Acronyms and Glossary of Terms Relating to Digital TV Systems, DVB, Interactive TV & Multimedia Home Platform (MHP) Ver. 6.2

Introduction

For acronyms, consult the "**List of Acronyms and Abbreviated Terms" commencing on <u>page 3</u>** first and then the "Description of Technical Terms" if a more detailed explanation is required.

Contents:

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1. List of Acronyms and Abbreviated Terms

Term	Meaning	Page, Item No.
Numbers		
405 line	Early UK black & white TV system- no longer used.	
480i	Used in NTSC – interlaced at 59.94 (60) fields per sec.	94, 34
480p	480 lines 60 frame per sec progressive scan	
525 line	Total number of lines in a NTSC picture including vertical blanking lines (VBI).	94, 34
576i	Used in PAL – 576 TV lines (active video), interlaced – i.e. the odd numbered half of 576 lines in field 1 followed by the even half in field 2, at 50 fields per second (25 pictures per second)	104, 36
576p	576 TV lines (active video) progressive scan – i.e all lines in sequence. 576 50p at 50 frames (pictures) per second	
625 line	Total number of lines in a (PAL) 576 line picture including vertical blanking lines (VBI).	104, 36
720p	720 TV lines (active video) progressive scan – i.e. all lines in sequence. Could be at 60, 59.94 or 50 frames a second. Also at film rates ie. 24fps	
750 line	Total number of lines in a 720p line picture including vertical blanking lines (VBI).	
819 line	French black & white TV system- no longer used.	
1035i	Japanese Hi-Vision Analog system -1035 TV lines (active video), 1125lines total interlaced, 60, fields a second.	
1080i	1080 TV lines (active video), interlaced – i.e. 540 of the odd numbered lines in field 1 followed by 540 lines in field 2. Could be at 60, 59.94 or 50 fields a second. Total lines in professional equipment 1125, but in 50Hz (consumer) may also be 1250 line total.	
1080p	1080 TV lines (active video) progressive scan – i.e. all lines in sequence. Could be at 23.97, 24, or 25 frames a second. Future development might include 50 & 60 Frame/sec.	
1125 line	Total lines including vertical blanking of 1035 or 1080 active line formats at 23.97 or 24 or 25 or 29.97 or 30 frames/sec interlace or progressive.	
1152i	1152 TV lines (active video), interlaced 50 field/sec - originally for European HD-MAC system but also for 50Hz domestic CRT display implementation of 720P and 1080i formats	
1250 line	For 50 Hz only –1250 total lines including vertical blanking of 1152 active line formats including consumer CRT display implementation of 720p and 1080i.	
2K (8K)	Two (eight) thousand radio frequency carriers – (DVB-T)	21, 37
3G	3rd Generation mobile telephony (aka UMTS; also 2.5G GPRS)	
3GPP	3G Partnership Project	
4:2:2	Refers to the digital sampling ratio of the components of a video signal – ie. the luminance (monochrome) and 2 colour-difference signals. Sometimes used to mean an **SDI** signal. Also 4:1:1 and 4:2:0 in '**DV**'	
4:2:2:4	Digital SDI system that includes an extra 'alpha' channel of luminance only key signal for editing	
4:3	Standard Aspect Ratio picture dimensions – the width is 1.33 wider than the height. (Also 16:9, 1.85:1 etc.)	
4:4:4	Full bandwidth sampled SD video for RGB editing – usually from a film transfer or graphics	
5C	Five Companies (who propose a DTV content copy protection system for IEEE 1394, see also DTCP)	19, 26
5.1 **Also 6.1, 7.1**	Five-point-One (Surround Audio channels)	14, 1

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Term	Meaning	Page, Item No.
8-VSB	8 amplitude levels Vestigial Side Band (type of RF carrier modulation used for ATSC DTV)	

A

Term	Meaning	Page, Item No.
AAAA	American Association of Advertising Agencies	
AAC	Advanced Audio Coding (MPEG2 – 5.1 or 7.1 channels)	
AAF	Advanced Authoring Format (Metadata)	16, 12
AANA	Association of Australian National Advertisers	
ACIF	Australian Communications Industry Forum www.acif.org.au	
ACVL	Association of Cinema and Video Laboratories http://www.acvl.org/	
A/D or ADC	Analog to digital (convertor)	
ADSL	Asymmetric Digital Subscribers Line (high speed data over telephone wire)	
AES	Audio Engineering Society AES/EBU usually refers to digital audio data standards	
AFA	Advertising Federation of Australia	
AFD	Active Format Descriptor (DVB/MPEG wide-screen signalling)	
AFTRS	Australian Film Television and Radio School http://www.aftrs.edu.au/	
AHG	Ad-Hoc Group	
AIT	Application Information Table (DVB MHP specification)	15, 7
aka	also known as	
AMIA	Association of Moving Image Archivists http://www.amianet.org/	
ANSI	American National Standards Institute –US member of ISO and IEC, www.ansi.org	
ANT	Action Notification Table (used in DTV data streams by Canal Plus – see also DNT)	
AOL	America On Line (ISP)	
API	Application Programming Interface	8, 15
app	Application	15, 6

Term	Meaning	Page, Item No.
ARIB	Association of Radio Industries and Businesses (Japanese DTV)	
ASCII	American Standard Code for Information Interchange (data transmission)	
ASI	Asynchronous Serial Interface	15, 9
ASN.1	Abstract Syntax Notation No. 1	
ASTBs	Advanced Set Top Boxes	
ATM	Asynchronous Transfer Mode	
ATSC	Advanced Television Systems Committee (USA Digital TV)	
ATVEF	Advanced Television Enhancement Forum (mainly US)	15, 10
AU	Access Unit (MPEG data)	
AV	Audio-Video (also A/V inputs and outputs)	
AVC	Advanced Video Coding DVB-AVC group working on MPEG-4)	
AWT	Abstract Windowing Toolkit (Java) (pronounced 'ought')	

B

Term	Meaning	Page, Item No.
BAT	Bouquet Association Table (in DVB transmissions)	
BCD	Binary Coded Decimal (data)	
BER	Bit Error Ratio	
BIFS	Binary Format for Scene	
bit (b)	binary digit (i.e. a '0' or '1')	
Blu-ray	Blue-laser DVD format developed by 9 companies for 27Gbyte capacity (for HDTV).	
BML	Broadcast Markup Language (Japan)	
Byte (B)	8 bits of data (a binary number with one of a possible 256 discrete values - aka 'octet')	

C

Term	Meaning	Page, Item No.
CA	Conditional Access (to encrypted services)	18, 21
CD	Committee Draft (stages of progress of international standards- see also FCD)	
CAS	Conditional Access System	
CAT	Conditional Access Table	
CATV	Community Antenna Television	
CBR	Constant Bit Rate (Data - see VBR)	

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Term	Meaning	Page, Item No.
CC	Closed Captions – Subtitles displayed at viewer's choice	17, 17
CCIR	Now ITU-R (formerly International Consultative Committee, Radio -in French)	
CCITT	For Telephony & telegraphic standards – now called ITU-T	
CENELEC	Comité Européen de Normalisation Electrotechnique	
CI	Common Interface (DVB receiver plug-in card specification)	17, 20
CIE	Comité Internationale d'Éclairage (International Commission on Illumination) - Colorimetry, eg RGB Colour co-ordinates for colour TV picture tube phosphors	
CIF	Common Image Format (for MPEG1 & computers 352 x 240 pixels) Also SIF	
CISPR	Comité International Spécial des Perturbations Radioélectrique (radio interference EMR standards)	
CLDC	Connected, Limited Device Configuration (Java)	
CLUT	Colour Lookup Table (Data transmission graphics)	17, 19
CM	Commercial Module (DVB committee)	
C/N	Carrier to Noise ratio	
CODEC	Coder Decoder (combination)	
COFDM	Coded Orthogonal Frequency Division Multiplex (DVB-T) (*pronounced Coff-dum*)	17, 18 21, 37
CORBA	Common Object Request Broker Architecture	
CPTWG	Copyright Protection Technical Working Group	18, 22
CPU	Central processor unit (Computers)	
CRC	Cyclic Redundancy Check (Error check, usually at end of a data transmission sequence)	
CRID	Content Reference ID (*TV-Anytime*)	
CRL	Certificate revocation list (MHP)	
CRMS	Customer Relationship Management Centre	
CSS	Cascading Style Sheets (Web)	
CVBS	Composite Video Baseband Signal	

Term	Meaning	Page, Item No.
D		
D1	First international digital video tape format from CCIR (ITU-R). Sometimes (wrongly) used to mean SDI. Other formats D2, D3, D5 ... D9..D11	
D-VHS	Digital - Video Home System (Consumer digital tape format)	
D/A	Digital-to-Analogue converter	
DAB	Digital Audio Broadcast (EBU preferred digital radio)	
DaDo	Data Download –Now referred to as SSU (DVB - receiver software upgrade over-the-air)	
DARS	Digital Audio Reference Signal	
DASE	DTV Application Software Environment (USA –ATSC iDTV committee)	
DAVIC	Digital Audio-Visual Council (Parent group for most iTV, now disbanded into new groups)	
dB	deciBel – logarithmic based measurement ($1/10^{th}$ Bel)	
DBA	Digital Broadcasting Australia http://www.dba.org.au/	
DC	Digital Cinema	
DCAP	DTV Common Application Platform (U.S. – Cable & DTT)	
DCT	Discrete Cosine Transform (Compression method in MPEG)	
DDE	Declarative Data Essence (SMPTE from ATVEF)	
DDL	Description Definition Language (see MPEG-7:ISO/IEC 15938-2)	
DDR	Digital Disk Recorder	
DDWG	Digital Display Working Group (See DVI)	19, 28
DECT	Digital Enhanced Cordless Telecommunication (portable phone standards)	
DigiTAG	Digital Terrestrial Action Group (Europe DTV committee)	
DID	Digital Item Declaration (MPEG-21)	
DII	DownloadInfoIndicator (MHP or data broadcast DSM-CC message)	
DII(&)D	Digital Item Identification & Description (MPEG-21)	

