

## Course Description

IPv6 is the next generation Internet Protocol, extending network capabilities to support the strenuous demands of modern applications while creating a platform for future growth and innovation.

In this Hands-On course, you gain the knowledge and skills to design, implement, verify and troubleshoot IPv6 on networks used by carriers, enterprises and at home.

This course will include Real-World practical Hands-On labs and case studies. The aim will be to take set of working applications and migrate the environment to IPv6 to experience the problems created and implement the solutions Hands-On.

## Students Will Learn

- **Implement a successful transition to IPv6 using proven techniques**
- **Simplify network management by taking advantage of auto configuration**
- **Ensure the compliance of applications with IPv6**
- **Build tunnels and dual stacks to achieve IPv6 and IPv4 network coexistence**
- **Deploy enhanced routing protocols to simultaneously support IPv6 and IPv4**
- **Install and configure IPv6 on PCs, Servers and routers**
- **Examine headers and protocols with protocol analyzers**
- **Architect an IP addressing scheme**
- **Implement and troubleshooting auto configuration**
- **Explore IPv6-enhanced applications**
- **Configuring and verifying tunnels to establish internetwork communication**
- **Deciphering router configurations**
- **And more...**

## Target Audience

Technical personnel, planners, managers, network administrators and application developers.

## Prerequisites

Familiarity with TCP/IP and networking concepts at the level of IPv4 Fundamentals is assumed.

## Course Outline

### 1: Current IP-Based Networks

- Uncovering the successes and shortcomings of IPv4
- The business constraints of limited address space
- Prolonging IPv4 lifetime with CIDR
- Private addressing and NAT

### 2: Modernizing Networks Through IPv6

- The path to IPv6
- Emerging from the IP Next Generation Project
- Developing solutions through the IETF
- Fundamentals of IPv6
- Improvements over IPv4
- Examining IPv6 header details
- Increasing efficiency through extension headers
- Provisioning Quality of Service (QoS)

### 3: Leveraging the Address Space

- IPv6 addressing schemes
- Global Unicast
- Multicast
- Subnetting
- Link local
- Temporary
- Taking advantage of special addresses
- Finding the nearest server with Anycast
- Minimizing network traffic
- Enabling communication between IPv6 and legacy nodes
- Comparing IPv4 and IPv6 Routing Tables

### 4: Evolving Legacy Protocols and Applications

- Improving core and supporting protocols
- Updating UDP and TCP for error detection
- Comparing DHCP with auto configuration of addresses

- Analyzing enhancements to DNS records
- Configuring DNS for IPv6
- Modifying existing applications
- Deploying updated FTP
- Integrating IPv6 addresses with Telnet and SSH
- Facilitating dynamic multimedia collaboration using SIP

## **5: Migrating from IPv4 to IPv6**

- Coexisting with IPv4
- Adopting dual-stack techniques
- Mixing IPv4-only and IPv6-only nodes
- ICMP issues in hybrid environments
- Translating addresses between IP protocols
- Tunneling
- Communicating across IPv4 backbones
- Establishing links between IPv6-only islands
- Selecting optimum techniques for successful migration

## **6: Multicasting with IPv6**

- Understanding IPv4 multicasting
- Multicast Addressing with IPv4
- IGMP
- PIM
- Multicast addressing with IPv6
- Migrating to IPv6 multicast

## **7: Optimizing Routing with IPv6**

- Augmenting interior routing protocols
- Managing small network routing with RIPng
- Converting complex and robust network infrastructures to OSPFv3
- Deploying ISIS for IPv6
- Extending exterior routing protocol functionality
- Indicating BGP enhancements
- Connecting IPv6 and IPv4 autonomous systems

## **8: Maintaining IPv6 at Your Organization**

- Preparing for ubiquitous networking
- Determining ISP support for IPv6 in your organization

- Connecting to IPv6 Web servers and other services

## **Evaluation and Review**

## **Delivery Method**

Instructor-Led with numerous Hands-On labs and exercises.

## **Equipment Requirements**

**(This apply's to our hands-on courses only)**

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

## **Course Length**

3 Days