

# MultiService Switching: MPLS and H.248



## Course Description

This course covers MPLS and H.248 (MEGACO). The next generation of telecommunications networks will be deployed using VoIP technology and soft switching replacing circuit switching and ISDN signaling. By deploying communications as multimedia streams over IP it is possible to extend the services from simple voice to improved voice quality, better bandwidth utilization and expanded services into video and television carried over the same technology. Already cost effective VoIP services have been deployed using H.323 and SIP over Intranet infrastructures. However to integrate this with existing ISDN and SS7 architectures and eventually to replace local exchanges and transit exchanges in carrier networks requires large scale signaling and switching changes.

The next generation of telecommunications networks is likely to use IP and for efficient and high-speed quality of service switching deploy MPLS to select routes.

To build soft switches and distribute the switching function over a carrier level infrastructure, gateways will be controlled using H.248, called Media Gateway Control Protocol (MEGACO) by the Internet community.

## Students Will Learn

- Describe How MPLS Functions Today
- Select Between Different Options For Labels To Be Used
- Analyse The Relationship Between MPLS, ATM And Frame Relay
- Identify How Constraint Based Label Distribution Can Enable Qos Selection
- Discuss How Experimental Bits In The Label Header Can Be Used For Qos
- Discuss The Mechanisms Used To Carry Voice Over IP
- Compare SIP, H.323 And Media Gateway Control Protocol
- Employ MEGACO To Build Soft Switches
- Analyse H.248 Protocol Exchanges
- And More...

## Prerequisites

A basic knowledge of IP and ATM will be assumed.

## Course Outline

## **Module I: Introduction To Next Generation Architecture**

Current generation switching

Next generation IP Infrastructure

Switch Control protocols and interfaces

Switching Control: General Switch Management

Switching Function: MPLS and CES

Gateway Control : MEGACO/H.248

## **Module II: MPLS Fundamentals**

Routing options: How do I get from here to there

What MPLS Offers

MPLS Plain Vanilla

Components: LER, LSR, FEC, LDP, LSP, Labels

Label Distribution and Selection Concepts

Explicit Routed LSP

Constraint Based LSP

RSVP interoperation

Label Distribution Methods

Downstream Mode

On Demand

Independent Mode

Label Retention Considerations

Constraints and Label Bumping

Extensions to RSVP

MPLS and ATM

## **Module III: Extending MPLS for Quality of Service**

Constraint based LSP

Link attributes and constraints

Experimental bits in shim header

Delivering QoS

#### **Module IV: Carrying Multimedia Conferences over IP**

Voice over IP Concepts

Control Plane

Information Plane

Signalling functions

IP/TCP/UDP

RTP

CODECs and Encoding Media

RTCP

Example SIP connection

Session Description Protocol

    Defining media streams

Architecture of a Soft Switch

#### **Module V: Media Gateway Control Protocol (MEGACO/H.248)**

H.248 standards and versions

Components of MEGACO

    Contexts

    Terminations: trunks, lines and media streams

    Root Terminations

    Identities

    Notifications

    Events

    Replies

    Digit maps

    Statistics

## Commands

- Add

- Subtract

- Modify

- Service Change

- Audit

## Setting up a connection

- Constructing a context

- Adding terminations

- Signalling on/off hook

- Dialed digit detection

## Terminating a connection

- Subtracting terminations

- Removing contexts

## **Module VI: Analyzing Traces of MEGACO Call Flows**

- Call between two residential gateways

- Other Call traces

## **Evaluation and Review**

## **Delivery Method**

Instructor-Led with numerous case-studies 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**

2 Days