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Term	Meaning	Page, Item No.
DIT	Discontinuity Information Table (in DVB transmissions)	
DLP™	Digital Light Processing (for video & data projectors from Texas Instruments Inc)	
DNT	Download Notification Table (DVB ?)	
DOCSIS	Data Over Cable System Interface Standard (for Cable-TV modems by CableLabs USA)	
Dolby-E	Studio digital format to carry 5.1 channel audio & audio metadata	14, 1
DOM	Document Object Model (Web)	
DRAM	Dynamic Random Access Memory	
DRM	Digital Rights Manager (Also Digital Radio Mondiale)	
DSM-CC	Digital Storage Media Command and Control (MPEG2-Part6) (Data playout carousel)	20, 33
DSM-CC-OC	Digital Storage Media - Command and Control Object Carousel	
DSM-CC-UU	Digital Storage Media - Command and Control User-to-User	
D-Sub	VGA video socket 15pin 'D' sub-miniature with RGB and H & V sync – as on PCs & HD STBs.	
DTCP	Digital Transmission Content Protection (see 5C)	19, 26
DTD	Document Type Definition (W3C)	
DTG	Digital TV Group (UK)	
DTH	Direct To Home (via Satellite)	
DTT	Digital Terrestrial TV	
DTTB	Digital Terrestrial Television Broadcasting	
DUN	Dial-Up Networking	
DV	Digital Video or **DVC** (small tape cassette format)	
DVB	Digital Video Broadcasting	19, 27
DVB-C	Digital Video Broadcasting – Cable	
DVB-data	Digital Video Broadcasting - Data Broadcasting	
DVB-J	DVB-Java	20, 34
DVB LA	DVB Licence Administration	33, 87
DVB-MHP	Digital Video Broadcasting – Multimedia Home Platform	34, 91

Term	Meaning	Page, Item No.
DVB-RCT	Digital Video Broadcasting – Return Channel Terrestrial	
DVB-S	Digital Video Broadcasting – Satellite	
DVB-T	DVB-Terrestrial	21, 37
DVC	Digital Video Cassette	
DVI	Digital Visual Interface (interconnect standard)	19, 28
DVI/HDCP	Digital Visual Interface/ High Density Copy Protection	19, 29

E

Term	Meaning	Page, Item No.
EACEM	European Association of Consumer Electronics Manufacturers (merged into EICTA in 2001)	22, 42
EAV	End of Active Video - see SAV	
EBU	European Broadcasting Union	
ECG	Electronic Content Guide (TV-Anytime)	
ECM	Entitlement Control Message (for DVB- CA)	
ECMA	European Computer Manufacturers Association	21, 39
EDTV	Extended Definition Television	
EHRI	Extremely High Resolution Imagery (digital cinema)	
EIA	Electronic Industries Alliance (formerly Association) (mainly USA standards)	
EICTA	European Information, Communications and Consumer Electronics Technology Industry Association.	22, 42
EIS	Event Information System	
EIT	Event Information Table (DVB SI contains EPG information)	39, 129
EMC	Electro-Magnetic Compatibility (for interference control)	
EMM	Entitlement Management Message (for DVB- CA, see also ECMs)	
EMR	Electro-Magnetic Radiation	
EPG	Electronic Programme Guide	22, 44
ETSI	European Telecommunications Standards Institute	22, 45
EVM	Error Vector Magnitude (measurement of DVB-T COFDM – see MER).	30, 79

Term	Meaning	Page, Item No.
F		
FC	FIBRE Channel	
FCD	Final Committee Draft (stages of progress of international standards - see also CD)	
FDAM	Final Draft Amendment (in ISO/IEC, ITU & other international standards documents –see also FDAM)	
FEC	Forward Error Correction (data transmission)	23, 48
FFT	Fast Fourier Transform (eg for COFDM)	
FIAF	Fédération Internationale des Archives du Film (International Federation of Film Archives) http://www.fiafnet.org/	
FIFO	First In, First Out (data)	
FTA	Free-to-air	23, 49
FTP	File Transfer Protocol	
FS-VDSL	Full Service-Very high speed Digital Subscriber Line	
G		
G703	ITU-R Data interface standard	23, 51
GDMO	Guidelines for Definition of Managed Objects	
GEM	Globally Executable MHP	
GENA	General Event Notification Architecture (from IETF)	
GIF	Graphics Interchange file Format (originated by Compuserve)	
GOP (GoP)	Group Of Pictures (MPEG – number of video frames in the compressed digital sequence starting with an I-Frame)	24, 52
GPRS	General Packet Radio Service (2.5G mobile telelephony)	
GPS	Global Positioning System	
GSM	Global System for Mobile communications or Group Special Mobile	
GUI	Graphical User Interface (pronounced goo-ee)	
GUID		
GXF	General Exchange Format	16, 12

Term	Meaning	Page, Item No.
H		
HAVi	Home Audio Video interoperability (user interfaces and home networking adopted as part of MHP www.havi.org/)	24, 53
HD	High Definition	
HF	High Frequency band of frequencies in the range of 3 to 30 MHz, aka. short-wave band	
HSDPA	High Speed Downlink Packet Access (eg in 3G data link)	
HTML	Hypertext Mark-up Language	26, 53
HTTP	Hyper Text Transport Protocol	26, 60
Hz	Hertz (measurement of frequency – formerly Cycles per second).	
I		
I-Frame	Intra-coded (video) Frame (MPEG & MHP)	
I/O	Input / Output	
IBOC	In-Band-On-Channel (digital radio system)	
IBTN	EBU International Broadcast Tape Number	
iDTV	Integrated Digital TV (also iTV)	
IEC	International Electrotechnical Commission (based in Europe)	
IEEE	Institute for Electrical and Electronic Engineers (USA based but international)	
IEEE-802	LAN Ethernet standard eg. 802.11b – 2.4GHz wireless	29, 74
IEEE-1394	Data interconnect standard (aka FireWire or i.Link™)	26, 61
IETF	Internet Engineering Task Force	27, 66
IHDN	In-house Digital Network (DVB standards group)	
i.Link	IEEE1394 data link by Sony	
IP	Internet Protocol (**IPv4** or 6 – version 4 or 6)	
IPMP	Intellectual Property Management and Protection (MPEG & DVB-LA)	
IPPV	Impulse Pay-Per-View	
IPPs	Information Privacy Principles	
IPR	Intellectual Property Rights	
IRD	Integrated Receiver Decoder (usually for satellite DTV)	

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Term	Meaning	Page, Item No.
IrDA	Infra-red Data Association (data link on PDAs, notebookPCs www.irda.org)	
IrLAP	Infra-red Link Access Protocol	
IRT	Institut für Rundfunktechnik GmbH (German broadcast engineering research centre)	
ISCI	Industry Standard Coding Identification (AAAA US commercials)	
ISDB	Integrated Services Digital Broadcasting (Japan)	
ISDN	Integrated Services Digital Network	
ISMA	Internet Streaming Media Alliance	
ISO	International Standardisation Organisation	27, 64
ITU-R	International Telecommunication Union –Radiocommunication (Formerly CCIR)	27, 65
ITU-T	International Telecommunication Union –Telecommunication (formerly CCITT)	
iTV	Interactive TV (see also iDTV)	
IVR	Interactive Voice Response	

J

Term	Meaning	Page, Item No.
J2ME	Java2 Micro Edition	27, 70
JBIG	Joint Bi-level Image Experts Group	
JDK	Java Development Kit	27, 70
JFIF	JPEG File Interchange Format also '.jpg'	
JMF	Java Media Framework	27, 70
JP2	JPEG-2000 image file - ITU-T Recommendation T.800	ISO/IEC 15444-1, JPEG 2000 Image Coding System.	
JPEG	Joint Photographic Experts Group (single picture graphics file format -also 'Motion-JPEG')	
JPEG2000	A more advanced JPEG compression system	
JTC	Joint Technical Committee	
JVM	Java Virtual Machine	27, 70
JVT	Joint Video Team (compression standards with MPEG-4 & DC)	

L

Term	Meaning	Page, Item No.
LAN	Local Area Network	29, 74
LCN	Logical Channel Number (Digital TV UK, Europe, Aust.)	
LMDS	Local Multipoint Distribution System (Radio at SHF)	
LVDS	Low Voltage Differential Signalling (eg - DVB parallel interface)	

M

Term	Meaning	Page, Item No.
MAC	Media Access Control -similar to data-link layer in OSI model, -address, eg. port-address for LANs – see OUI	
MAU	Metadata Access Unit	
MCP	Multimedia Car Platform German DVB-mobile	
MCS	Multiplex Configuration System	
MDD	Managed Data Dictionary (SMPTE)	
MEG	MHP Experts group (DVB-MEG working group)	
MER	Modulation Error Ratio	79, 30
MFN	Multi Frequency Network (DVB-T See also SFN)	
MHEG	Multimedia and Hypermedia Expert Group (ISO) (UK iDTV)	33, 90
MHP	Multimedia Home Platform - DVB Interactive TV standard	34, 91
MIB	Management Information Base for SNMP monitoring (or Men In Black!)	30, 76
MIP	Mega-frame Initialization Packet (synchronisation packet in TS for DVB-T SFNs)	
mips	Million instructions per second	
MJD	Modified Julian Date	30, 78
MMDS	Multichannel Multipoint or Multipoint Microwave Distribution System	
MMI	Man-to-Machine Interface (MHP)	
MP3	MPEG-1 Layer 3 audio	31, 84 41, 136
MPAA MPA	Motion Picture Association of America (MPA – international)	
MPE	Multi Protocol Encapsulation (DVB data)	

Term	Meaning	Page, Item No.
MPEG	**Moving** Pictures Expert Group (ISO/IEC) also MPEG-1,2,4,7 &21 (see also Pro-MPEG)	31, 83
MPEG-1	Standard for Video/audio digital compression and data flow	31, 83 / 31, 84
MPEG-2	Standard for video/audio digital compression & packetisation	31, 83
MPEG-4	Standard for video/audio digital compression	32, 85
MPEG-7	Aka Multimedia Content Description Interface	32, 86
MPEG-21	Aka "Multimedia Framework"	33, 88
MPEG-LA	MPEG licensing administrator	33, 87
MTBF	Mean Time Between Failure	
MUG	MHP Users Group	
MUX	Multiplex	
MVC	Model, View, Controller	
MVFAST	Motion Vector Field Adaptive Search Technique (in MPEG4)	
MXF	Media Exchange Format	16, 12

