broadcast communications

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Training Course Description

Course: **IPTV (IP Television) Essentials**
Course code: **ESS105**
Duration: **3 day**

Format: Classroom explanation and demonstration.

Supporting materials:

Each delegate completing the course will receive the following:

- A full set of course notes
- Certificate of attendance

Overview:

The course provides delegates with an understanding of the technologies, vocabulary, techniques IPTV, MPEG audio and video signal processing, IP and TV convergence technologies. The course covers the conversion of the audio and video base band signals into MPEG elementary streams and transport streams, the addition of PSI and DVB SI tables, and IP, UDP ,TCP encapsulation, multicast and unicast data carriage.

Who should attend:

Technical staff working in a convergence environment who need an understanding of the specific technologies and issues associated with implementing and working with IPTV systems.

Prerequisites:

A general familiarity with technical concepts is assumed. A PC video projector should be available for presentation and to show demonstration sequences.

Key benefits:

At the end of the course delegates will be able to:

- Describe IPTV architectures and processes
- Describe the MPEG audio and video compression processes
- Understand the limitations and effects of signal compression and IP carriage
- Describe the MPEG Elementary and Transport streams
- Understand the issues involved in manipulating MPEG signals
- Understand IP network issues impacting on television transmission
- Describe the IP multicast and unicast processes

Course Content:

Baseband Television and Audio
- Digital and analogue, component and composite video
- Television standards, PAL, NTSC, DVB andATSC
- Video sampling structures, 4:4:4, 4:2:2, 4:2:0
- SDTV, HDTV (high definition TV) and aspect ratios
- Progressive scan and interlace, frame rates
- Digital and analogue audio

MPEG-2 Video Compression
- MPEG standards, Levels and Profiles
- Intra and Inter frame coding, I frames, P and B frames
- MPEG structure, GOPs (Groups of Pictures) Slices, Macroblocks and Blocks
- Motion estimation
- Discrete Cosine Transform (DCT)
- Zig Zag scanning, run length and entropy (Huffman) encoding
- Progressive and non-progressive scan DCT modes

MPEG-4 Video Coding
- MPEG-4 part 10 AVC and H264
- Adaptive block coding
- De blocking filter
- Integer transform coding
- Entropy coding
- Performance comparison with MPEG-2

MPEG Audio Compression
- MPEG Audio Layers and modes
- Sample frequencies and bit rates
- Psycho-acoustic audio coding

MPEG in Practice
- Choosing the right compression options
- Picture assessment quantisation and compression artefacts
- Statistical Multiplexing
- CA (Conditional Access) and DRM (Digital Rights Management)

MPEG-2 System Layer and DVB SI tables
- The PES, Packetised Elementary Stream
- The Transport Stream and Program Stream
- MPEG PSI, PIDs, PATs and PMTs
- DVB SI and tables structure, NIT, TDT, TOT, EIT, BAT etc.
- MPEG testing and measurement

IP Encapsulation and Transmission
- 100 base TX and Gigabit Ethernet, jumbo frame considerations
- IP Unicast and multicast
- IP addressing
- RTP (Real Time Protocol), TCP and UDP
- Network reliability and latency issues
- Multicast routing protocols, and implications for services
- Pro-MPEG / COP3 forward error correction (FEC)
- DSL and ADSL access considerations
- Traffic analysis using protocol analyser