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