N

Term	Meaning	Page, Item No.
NFS	Network File System (developed by Sun Microsystems – widely used to allow computers on a network to access each other's files	
nibble	4 bits (i.e. half a 'byte')	
NIT	Network Information Table (data component of a MPEG-DVB Transport Stream	39, 129
NPPs	National Privacy Principles (Schedule 3, Privacy Act 1998, amended by Private Sector Act 2000 Australia	
NRZ	Non-Return to Zero (Method of 0 & 1 data flow or transmission)	
NTSC	National Television Systems Committee (US analog color TV standard –525line-60 field/s i.	34, 94
NVOD	Near Video On Demand	

O

Term	Meaning	Page, Item No.
OAD	Over-the-Air Download – see SSU	
OC	Object Carousel (as in a data playout system)	
OCAP	Open Cable Application Program (USA –cableTV)	

Term	Meaning	Page, Item No.
OEM	OriginalEquipment Manufacturer - usually for any item that is not going to final user.	
OID	Object Identifier (for SNMP)	
OMF	Open Media Format (Video audio file format for editing originally proposed by Avid)	16, 12
OS	Operating System	
OSD	On-screen display	
OSI	Open Systems Interconnection (7 layer model for data communication ISO/IEC7498-1)	
OUI	Organisationally Unique Identifier (part of a MAC address - identifies vendor - is 1st 3 bytes of 6 byte field -administered by the IEEE)	29, 74

P

Term	Meaning	Page, Item No.
PAL	Phase Alternate Line – Analog Colour TV system used in Australia.	36, 104
PAL-B	An ITU-R designation for a 625 line/ 50field/s Colour TV system transmitted in a 7MHz channel with 5.5MHz FM sound. At VHF & UHF in Australia.	36, 104
PAL-G	As with PAL-B but in an 8MHz channel – mainly Europe UHF	
PAL-I	As with PAL-G but 6MHz sound – Mainly UK, NZ, HK	
PAN	Personal Area Network (transfer of electronic data by human touch/contact – from IBM also WPAN))	29, 74
PAT	Program Association Table (MPEG SI)	37, 113
PCM	Pulse Code Modulation	
PCMCIA	Personal Computer Memory Card International Association (Also for computer plug-in card as used in most notebook PCs)	35, 102
PCR	Program Clock Reference (MPEG)	37, 114
PDA	Personal Digital Assistant (Hand/Palm – held personal organiser)	
PDAM	Proposed Draft Amendment (in ISO/IEC, ITU & other international standards documents –see also FDAM)	

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Term	Meaning	Page, Item No.
PDC	Programme Delivery Control (Analog PAL TV VBI signalling to VCRs – also VPS - German Videoprogrammiersystem)	
PDR	Personal Digital Recorder (aka PVR, DDR)	
pel	Picture Element (picture divided into small elements that are individually analysed).	
PES	Packetised Elementary Stream (MPEG data stream)	
pfd	Power Flux Density	
PFR	Portable Font Resource (MHP)	36, 106
PID	Packet Identifier (DVB/MPEG)	35, 100
PKI	Public Key Infrastructure (Security on Web & MHP)	
PLL	Phase Locked Loop (to synchronise an oscillator)	
PMT	Program Map Table (DVB/MPEG)	37, 115
PNG	Portable Network Graphics (graphics file format)	36, 107
PnP	Plug and Play (Computer equipment)	
POD	Point Of Deployment module (US –ATSC plug-in CA card)	
POTS	Plain Old Telephone Service	
PPP	Point-to-Point Protocol [RFC1661]	
Pro-MPEG	Technical forum promoting all aspects of MPEG compression and interoperability. www.pro-mpeg.org	
PSI	Program Specific Information (MPEG)	37, 117
PSIP	Program & System Information Protocol (US ATSC – similar function to DVB's SI)	
PSTN	Public Switched Telephone Network	
PTS	Presentation Time Stamp (MPEG)	37, 109
PVR	Personal Video Recorder	

Q

Term	Meaning	Page, Item No.
QAM	Quadrature Amplitude Modulation	
QCIF	Quarter Common Image Format (176 pixels x 144 lines eg for PDA displays)	
QEF	Quasi Error Free	

Term	Meaning	Page, Item No.
QoS	Quality of Service	
QPSK	Quaternary Phase Shift Keying (modulated signal carrier)	

R

Term	Meaning	Page, Item No.
RAID	Redundant Array of Independent (or inexpensive) hard-Disks	
RAM	Random Access Memory	
RASP	Random Access to Scrambled Content Process (NDS's PVR technology)	
RC	Return Channel (RCC: cable; RCT: terrestrial)	38, 123
RCA	Root Certification Authority DVB-MHP's highest certificate authority. (Also Radio Corporation of America)	
RCMM	Root certificate management messages (MHP)	
RDD	Rights Data Dictionary (eg. in MPEG-21)	
REL	Rights Expression Language (eg. in MPEG-21)	
RFC RfC	Request for comment	
RFI RfI	Request For Information – OR Radio Frequency Interference	
RGB	Red, Green, Blue – primary (emission) colours and for human eye sensitivity	122, 38
ROM	Read Only Memory	
RS	Reed-Solomon (Data error-correction system)	48, 23
RST	Running Status Table (DVB SI)	
RTOS	Real-time operating system	
RTP	Real-time Transport Protocol	
RTSP	Real Time Streaming Protocol	

S

Term	Meaning	Page, Item No.
SA	Standards Australia (www.sa.com.au/) or, Subscriber Authorisation	
SAN	Storage Area Networks	
SAV	Start of Active Video – see EAV	
SBR	Spectral Band Replication – Improved digital compression of audio used in mp3PRO & CT-aacPlus, also in digital radio DRM & XM Satellite	

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Term	Meaning	Page, Item No.
SCSI (bus)	SmallComputerSystemsInterface (pronounced Scuzi) General purpose multi-wire (parallel) high-speed data interconnect for typically up to 8 devices such as computer hard-disk drives, scanners etc. Evolving standard with versions up to 360 Mbyte per second transfer rate.	
SD	Standard Definition (TV)	
SDH	Synchronous Digital Hierarchy (Telecom networks)	
SDI	Serial Digital Interface (aka D1, Rec ITU-R BT.601/656 & 270Mbps)	126, 39
SDK	Software Development Kit	
SDS	Service Discovery & Selection	
SDT	Service Description Table (DVB SI)	39, 129
SDTI	Serial Digital Transport Interface (a packetised way of carrying data such as compressed video on an SDI circuit)	
SDTV	Standard Definition Television	
SET	Secure Electronic Transaction	
SFN	Single Frequency Network (DVB-T)	40, 133
SGML	Standard Generalized Markup Language (Web)	40, 132
SHF	Super High Frequency (3~30GHz)	
SI	Service Information (DVB-SI)	39, 129
SIF	Source Input Format (also CIF)	31, 83
SIP	Session Initiation Protocol (from IETF & 3GPP for IP signalling & communication)	
SIT	Selection Information Table	
SLA	Service Level Agreement	
SMATV	Satellite Master-Antenna Television	
SMI	Storage Media Interoperability (DVB)	
SMIL	Synchronized Multimedia Integration Language	40, 134
SMPTE	Society of Motion Picture and Television Engineers www.smpte.org & www.smpte.org.au/	
SMS	Short Message Service	
SMSC	Short Message Service Centre	
SMTP	Simple Mail Transfer Protocol	

Term	Meaning	Page, Item No.
SNAP	SubNetwork Access Protocol	
SNMP	Simple Network Management Protocol (IETF- RFC 11576)	
SOAP	Simple Object Access Protocol	
SQL	Structured Query Language (for databases)	
SSDP	Simple Services Discovery Protocol (from IETF)	
SSL	Secure Sockets Layer (encrypted data transfer)	
SSU or SSD	Software System Upgrade or Download (DVB ETSI standard for receiver bug fixes and upgrade). ETSI TS 102 006 V1.2.1 (2002-10); DVB Data Download Specification	
ST	Stuffing Table - DVB/MPEG SI	
Stat Mux	Statistical Multiplexer Combiner for several MPEG services into single transport stream	34, 92
STB	Set-top-box (for cable, satellite or over-the-air TV reception); aka IRD.	
SVG	Scaleable Vector Graphics	
SVGA	Super Video Graphics Adapter	
SWOT	Strengths, Weaknesses, Opportunities, Threats commercial product analysis	

T

Term	Meaning	Page, Item No.
TAI	International Atomic Time (based on a caesium clock)	41, 140
TCP	Transmission Control Protocol	
TCP/IP	Transmission Control Protocol /Internet Protocol	
TDT	Time and Date Table (DVB)	
TIF(F)	Tagged Image File (Format)	
TLS	Transport Layer Security (data protocol in DVB MHP)	
TOP-Text	Table Of Pages Teletext	
TOT	Time Offset Table (DVB)	
TPS	Transmission Parameter Signalling (DVB COFDM)	42, 142
TRACS	Tool Representation and Communication System (eg. with IPMP and MPEG-21)	
TS	Transport Stream (DVB/MPEG)	
TSDT	Transport Stream Description Table (DVB optional)	

Acronyms and Glossary of Terms Relating to Digital TV Systems, DVB, Interactive TV & Multimedia Home Platform (MHP) Ver. 6.2

Term	Meaning	Page, Item No.
TWIM	Terrestrial Wireless Interactive Multimedia	
TVAF	*TV-Anytime* Forum	42, 145

