapter 11 - DNS**

- 11.1 AAAA, PTR, A6 and DNANE RR
- 11.2 ip6.arpa. and ip6.int.
- 11.3 A6 chains
- 11.4 BIND and MS DNS
- 11.5 DHCP interaction

## **Chapter 12 - Application Changes**

- 12.1 Ping, telnet, FTP
- 12.2 Mail Systems
- 12.3 Web-servers (Apache)

## **Chapter 13 - Network Management**

- 13.1 SNMP
- 13.2 SNMP Security

## **Chapter 14 - IPv4 and IPv6 Together**

- 14.1 Dual stacks
- 14.2 Compatibility addresses
- 14.3 6-to-4 and 6-over-4
- 14.4 ISATAP, Teredo & DSTM
- 14.5 Tunnel brokers
- 14.6 Protocol Translators
- 14.7 BIS and BIA

## **Chapter 15 - Migrating to IPv6**

- 15.1 Transition design and planning
- 15.2 Dual-stack method
- 15.3 Tunneling method
- 15.4 6to4 and 6over4
- 15.5 Bridging between 4 and 6

*Please contact your ROI representative to discuss course tailoring!!!*