

# IP Networking

## Course Description

This seminar will cover all aspects of the future and current technologies in IP networking, including internet architecture, routing protocols, business models, IP quality of service issues, IP traffic management, and other solutions.

## Prerequisites

TCP/IP – Basic Course

**Duration:** 3 days

## Course Outline

### 1. Introduction

- IP networking: The current state
- IP networking: the new stakes
- The new IP generation: IPv6
- IP routing overview

### 2. IP and Quality of Service (QoS)

- Motivation
- The Integrated Services (Intserv) architecture.
  - o IP classes of service: Best Effort, CLS, GS
  - o Integrated Services: RSVP, RTP
- The Differentiated Services (Diffserv) architecture
  - o Diffsev Code Point (DSCP)
  - o Per Hop Behaviour (PHB)
- Intserv-Diffserv integration

### 3. MPLS and IP-VPN

- MPLS (Multi Protocol Label Switching) architecture
  - o MPLS architecture
  - o Label Distribution Protocol (LDP)
  - o MPLS QOS
  - o Traffic engineering
  - o IP VPN (RFC 2547bis)
  - o Virtual routing

- o From MPLS to GMPLS

### 4. IP Multicast

- IGMP (Ver 1,2,3)
- PIM – new routing protocol
- Switching of IP Multicast

### 5. IP Security

- New risks, new approach
- Firewalls
- IPSec
  - o Principles
  - o Security Protocols (AH,ESP)
  - o Key Management (ISAKMP)
  - o Authentication and Encryption (RSA,DES)
- Security Socket Layer (SSL)
- Secured Virtual Private Networks (VPN)

### 6. IPv6

- IPv6 Overview
- IPv6 header format
- ICMPv6
- Addressing
- Routing
- Implementation
- Migration form IPv4