U

Term	Meaning	Page, Item No.
UCS	Universal (Coded) Character Set. An International character code created by ISO (ISO/IEC 10646).	
UDP	User Datagram Protocol	
UHF	Ultra High Frequency (band of frequencies in range of 300 to 3000 MHz)	
UI	User Interface	
UMID	Unique Material Identifier for (video, audio, etc.,) essence. (SMPTE)	42,146
UPID	Unique Program Identifier - for a programme as a work (SMPTE & ATSC A/57)	
UMTS	Universal Mobile Telephone System	
UNT	Update Notification Table (DVB SSU proposal)	
UPC	Universal Product Code	
UPN	Unique Programme Number (ITVA)	
UPnP	Universal Plug and Play http://www.upnp.org/	
URI	Uniform Resource Identifier (see W3C RFC 2396)	
URL	Uniform Resource Locator (see W3C RFC 2396)	
USB	Universal Serial Bus	42, 147
UT	Universal Time (same as GMT)	41, 140
UTC	Universal Time, Co-ordinated (See also Time & date entry)	41, 140
UTF	UCS TransFormation Coding	
U-U	User to User	

V

Term	Meaning	Page, Item No.
VBI	Vertical Blanking Interval (Video parameter)	43, 149
VBR	Variable Bit Rate (Data, MPEG)	43, 148
VCEG	Video Coding Experts Group (ITU-T standardization activity for video compression – see MPEG-4)	32, 85
VCR	Video Cassette Recorder	

Term	Meaning	Page, Item No.
VDSL	Very high speed Digital Subscriber Line	
VESA	Video Electronics Standards Association (USA based)	
VGA	Video Graphics Adapter	
VHF	Very High Frequency (Band of frequencies in the range of 30 to 300 MHz).	
VHS	Video Home System (on 1/2" helical scan tape).	
V-ISAN	Versioned-International Standard Audiovisual Number (See TV-Anytime PVR spec.)	
VM	Virtual Machine (as in JavaVM)	
VoIP	Voice over IP	
VOD	Video On demand	
VPN	Virtual Private Network	
VPS	Video Programme System (EBU - line 16 VBI signal-Videoprogrammiersystem) see also PDC.	
VRML	Virtual Reality Modelling Language	

W

Term	Meaning	Page, Item No.
W3C	World Wide Web Consortium http://www.w3.org/	43, 150
WAN	Wide Area Network	29, 74
WAP	Wireless Application Protocol	
WECA	Wireless Ethernet Compatibility Alliance (changed to Wi-Fi Alliance in Oct2002) http://www.weca.net/	29, 74
Wi-Fi	Wireless LAN at 2.4GHz –IEEE 802b/g and 5GHz IEEE802.11a http://www.wi-fizone.org/	29, 74
WIMP	Windows, Icons, Menus and Pointers	
WPAN	Wireless Personal Area Network	29, 74
WSS	Wide Screen Signalling (EBU – line 23 VBI signal)	43, 151
WWW	World wide web	
WYSIWYG	What You See Is What You Get (pronounced wiss-ee-wig)	43, 152

X

Term	Meaning	Page, Item No.
XDSL	x Digital Subscriber Line	
XHTML	eXtensible HyperText Markup Language	44, 153
XML	eXtensible Mark-up Language	44, 155

Term	Meaning	Page, Item No.
XSD	eXtensible Schema Definition	
XSL	eXtensible Stylesheet Language	

Y

Term	Meaning	Page, Item No.
Y,Cr,Cb	3-part DIGITAL component video format. Luminance (Y) + two colour difference signals.	156, 45
Y,Pb,Pr	3-wire Analog component video format mainly for connecting a DTV set-top-box or DVD player to a video monitor or display. Y=Luminance + Pb, Pr = two colour difference signals.	156, 45

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2. Description of Technical Terms

Term	Relevance	Description
1. **'5.1' channel sound**	Audio	A five point one channel sound system actually has 6 channels of surround sound to better reproduce ambience and provide a more enjoyable listening experience. The 5 channels feed speakers around the listening position and are at centre front, and then left, right, rear left and rear right.
		The extra 'point one' refers to the reduced-bandwidth low frequency effects (LFE) channel where the bass sounds from all directions are combined into a single channel that requires a '(usually larger) **sub-woofer** loudspeaker. This combining can be done, as human hearing cannot sense the direction of these very low frequency sounds below about 100 Hz. This avoids all speakers having to cover the full frequency range, and extended bass response usually requires large speakers and enclosures. In a domestic installation this solution is both lower cost and space saving.
		'Surround sound' systems can source multiple channels either from:
		• stereo (two channel) program that has been captured with the 'ambience' that allows sound delay differences between the two channels to be used to generate surround and rear channel information. This was used in "quadraphonic" systems that appeared in the 1970s. These were replaced with systems such as Dolby® Surround ProLogic™ (I or II);
		• for best performance, from separate multiple channel information carried in consumer digital audio systems such as DTS or Dolby AC-3 (5.1 version in DVDs, USA ATSC and optional on Australian HD) or MPEG-2 (AAC 5.1 and 7.1 channel versions on Japanese DTV).
		• Studio VTR recording of 5.1 channels, which may be done on 2 AES/EBU digital channel pairs using Dolby-E format.
		Other systems in use for home theatre applications include:
		Lucas Film THX®, is actually a quality of replay standard, not a compression standard.
		Digital Theatre Sound (DTS) - includes a complete range of audio compression formats but usually (on DVD), is a lower compression, higher quality, requiring a higher data rate. DTS is capable of encoding at sampling frequencies up to 192 kHz and 24-bit sampling size.
		Advanced Audio Coding (AAC) – appears to evolving to the most versatile range of compression standards based on MPEG-2 Part-7 see Item 3.
		Dolby Digital EX (erroneously referred to as 6.1 channel), adds matrix decoding of extra rear channels and may be included in DVDs post 2002. Newer Dolby Digital Surround EX soundtracks contain a digital flag which can automatically activate EX decoding if fitted. DTS have also introduced a similar system known as DTS-EX.
2. **AC-3**	Digital Audio	A proprietary digital sound system developed (and patented) by Dolby®.
		Also known as Dolby Digital® (www.dolby.com), it can carry multiple channels, including stereo (2.0) (decodable with ProLogic I or II) and 5.1 discrete channel. Extra data can be included to control the dialog levels ('dial-norm') and dynamic range to the listener's choice.
		Variants of the system are used in movie theatres, domestic laserdisk and DVD and in the US ATSC and Australian DVB-T digital broadcast systems. Decode systems may include a second decoder for special requirements.
3. **Advanced Audio Coding (AAC)**	Digital Audio	Originally specified in Part 7 of MPEG-2, AAC is an improved audio compression system. Used in Japanese ISDB, U.S. XM Satellite radio and Radio Mondiale (RDM) and used with MPEG-4 Advanced video coding.
		Recent demonstrations (such as at IBC 2002) have shown advances in this system now known as aacPlus with good quality stereo at 64kbps or less.

	Term	Relevance	Description
4.	**Advanced Television Systems Committee (ATSC)**	Standards for terrestrial DTV (Mainly North America)	The ATSC is a private sector organization formed in 1983 and with headquarters in Washington D.C., USA. Its purpose is the development of voluntary standards for the entire spectrum of advanced television systems. The ATSC has developed a variety of technical standards including the ATSC Digital Television Standard which grew out of a combination of parts of various systems put forward by a consortium of various manufacturers and other interests known as the 'Grand Alliance'. Its basis is a system using 8-VSB modulation to transmit MPEG-2 video and AC-3 audio approved by the FCC for US broadcasters in December 1996.
5.	**American National Standards Institute (ANSI)**	Standards	A US standards body. http://www.ansi.org/
6.	**App.**	Interactivity	Application. Also 'signed App' – application with verified authenticity.
7.	**Application Information Table (AIT)**	MHP	Part of a DVB/MPEG transport stream that provides information about MHP applications associated with a particular service. For each application this information includes - The application type (e.g. DVB-J application or plug-in application); An application identifier that uniquely identifies the application; An application control code that controls the lifecycle of the application; The last of these entries says that the lifecycle can be controlled by the information sent in the AIT.

When the user selects a service, the control codes in the AIT are read. The AIT for a specific service is sent at frequent intervals and the application control flag can be updated between AIT versions. In this way the service provider can control the applications in the service; e.g. a news application is set to be AUTOSTART at the time when the 6:00pm news begins. |
| 8. | **Application Programming Interface (API)** | Interactivity | Software that provides access to a system's services. |
| 9. | **Asynchronous Serial Interface (ASI)** | MPEG Data Standard | Commonly used for carrying (MPEG) compressed program (video, audio, etc.) as packet data on conventional digital TV studio 270Mb/s distribution and routing systems designed for uncompressed video per **Rec ITU-R BT.601** and **656**. The MPEG data stream payload can typically be equivalent to only several Megabit/sec up to say 34Mb/s. To be compatible to 270Mb/s equipment, the data is clocked at 270Mb/s, which bunches up the data and leaves intervening periods with no data (bursty mode). Normally these gaps are filled with coded filler (ASI stuffing bytes) to present a continuous stream.   refer byte gap & gap size:

Number of 10-bit, K28.5 special character commas inserted between bytes within transport stream packets in the ASI transmission protocol. Special character commas are used as stuffing data to spread out transport stream packets in time.

