

Course Description

With the introduction of Next Generation Networks to telecommunications carrier infrastructures, customers expect a full range of Triple Play services. These include High-Speed Internet Access, Voice Telephony and Television delivered over the same network interface. Existing infrastructures often contain copper loops that must be used to deploy these services. There are several key challenges to delivering IPTV. It will be necessary to deliver TV quality that can match existing over-the-air and cable delivery. It will be necessary to ensure that all services can be delivered together and will not significantly affect the performance of other services. The TV service must be designed, sized and built so that it can grow profitably as take-up increases and can evolve as the technology develops. To meet these challenges a good understanding of IPTV technology is vital.

This course will deliver a comprehensive understanding of the IPTV technology, covering major aspects of the IPTV standard from a business, network, service, architecture, hardware, software, protocols and platforms perspective. It will include practical demonstrations of IPTV transport, Web access and voice active together over a classroom network. It will study practical experiences of early IPTV deployments and consider the sizing, performance and reliability aspects of IPTV service delivery. It will also demonstrate how IPTV transports can be captured and their quality analyzed for monitoring performance. It will further demonstrate how reliable services can be delivered to match defined service criteria.

Students Will Learn

- **Understand The Basics Of Video**
- **Understand The Basics Of IP Networking Technology**
- **Differentiate Between Technologies Such As Streaming, Download And Play, And File Transfer**
- **Use IPTV Protocols And Standards**
- **Select Appropriate Multicasting And Qos Approaches For IPTV**
- **Capture And Analyse Video Transports Over IP Networks**
- **Describe The Function Of MPEG, Multicasting, RTP, And Streaming**
- **Identify The Issues With IPTV And IMS Implementation**
- **Discover Challenges In Implementing Some IP Television Features**
- **And Much More...**

Target Audience

Outside plant and Central office technicians, contractors, union craftsman, electricians, technicians, installers, managers /administrators, engineers, facilities managers, architects and developers, systems engineers, telecom managers and anyone that is interested in and/or working with Triple-Play / IPTV networks and services.

Prerequisites

A basic understanding of telecommunications.

Course Outline

Module I: IPTV Technologies and Standards

Next Generation Broadband Architecture

Access Technologies

Architectures

Core Network Services

Service Provision

Triple Play Services

Digital Broadcast TV

What is IPTV

Web Television

Broadcast TV

Video on Demand (VoD)

IPTV Home Distribution Scenarios

IP Multimedia Services (IMS)

Network and Service Management

IPTV Home Applications and Services

Demonstration of IPTV running in the classroom over Switched LAN

Module II: Standards and Protocols for Triple Play Networks

IETF Standards

RTP, RTCP and RTSP

Multicast services

IGMP

Session Initiation Protocol (SIP)

MGCP and MEGACO

RFC2250 RTP Payload for MPEG1/2 streams

MPEG TS encapsulation (MP2T payload type)

MPEG ES encapsulation (MPV)

Encapsulation of MPEG2 TS on with IP2 mobility management

ITU-T Standards

H.323

H.225/H.245

H.248

H.262/H.264

Demonstration of Triple Play in the classroom Over WAN Service

Motion Picture Experts Group (MPEG)

MPEG-1, MPEG-2, MPEG-4

MPEG-3 Audio

DVB-H / IPDC (DVB Handheld & IP Datacast)

DVB-IP1 A086

DVB-T

ETSI Standards

TISPAN

TS 102 034

Pro-MPEG

Transport of MPEG2 Code of Practice 3 (COP3)

Uncompressed SMPTE 292M (HDTV) (COP4)

DVB services over IP networks

DVB-IPI

Conditional Access System (CAS)

Middleware

Service Discovery (EPG) and Selection

Module III: IPTV Architecture

Models of IP Services

Architecture Layers

Application

Session

Network and Transport

Physical Link

Delivering Network Video and Audio Compression

Protocols

Standards

IPTV Network Equipment

Media Players

IP Set Top Boxes (STP)

Media Routers

Media Servers

MPEG2 TS Based Transport Layer

Demonstration of TV Transport Streams: Capture and playback

Module IV: Multicasting

Multicast Addressing

Deploying Multicasting for network delivery of video

Multicast routing requirements

Multicast routing approaches

Multicast extensions to OSPF

Protocol Independent Multicast (PIM)

Selecting Mode of operation: Dense or Sparse

IGMP

IGMPv1 and v2

RFC 3376 IGMPv3

Protocol exchanges to build a distribution tree using PIM

Protocol exchanges to prune tree

Potential failures and fixes

Demonstration of Multicast TV

Module V: Customer Access

Architecture of Customer Access

IEEE 802 deployment options

IEEE 802.1Q VLAN Tagging

- EFM
- xDSL Access
 - ADSL2 and ADSL2+
 - VDSL and VDSL2
- PON and Fiber loops
- Sizing Access for IPTV services

Module VI: Quality of Service

- Definition of Service Quality
- Layer 2 and Layer 3 QoS compared
- Quality of Service Tools
 - 802.1P
 - RSVP
 - WFQ
 - DiffServ, DSCP
 - MPLS
- Queuing Delays

Demonstration of queuing delay calculation

Module VII: IPTV Implementation

- IPTV Challenges
 - Content Distribution Rights
 - Data Transfer Rate Capability
 - Media Player Compatibility
 - Channel Changing Time (Channel Surfing)

- Content Licensing
- Regulations
- Operations Support Systems
- Network Capacity
 - Sizing total network capacity
 - Positioning VoD Services
- Reliability
 - Access Device Reliability
 - Data Network Reliability
 - Data Connection Reliability

Delivery Method

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

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