

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
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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-IPI 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