Refer : DVB Blue Book "Implementation Guidelines for the Asynchronous Serial Interface" DVB Document A055 May 2000; and, **ETSI TR 101 891** V1.1.1 (2001-02) Digital Video Broadcasting (DVB); "Professional Interfaces: Guidelines for the implementation and usage of the DVB Asynchronous Serial Interface (ASI)". Also En50083-9.1998. |
| 10. | **ATVEF** | Standards | Advanced Television Enhancement Forum : -Consortium of hardware manufacturers and broadcasters established with the intention of creating a single standard from the various protocols used to link television with the Internet. Defined protocols for Hypertext Markup Language (HTML)-based enhanced television, which allow content creators to deliver enhanced programming over all forms of transport (analog, digital, cable, and satellite) to any intelligent receivers. www.atvef.com |
| 11. | **Back-Channel** | Interactive DTV | See Return Channel- page 38, item 123 |

Term	Relevance	Description
12. **Broadcast stream/file formats**	Metadata	Various formats have been developed for storage and transmission. Motion JPEG and MPEG-I-Frame compressed intra-frame formats such as DV and DVCPRO are successful for non-linear editors, camcorders and news applications. Long GoP MPEG is heavily used in emission systems. A class of file formats have been developed specifically for broadcast applications. An early but unsuccessful proposed format was Open Media Format (OMF). The need for extra information (Metadata) has lead to General Exchange Format (**GXF**) developed by Tektronix/Grass Valley Group meets the needs of on-air operations and archiving. This format's structure has been disclosed and is now a SMPTE standard, (360M). The Pro-MPEG Forum (www.Pro-MPEG.org), is working on a similar format named Media Exchange Format (**MXF**).
		The **AAF** Association (www.AAFassociation.org) has made a first release of a file format, API specification and Software Development Kit. This format is derived from the OMF initiative. AAF has been adopted by several vendors and is currently being standardized by SMPTE. AAF supports a wide range of features needed to build post production and high-end editing applications and supports the SMPTE metadata model.
13. **bytecode**	MHP	A program written in Java needs to be "compiled" into an intermediate language called bytecode, for transmission to a range of different platforms. When received, the bytecode cannot run by itself but must be converted (interpreted) into that platform's machine code by that platform's Java Virtual Machine.
14. **Carrier-to-Noise Ratio (C/N or CNR)**	Transmission	Carrier-to-noise ratio: A measurement of the received carrier power relative to the power of background noise at the receiver input. In effect, a measurement of the quality of a radio (electromagnetic) transmission received dependant on the bandwidth, transmission power, path loss and propagation conditions between transmitter and receiver. C/N can be measured under different conditions for digital terrestrial TV reception and are known as: • Gaussian - 'ideal' apart from the addition of white Gaussian noise. • Ricean - a channel with a prominent direct path between transmitter and receiver, but with a number of echoes present. • Rayleigh - a time-varying frequency selective fading model for an RF channel. It could be a channel with no direct path between transmitter and receiver.
15. **Cascading Style Sheet (CSS)**	MHP	Cascading Style Sheet language is a simple mechanism for adding style (e.g. fonts, colors, spacing) to Web documents. (http://www.w3.org/Style/CSS/)
16. **CENELEC**	Standards	European Committee for Electrotechnical Standardization.

Term	Relevance	Description
17. **Closed Captions (CC)**	Support for Hearing Impaired or other languages	CCs or closed Subtitles are provided with a program that when decoded, at the viewer's choice on appropriately fitted equipment will display the text of the audio superimposed over the picture. Multiple subtitles in different languages may be provided and/or only for the hearing impaired (where notification of sound effects are included). Such services are provided in different standards for different media such as DVD and analog and digital broadcast.
		In the USA, NTSC analog TV services provide CCs via a low speed VBI data system known as 'Line 21' as specified in EIA608. Unfortunately this sometimes causes confusion with international suppliers as co-incidentally in Australia PAL TV services, the closed caption data are also on VBI 'line 21' (and also 334 on field 2), but these use the higher speed EBU Teletext data system.
		These teletext closed captions operate independently to any other teletext service (parallel mode) that may be carried on earlier lines in the VBI.
		The Australian convention is to assign the captions to Teletext magazine 8, page 01 – ie. page 801, whereas in NZ, Europe and the UK, the teletext closed captions are normally on page 888.
		DVB digital services, by converting the CCs to packetised data, may also carry teletext for closed captions (see **EN 300 472**) or DVB's 'Subtitle' system where "bit-mapped" images of characters (such as Chinese characters), may be transmitted (see **EN 300 743**).
		Australian CC operations are covered in C.TVA (FACTS) operating practice **OP42**.
18. **COFDM**	DVB–T Transmission	A method of coded OFDM used by DVB for digital terrestrial television broadcasting (see DVB-T and OFDM).
19. **Colour Look-Up Table (CLUT)**	Graphics	For DTV on-screen-displays, the CLUT is a look-up table of colour values for translating an object's pseudo-colours into screen display colours. It is a way of simplifying the amount of data required to display an object but has the limitation that only 4, 16 or 256 colour values are allowed somewhat like early PC EGA graphics systems. Not all decoders may support a CLUT with 256 entries. A palette of four colours would be enough for graphics that are basically monochrome, like subtitles, while a palette of 16 colours allows for cartoon-like coloured objects.
20. **Common Interface (CI)**	DVB	A DVB specification for an expansion socket on a digital television receiver using a PCMCIA (PC-Card) socket similar to that found on most notebook PCs. Cards can be used for a variety applications such as memory expansion or adding a CA system complying with the "Simulcrypt" or Multicrypt standards (see below).

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Term	Relevance	Description
21. **Conditional Access (CA)**	Encryption	Conditional access refers to methods that scramble or encrypt program video and audio, or private data, so that it may be received only by 'authorized' receivers. A number of different 'private' schemes using authorisation 'SmartCards' have been used by Pay-TV operators working primarily via satellite The arrangements for terrestrial TV services generally require free-to-air services to be receivable without CA authorization but it is possible to also include additional encrypted services in a transmission that do.
		In Europe, a Common Scrambling Algorithm was developed to be used in conjunction with the standard MPEG data transport and selection mechanisms. Thus it is possible in a single DVB transmission to have a scrambled program that is accessible to viewers subscribing to different PAY-TV operators who have agreed to share the transmission channel. The data stream could carry multiple authorisation messages, generated by a number of different CA systems which enable access control of the same scrambled broadcast. This '**Simulcrypt**' technique allows both the delivery of one program to a number of different decoder populations that contain different CA systems, and also for the transition between different CA systems in any decoder population, for example, to recover from piracy. The price to pay is extra data bandwidth needs to be allocated to carry subscribers' enabling messages (ECMs & EMMs) for each CA system. This of course will vary dependant on the number of subscribers.
		A '**Multicrypt**' option is also available, facilitated by the Common Interface (DVB-CI) specification proposed for standardization by CENELEC (European Committee for Electrotechnical Standardization). The CA module may operate in conjunction with a smartcard or with a PCMCIA card as popularly used with lap-top PCs.
22. **Copyright Protection Technical Working Group, CPTWG**	Copy Protection Standards	An ad-hoc cross-industry body organized to evaluate content protection technologies, for technology that can protect digital that is transmitted across the i.LINK (IEEE1394) digital interface. http://www.cptwg.org/
		(See also Digital Transmission Content Protection DTCP Item 26).
23. **Data carousel**	MPEG Data	Data is transmitted repetitively. It can be used for downloading various data in broadcasting where if some data is lost on the first pass it may be acquired on subsequent retransmissions. Teletext pages are an example. See DSM-CC:Digital Storage Media-Command & Control, item 33, page 20.
24. **Declarative application**	Type of Software	An application that primarily makes use of declarative information to express its behaviour – eg. an XML document or DVB-HTML. Compare with a "procedural application" Item 110, page 37
25. **Differential latency**	Picture – sound synchronisation	Also known as synchronization latency. The time that data is presented to a decoding device relative to the time its associated video is presented to the same decoding device. (eg. lip-sync)

Acronyms and Glossary of Terms Relating to
Interactive TV & Multimedia Home Platform (MHP)

Term	Relevance	Description
26. **Digital Transmission Content Protection DTCP, 5C & 4C Entity**	Content Protection Standards	The DTCP standard (also known as **5C**), is intended to control copying of video and audio entertainment content in consumer digital equipment such as digital TV receivers and recorders that use interconnection via i.Link /firewire (IEEE 1394) links.
		The program material is subject to an encryption protocol that protects from illegal coping, theft or tampering when being passed between equipment via high-speed serial buses using IEEE 1394. This specification is considered to be the safest illegal copy protection system for current home appliances. DTCP specifies a mechanism that enables mutual authentication by content transmission equipment.
		It was proposed by five companies (hence 5C), who are: Hitachi, Ltd., Intel Corporation, Matsushita Electric Industrial Co., Ltd., Sony Corporation, and Toshiba Corporation. http://www.dtcp.com.
		DTLA (Digital Transmission Licensing Administrator) is DTCP's licensing administrator. See also Copyright Protection Technical Working Group, Item 22.
		IBM, Intel, Matsushita and Toshiba have formed the "**4C Entity**" for Content Protection for Recordable Media and Pre-Recorded Media CPRM & CPPM. http://www.4centity.com/
27. **Digital Video Broadcast (DVB)**	Standards	The digital video broadcast is a consortium of over 300 manufacturers, research institutes, and broadcast organisations principally located in Europe but spread throughout the world. The Project has produced a series of interlinked broadcasting standards for satellite, cable and terrestrial. Through other European groups such as 'ACTS' the work is now going on to interlink computer networking and multimedia. www.dvb.org See other DVB standards and work listed below.
28. **Digital Video Interface (DVI)**	Video Interconnect Standard	Digital Video Interface is a high-speed digital connection standard to connect a PC (or digital TV STB), to a display device. As display technology moves away from the analog CRT type display to flat-panel and other displays that use digital processing, older analog interconnect standards, such as VGA, introduce further distortions by additional, unnecessary D/A and A/D conversions. The need for these conversions is removed by the introduction of this DVI standard.
		DVI is a much simpler standard than IEEE 1394 because it is only a point-to-point link – 1394 is a bus standard with protocols and such. Content protection and copy management for 1394 has been specified by 5C or DTCP (see Item 26), whereas HDCP (see Item 29), is proposed for DVI.
		Current maximum data rate of a single DVI link is 165 MHz RGB, transmitted as 3 serial digital streams of 1.65 Gbps each. Three different connectors for computer and consumer (home theatre) interconnects, are specified.
		The DVI standards was developed by the Digital Display Working Group, which includes companies such as Intel, Compaq, H-P, IBM and NEC. http://www.ddwg.org/
29. **Digital Visual Interface (DVI/HDCP)**	Content protection Standard	Digital Visual Interface (DVI) with high-bandwidth digital content protection (HDCP) for use on interconnects between set-top-boxes and television monitors for high definition video content. Initial supporters of the new protected digital interface are CableLabs®, DIRECTV, Inc., EchoStar's DISH Network, the Fox Entertainment Group, Satellite Broadcasting & Communications Association, Sony Pictures Entertainment, The Walt Disney Company, Thomson multimedia (NYSE: TMS) and Warner Bros. http://www.digital-cp.com/
30. **Dolby Suround Pro-Logic™**	Audio	A method of encoding rear 'surround' sound information in a 2-channel stereo audio signal. Some receivers have 'Pro-Logic™' enhancement to improve channel separation in the two rear loudspeakers. 'Pro-Logic II™ provides further improvements in the decoding process with greater channel separation and stereo surround, giving 5 channels..
31. **Dolby®**	Audio	A US based company specializing in proprietary compression and noise reduction techniques for audio transmission and recording.

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Term	Relevance	Description
32. **DOM - (Document Object Model)**	Internet & MHP – DVB-HTML	The Document Object Model is specified by the W3C in 3 Levels. Basically it is used for how objects in a (Web or DVB-HTML) page (text, images, headers, links, etc.) are represented. The DOM defines what attributes are associated with each object, and how the objects and attributes can be manipulated. It is a platform- and language-neutral interface that will allow programs and scripts to dynamically access and update the content, structure and style of documents. The document can be further processed and the results of that processing can be incorporated back into the presented page.
		DVB-HTML uses up to DOM Level 2 with some variants and seeks to have compatibility with Level 3 DOM key events – see Sect 8 of MHP Ver1.1 spec –ETSI TR 102 812.
		Note: "Dynamic HTML" (DHTML) is a term used by some vendors to describe the combination of HTML, style sheets and scripts that allows documents to be animated. It relies on the DOM to dynamically change the appearance of Web pages after they have been downloaded.
		The W3C's DOM specification supports both HTML and XML. (http://www.w3.org/DOM/)
33. **DSM-CC**	MPEG data carousel	Digital Storage Media - Command and Control : A cyclic data transmission protocol. The data is split into smaller "modules", which are then transmitted in a repetitive sequence – i.e. a carousel. If there are several modules to complete a single entity (or file) but a module is received with errors then the receiver may wait for subsequent resends to complete the entity.
		The DSM-CC download server is defined in ISO/IEC 13818-6 Section of the MPEG-2 standards. Most common use is for interactive applications or receiver software upgrades. It is similar to the carousel transmission of teletext pages.
34. **DVB-J**	MHP	The Java platform defined as part of the MHP specification – (from MHP)..
35. **DVB-J API**	MHP	One of the Java APIs standardised as part of the MHP specification – (from MHP).
36. **DVB-J Application**	MHP	A set of DVB-J classes that operate together and need to be signalled as a single instance to the Application Manager so that it is aware of its existence and can control its lifetime through a lifecycle interface – (from MHP)

Term	Relevance	Description
37. **DVB-T**	Transmission Standards	The DVB-T terrestrial digital television broadcasting specification is based on a radio transmission system using Coded Orthogonal Frequency Division Multiplexing, (COFDM), that has many (thousands) of closely and precisely spaced radio carriers, each separately modulated. In sum these carry packets of data that includes program material digitised to the MPEG specification, and other data (SI) relating to channel tuning, time and date and program guide information.
		The DVB-T system was based on a set of user requirements produced by the Terrestrial Commercial Module of the DVB Project. DVB members contributed to the technical development of DVB-T through the DTTV-SA (Digital Terrestrial Television—Systems Aspects) of the Technical Module. The European Projects SPECTRE, STERNE, HD-DIVINE, HDTVT, dTTb, and several other organizations, developed system hardware and produced results that were fed back to DTTV-SA.
		The DVB-T system specification for terrestrial digital television was approved by ETSI [European Telecommunications Standards Institute (document EN 300 744) http://www.etsi.org/broadcast/dvb.html]. MPEG-2 sound and vision coding forms the basis of DVB-T. Elements of the DVB-T specification include:
		• COFDM transmission, which allows for the use of either 1705 carriers (usually known as '2k'), or 6817 carriers ('8k'). Concatenated error correcting is used. The '2k' mode is suitable for single transmitter operation and for relatively small single frequency networks with limited transmitter power. The '8k' mode can be used both for single transmitter operation and for large area single frequency networks. To reduce the corruption from signal reflections or echoes (ghosting), the broadcaster can select and set in the transmission, a "guard interval" or period of time for the receiver to wait before demodulating each sample. The '8k' system can provide longer protection than the '2k' system.
		• Reed-Solomon outer coding and outer convolutional interleaving are used, in common with the other DVB standards.
		• The inner coding (punctured Convolutional Code) is the same as that used for DVB-S.
		• The data carriers in the COFDM frame can use QPSK and different levels of QAM modulation and code rates, in order to trade bit rate against ruggedness.
		• Two-level hierarchical channel coding and modulation can be used, but hierarchical source coding for video and audio is not used, since its benefits do not justify the extra receiver complexity involved.
		The modulation system uses OFDM (Orthogonal Frequency Division Multiplexing). OFDM uses a large number of carriers that spread the information content of the signal. Used very successfully in DAB (Digital Audio Broadcasting), OFDM's major advantage is that it maintains good reception characteristics in a very strong multipath environment.
38. **Dynamic range**	Signals	The ratio between the greatest signal power that may be transmitted over a multichannel analog transmission system without exceeding distortion or other performance limits, and the least signal power that may be utilized without exceeding noise, error rate or other performance limits.
39. **ECMA**	Standards	European Computer Manufacturers Association (http://www.ecma.ch/), is an international industry association founded in 1961 and dedicated to the standardization of information and communication systems, particularly in Europe.
40. **ECMAScript**	Web language	ECMAScript is an internationally standardized, general purpose, cross-platform programming language that can be used to provide scripting of events, objects, and actions. Prior to standardization, ECMAScript was known as Netscape JavaScript. ECMAScript + DOM 0 is equivalent to JavaScript 1.1.

Term	Relevance	Description
41. **EDTV**	TV Picture quality definition	Extended definition TV. Refers to mainly wide screen formats using the current scanning rates but not limited by bandwidth restrictions or artefacts of modulated PAL or NTSC; usually by full digital connection from camera to baseband input on the home receiver (component SCART/Peritel or S-Video connection). Also a widescreen format proposed by Fuji-TV in Japan.
42. **EICTA**	Euro Standards	As of 1 October 2001, **EICTA** merged its activities with **EACEM**, the European Association of Consumer Electronics Manufacturers. The new joint association is called EICTA - <u>European Information, Communications and Consumer Electronics Technology Industry Association</u>. It combines 45 major multinational companies as direct members and 28 national associations from 18 European countries. The new EICTA altogether represents more than 10.000 companies all over Europe with more than 1.5 million employees and revenues of over 190 billion Euro.
43. **Electronic Industries Alliance (EIA)**	Standards	A US voluntary body of manufacturers which, among other activities, prepares and publishes Standards. http://www.eia.org/tech/index.cfm
44. **Electronic Program Guide (EPG)**	Multimedia	An EPG implies a degree of electronic interactivity and navigation capability that is not possible in a static Program Guide.

Basic program schedule information is usually included as data in digital television broadcast formats. Broadcasters using DVB, transmit basic information in Event Information Tables (EIT) tables. These tables may be in several different forms containing immediate information - $EIT_{now/next}$, (also known as EIT_{pf} - present/following) and in limited cases, future program information, known as $EIT_{schedule}$, which may also include other broadcasters' program details. $EIT_{schedule}$ is not generally used however because there can be a significant amount of data but the DVB specification doesn't provide any means to compress this data to lessen the data bandwidth requirements.

Receivers usually display the $EIT_{now/next}$ data when a viewer changes program, and some receivers include an enhanced program guide where information is compiled from $EIT_{schedule}$ or captured if the viewer 'surfs' to other broadcasters' transmissions.

An EPG that provides interactivity and navigation facility requires the broadcaster(s) and receiver makers to nominate a suitable API/middleware - eg. MHP or OpenTV, Liberate etc.

The EPG data is continually updated in the broadcast and displayed in the receiver by an application that either may be downloaded (also received in the broadcast), or embedded in the non-volatile receiver memory – usually at time of manufacture. The disadvantage of an embedded application is the inability to change it later. The advantage of an EPG is the Broadcaster's ability to change the look and feel to suit changing requirements.

Other suppliers may provide EPGs, either through unrelated data streams or, perhaps, via modem or over the Internet, as is provided to TiVo subscribers in the US and UK.

Note that in Australia, the Broadcasting Services Act imposes certain obligations on broadcasters and datacasters in regard to EPGs. |
| 45. **European Telecommunication Standards Institute (ETSI)** | Standards | The major European Standards publishing body. http://www.etsi.org/

Standards are available for download (gratis), after registration from this site. |

Acronyms and Glossary of Terms Relating to
Interactive TV & Multimedia Home Platform (MHP)

Term	Relevance	Description
46. Execution engine	Interactivity	The part of a computing system that reacts to executable code such as machine language or in machine code being the native language a particular computer processor can follow directly. The source code of a programming language is either compiled directly into executable code or into an intermediate language.
		For example, C++ is compiled into executable machine code. Java source code is compiled into an intermediate bytecode language that must be turned into executable code at runtime by the Java Virtual Machine (JVM - See Item 70 Java) . Technically, the compiler creates object code, which is the machine language representation of the source code, and the link editor creates the executable code. The link editor combines program object code, object code from library routines and any other required system code into one addressable machine language file.
47. Font	Graphics - Typeface	Refers to a set of characters (eg. a – z, plus numbers, punctuation marks, etc.) in a particular aesthetic style. Derived from printing and typeface heritage, the modern definition is a member of a typeface family.
		Times New Roman Italic is a font or font file in the Times New Roman typeface family. **This Font is 9 point Times New Roman Bold**
		Point size is a typographic unit of measure. Traditionally there are 72.27 points to one inch (or 28.45 points to the cm). In the font formats of PostScript and TrueType there are 72.0 points to the inch.
		In video, a font is a mechanism that allows the specific rendering of a particular character to be specified – See also Tiresias (typeface/fonts) – Item 141, page 42 and Portable Font Resource (PFR) Item 106, page 36
48. Forward Error Correction (FEC)	Data Transmission	Mainly applicable to data systems where the data is available only once without any capability to access the original source. FEC methods improve the ability to recover error-free data, usually by adding extra data (about the payload data) before transmission or storage.
		The cost is a reduced payload in a given data bandwidth system.
		For example in DVB-T, a system of FEC referred to as 'Viterbi' or 'inner' coding can be set to different levels from 7/8 to 1/2 with 1/2 providing the most error protection but virtually reducing the payload by half.
		Another error protection system widely used (including DVB-T and some ASI systems), is known as Reed-Solomon (RS). This adds a further 16 bytes to the 188 Byte MPEG-2 transport stream packet making a new packet size of 204 bytes.
		This is different to simple 'error detection', which for example, in teletext is by adding to each 7-bit word, an extra single (odd) parity bit. In DVB each descriptor's data parcel is concluded with a 32bit 'CRC'.
49. Free-To-Air (eg. FTA-broadcaster)	Broadcast	FTA broadcasters offer their programs and related material, where receivable, to be freely accessed by the public. This contrasts with **subscription or pay** broadcasters that impose a charge on a viewer/listener to access their material. FTA broadcasters may be government, community or commercially (advertising) funded.
50. Free-to-View	Digital TV	It is possible that a service is free (i.e. no payment required) and clear (not scrambled/encrypted) on one platform, (eg. when carried on a terrestrial transmission system), but encryption may be involved, and a payment may be required, when carried by another system, (eg. satellite).
		Free-to-View is a term used to distinguish services that are broadcast in a scrambled/encrypted mode, but may be made accessible to viewers, listeners or other users without payment of a subscription charge.
		"Free-to-view" in the UK –see http://www.freetoview.co.uk
51. G703	Telecom data transmission standard	CCITT (ITU-T) Data Standard Recommendation.G.703 General aspects of digital transmission systems - Terminal Equipment. Physical/electrical characteristics of hierarchical digital interfaces using 75 ohm unbalanced or 120 ohm balanced interconnects.

Term	Relevance	Description
52. **Group of Pictures (GoP)**	MPEG Video	A sequence of data frames related to the original video frames commencing with a first frame (I-Frame) that is the most detailed (and consequently has the most data), followed by reduced data 'B' and/or 'P' frames. A GoP of 1 could be 'I' frames only, (similar to digital tape formats such as DVC-Pro50) or IB, IB, IB... (a GoP of 2 similar to Beta-SX format).
		For best quality at low data rates (eg. for broadcast), longer GoP lengths of 12 and 15 are used.
		MPEG1 and MPEG2 digital video compression schemes achieve their high degree of compression by relying on any sequence of video frames being very similar and thus only any changes from frame to frame being signalled - eg. any object that has moved or entered the scene if the camera is panned.
53. **HAVi**	Home Entertainment Systems Standard	Home Audio Video interoperability: HAVi is a home networking standard for interoperability between digital audio and video consumer devices. It is an initiative from eight major Consumer Electronics companies - Grundig AG, Hitachi, Ltd., Matsushita Electrical Industrial Co., Ltd. (Panasonic), Royal Philips Electronics, Sharp Corp., Sony Corp., Thomson Multimedia and Toshiba Corp. Parts of the HAVi specifications including 'user interface' have been included into the MHP. www.havi.org
54. **Header**	Data packet	In data transmission, the header is protocol control information located at the beginning of a protocol data unit.
55. **Hierarchical coding**	MPEG	Not used in DVB implementations. This is a technique intended to give the opportunity for various grades of receivers (decoders) only the resolution they require. For example a high resolution picture could be transmitted and a small hand-held PDA device could receive and display a low-resolution picture.
		It is a possible feature of MPEG-2 where the video and/or audio information can be coded and scaled spatially or temporally. That is where a base or course layer and a fine detail layer may be sent separately. For example, the Simple, Main, SNR Scalable, Spatially Scalable and High profiles have a hierarchical relationship. Therefore the syntax supported by a 'higher' profile includes all the syntactic elements of 'lower' profiles (e.g., for a given level, a Main profile decoder shall be able to decode a bitstream conforming to Simple profile restrictions). Refer ISO/IEC 13818, Parts 1 to 3.

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Term	Relevance	Description
56. Hierarchical COFDM modulation	Transmission ETSI 300 744, AS4933, AS4599	A feature of the DVB-T COFDM system is that radio-frequency transmissions may be configured in any one of several hundred possible modes to optimise the transmission for ghosting interference and/or extended distance coverage. In general, the transmission can be made less prone to interference and receivable in a wider range of locations, but at the expense of reduction of the data carrying capacity.
		However a group of transmission modes known as "hierarchical modulation" (HM), may provide much improved receivability for a proportion of the data without marginal loss of receivability of the remaining data transmission.
		Hierarchical modulation may offer viewers that don't have access to a good antenna system or are located in difficult or marginal reception areas, the ability to receive some of the services offered by a broadcaster, whereas the alternative may be none at all. The only alternative to a broadcaster is the installation of some remedial infrastructure like translators or gap-fillers but these may not offer much help to restricted reception encountered in urban high-rise.
		When operating in a Hierarchical Modulation mode, the data carrying capacity effectively is split into two parts – known as high and low priority. The high priority part can be received at greater distances or in more difficult reception locations than the low priority part, which has similar receivability characteristics to a standard non-hierarchical broadcast. Each part carries its own transport data stream and the sum of these two data streams is to close the capacity of a non-hierarchical transmission. Because there are 2 separate data streams there is a small data loss due to the need for each stream to have its own System Information (SI) tables.
		In technical terms, it is best understood by considering the COFDM constellation of possible modulated states in each of the four quadrants. The simplest, and most robust modulation is 4QAM (QPSK) with 16QAM and 64QAM as other less robust possibilities. If a case of QPSK is taken and say, a lower amplitude 16QAM signal (at a synchronous clock rate and same guard interval) added on top, then the constellation would have the appearance of 64QAM but the QPSK and 16QAM would each be carrying their own data (transport stream). The high priority stream is carried on the base QPSK modulation and usually protected by stronger FEC and/or a shift of the modulation pattern (alpha factor) by increasing the amplitude of the QPSK component. Another possibility is QPSK on QPSK, the resultant constellation then appearing as 16QAM.
		The high priority part of the COFDM transmission is capable of being more reliably received under difficult reception conditions such as in mobile or portable situations, whereas the low priority stream (if 16QAM), could have comparable receivability to standard 64QAM. Receivers with a single COFDM demodulator will need to select either the high priority stream or, if reception conditions allow, the low priority stream.
		With the 16QAM on QPSK case, the demodulated high priority stream typically has a data capacity of between one third and one quarter of the non-hierarchical signal while the low priority is about two thirds to one half. Refer to **ETSI EN 300 744** and AS 4599. This implies that in a 7MHz channel, typically 6 Mb/s and 14 Mb/s may be carried in each transport stream allowing SD in the high priority stream and a progressive format HD or SD and other combinations in the low priority stream.
		Hierarchical COFDM transmissions may be identified by the COFDM low data rate Transmission Parameter Signalling (TPS) or in the DVB-T NIT of the high priority QPSK stream. To assist receiver operation, each stream should also carry NIT$_{other}$ and SDT$_{other}$ with details about the other stream.

Acronyms and Glossary of Terms Relating to Digital TV Systems, DVB, Interactive TV & Multimedia Home Platform (MHP) <mark>Ver. 6.2</mark>

Term	Relevance	Description
57. High Definition Television (HDTV)	TV Picture quality	High definition television has a resolution of approximately twice that of standard television in both the horizontal (H) and vertical (V) dimensions and a wide screen picture aspect ratio (H:V) of 16:9. Rec ITU-R BT.1125 further defines 'HDTV quality' as the delivery of a television picture that is subjectively identical with the interlaced HDTV studio standard. For digital TV transmissions using MPEG-2, a receiver with a 'main profile at high level' (MP @ HL) MPEG decoder is required.
		Note that the number of TV "lines" alone does not give an indication of the perceived picture sharpness. Different types of display will affect the result. For example, it is generally agreed that a 720-line 'progressive' format display will have similar degree of sharpness in the vertical direction to a 1080 line 'interlace' format display.
58. HTML	Web language	HyperText Markup Language (RFC 1866), defines a simple method of giving layout to documents. It can be created with almost anything from a simple plain text editor - you type it in from scratch- to sophisticated WYSIWYG authoring tools. HTML uses tags such as \<h1\> and \</h1\> to structure text into headings, paragraphs, lists, hypertext links, graphics and multimedia.
		HTML is already overburdened with dozens of interesting but incompatible inventions from different manufacturers, because it provides only one way of describing your information. HTML is considered to be at the limit of its usefulness as a way of describing information, and while it will continue to play an important role for the content it currently represents, many new applications require a more robust and flexible infrastructure and are better contained in a XML format.
		Three versions of HTML have stabilized the explosion in functionalities of the Web's primary markup language. HTML 3.2 was published in January 1997, followed by HTML 4 (first published December 1997, revised April 1998, revised as HTML 4.01 December 1999). XHTML 1.0, which features the semantics of HTML 4 using the syntax of XML, became a Recommendation in January 2000
59. Hybrid Fibre/Coax (HFC) system	Cable TV	A broadband bi-directional shared-media transmission system using fibre trunks between the headend and the fibre nodes, and coaxial distribution from the fibre nodes to the customer locations.
60. Hyper-text-transfer protocol (http)	Internet	An Internet protocol for transferring text files with layout information.
61. IEEE 1394	Hi-speed Data transmission standard	Also known as 'FireWire' or i.Link^{TM}. A high-speed interconnect standard. Mainly used for consumer digital television applications. The so-called multimedia bus is unique in its ability to carry video and audio with assured quality, based on both its high bandwidth and isochronous ("time-sensitive") services. Products based on P1394a can communicate in a peer-to-peer fashion at 100, 200, or 400 Mbits/sec. A 4-wire and 6-wire version are in common use, with the 6-wire version also carrying DC power to the peripheral device. www.1394ta.org "Plug-&-Play" is supported and the standards is widely used for domestic high-speed digital interlinking of DV camcorders with PC editing computers and DTV receivers with recorders such as D-VHS.
		Program content protection and copy management has been added – see DTCP, Item 26.
62. Institute of Electrical and Electronic Engineers (IEEE)	Standards	An international non-profit, technical professional association that supports the publication of academic and professional journals and proceedings in more than 20 disciplines of computer engineering, biomedical technology and telecommunications, to electric power, aerospace and consumer electronics. www.ieee.org/
		It also sponsors Standards committees and is accredited by the American National Standards Institute. Various standards have become widely used such as IEEE 802 (Local area network Ethernet and Wi-Fi wireless Ethernet 802.11a & b), – and IEEE 1394 (FireWire/i.Link).

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Term	Relevance	Description
63. **International Electrotechnical Commission (IEC)**	Standards	The leading international organisation, based in Switzerland, that prepares and publishes international standards for all electrical, electronic and related technologies. These serve as a basis for national standardization and as references when drafting international tenders and contracts. http://www.iec.ch/
64. **International Organization for Standardization (ISO)**	Standards	A worldwide federation of national standards bodies organized to promote the development of standardization to facilitate the international exchange of goods and services, and to develop cooperation in the spheres of intellectual, scientific, technological and economic activity. The best known ISO standards are the ISO9000 series on quality management. www.iso.org/
65. **International Telecommunication Union— Radiocommunication (ITU-R)**	Standards	An international Standards body and a part of the ITU, based in Geneva which is the recognized Standards publisher for broadcast radio and television transmission standards and Standards on international program exchange. (Formerly known as the CCIR). http://www.itu.int/home/index.html, http://www.itu.int/ITU-R/
66. **Internet Engineering Task Force (IETF)**	Standards	A body of interested organizations responsible, among other things, for developing Standards used for the Internet. http://www.ietf.org/
67. **ISO/IEC JTC1**	Standards	This joint technical committee of the ISO and IEC covers international standardization in the field of Information Technology, including the specification, design and development of systems and tools dealing with the capture, representation, processing, security, transfer, interchange, presentation, management, organization, storage and retrieval of information. The MPEG development is within SubCommittee 29,WG11 of this body. http://www.jtc1.org/
68. **Java applet**	Software	A Java program that is downloaded and run from the browser. The Java Virtual Machine built into the browser is interpreting the instructions. Contrast with Java application
69. **Java application**	Software	A Java program that is run stand alone. The instructions are interpreted by the Java Virtual Machine in the receiver.
70. **Java ™**	Software	A programming language developed by Sun Microsystems (http://java.sun.com/), designed to generate applications that can run without modification, on many different hardware platforms. Java is an interpreted language. That is, the source code of a Java program is compiled into an intermediate language called bytecode, which cannot run by itself. The bytecode must be converted (interpreted) into machine code at runtime. Upon finding a Java applet, a browser invokes a Java interpreter (Java Virtual Machine -JVM), which translates the bytecode into machine code and runs it. This means Java programs are not dependent on any specific hardware and will run in any computer with the Java Virtual Machine software. While being modelled after the C++ computer language, Java was designed to run in small amounts of memory and provides enhanced features for the programmer, including te ability to release memory when no longer required. This automatic "tidying up" feature has been lacking in C and C++ and has been the bane of programmers for years. Java's "write once-run anywhere" model has been one of the Holy Grails of computing for decades. However, a problem for consumer equipment is that an extra layer of translation is required to execute an interpreted language. That requires more time for a result, or a faster processor. JavaTV is divided into 'packages' such as javax.tv.service.navigation which then relate to 'classes' such as javax.tv.service.navigation.ServiceType Like other programming languages, Java is royalty free to developers for writing applications. However, the Java Virtual Machine, which executes Java applications, is licensed to the companies that incorporate it in their browsers, Web servers and DTVs (for MHP).

Term	Relevance	Description
71. JavaScript	Software	A scripting language that uses a similar syntax as Java. It is not compiled into bytecode, but remains in source code contained in an HTML document. When received, it must be translated a line at time, into machine code by the JavaScript interpreter, a software program running in the browser. JavaScript is very popular and is supported by all Web browsers.
		JavaScript has a more limited scope than Java and primarily deals with the elements on the displayed page itself. JavaScript is endorsed by a number of software companies and is an open language that anyone can use without purchasing a license.
72. Latency	System performance	The time for material to be passed from the input to the output of a system.
73. Lifetime	interactive DTV	The lifetime of an (MHP) application characterizes the time from which the application if Loaded to the time the application is Destroyed – (from MHP)

Term	Relevance	Description
74. Local Area Network (LAN) & Wi-Fi	Computer hardware standards	A non-public data network in which serial transmission is used for direct data communication among data stations located on the user's premises.
		A number of wired LAN systems have been developed for computer networks including IBM's Token Ring, Arcnet, Apple's 'Apple Talk' but the **IEEE 802**.3 (Ethernet) has become the defacto preference and most widely used with a backward compatible advances resulting in a suite of standards, such as 10baseT (10Mbps), 100baseT, (100Mbps) and now Gigabit Ethernet for wired systems.
		A wireless LAN link does not require lining up devices like line-of-sight infra-red links (IrDA commonly found on notebook PCs), but allow 'roaming' within a given range omnidirectional radio waves that can transmit through walls and other non-metal barriers.
		Two-way radio-linked data LANs have been developed with the most common using variants of the IEEE 802 standard.
		802.11b operates at 2.4GHz with throughput of typically 5Mbps. This has become known as "**Wi-Fi**" and is now expanded to include the 5GHz, IEEE **802.11a** standard with throughputs of about 60Mbps.
		802.11g also uses 2.4GHz but with increased payload. The range of Wi-Fi is typically 100 metres but can be extended by high gain directional antennas with ranges reported in excess of 2km. The very low range (<10m) 'Bluetooth' standard (developed by Ericsson – see below), is different as it is low data rate intended for wireless connections application such as mobile phone to personal earpiece/microphone set.
		The Wi-Fi® Alliance (http://www.weca.net/OpenSection/index.asp) is a nonprofit international association formed in 1999 to certify interoperability of wireless Local Area Network products based on IEEE 802.11x specification. (See also http://www.wi-fizone.org/)
		Short distance wireless networks a.k.a. **WPAN** ™ or Wireless Personal Area Network serve only small workgroups down to a single person with limited range and do not support roaming. These include **Bluetooth** and IEEE **802.15**, which is concerned with interoperability between wireless LANs (802.11) and WPANs. They are typically used to transfer data between a laptop or PDA and a desktop machine or server as well as to a printer. Similar to the way a cordless phone works with its base station, technologies such as Bluetooth and HomeRF are expected to be deployed in dual mode smart phones that can download e-mail and Web data while on the road and then exchange that data with a laptop or desktop machine in the office. and wireless LAN.
		Bluetooth Special Interest Group (www.bluetooth.com) founded in 1998 by Ericsson, IBM, Intel, Nokia and Toshiba. Bluetooth is an open standard for short-range transmission of digital voice and data between mobile devices (laptops, PDAs, phones) and desktop devices. It supports point-to-point and multipoint applications.
		Bluetooth provides up to 720 Kbps data transfer within a range of 10 meters and up to 100 meters with a power boost. Bluetooth transmits in the unlicensed 2.4GHz band and uses a frequency hopping spread spectrum technique that changes its signal 1600 times per second. If there is interference from other devices, the transmission does not stop, but its speed is downgraded.
		Ericsson (a Scandinavian company) was the first to develop Bluetooth. The name comes from Danish King Harald Blatan (Bluetooth) who in the 10th century began to Christianize the country.
75. Macroblocking	Video Compression	Macroblocking refers to 'blockiness' seen in MPEG and JPEG encoded pictures usually due to too much compression and too low a data rate. When macroblocking gets severe enough that chroma information starts to get lost, it is called "pixelization". Also the veil-like shimmer that can appear around a slowly moving object is "mosquitoing" or "netting" - either way it looks like the object is wearing a mosquito net (see Item 81 Mosquito Noise). Bright objects placed against dark backgrounds (such as a face), can lose some edge definition (hence "bearding" or "tearing").

Term	Relevance	Description
76. MIB	DVB-T Measurement	Management Information Base: Defined for structured monitoring in SNMP applications with an Object Identifier (OID) so that a browser may go to the appropriate level. An organisational system that defines operational processes or information into tree structure with layers, for separation of function or application. Refer to ETSI TR 101 290.
77. Middleware	DTV receiver software	In an iDTV receiver or STB, 'middleware' is software that runs on 'top' the receiver's basic operating system (OS), similar to the familiar MS Windows that operates on a PC's start-up OS. It provides an environment to run the various application software. Examples of set-top middleware are MHP, OpenTV and Liberate.
78. Modified Julian Date (MJD)	DVB & computer date & time	Used in DVB transmissions. A day numbering system (based on the Western Julian Calendar), used for computers and in DVB as a way of conveying dates just as a relatively unambiguous number. The starting date is midnight on 17 November 1858.
		The earlier Julian date System started on noon on 1 January 4713 B.C. (Julian Day zero), which is 2,400,000.5 days earlier.
		Annex C of ETSI document **EN 300 468** 'Specification for Service Information in DVB Systems' shows how to convert between MJD and Year, Month, Day values. See also Item 140 Time and Date Notation.
79. Modulation Error Ratio (MER)	DVB-T reception measurement	MER is intended to provide a single "figure of merit" analysis of the DTV received signal. It's computed to include the total signal degradation likely to be present at the input of a commercial receiver's data decoding decision circuits to give an indication of the ability of that receiver to correctly decode the signal.
		For terrestrial DVB applications the 'technical report' from DVB/ETSI **TR 101 290** (V1.2.1 May 2001) describes the basis of this and other measurements of importance to DVB and MPEG systems. TR 101 290 also notes that MER is closely related to another "figure of merit" calculation known as Error Vector Magnitude (EVM).
80. Mosaic display	Display	An array of small pictures to make a total full-screen picture. Generally provided to give an indication of the content of a number of video programs.
81. Mosquito Noise	Video Compression artefact	Visible effect in MPEG encoded picture around the edge of higher contrast parts of the image. So-called as it looks like swarming mosquitos.
		Usually due to poor encoding and insufficient data rate. (See also Item 75 Macroblocking).
82. Moving Picture Experts Group (MPEG)	Standards	A voluntary body known as ISO/IEC Joint Technical Committee 1, Sub Committee 29/Working Group 11 (ISO/IEC JTC1/SC29/WG11), which has and continues to develop Standards for digital compressed moving pictures and associated audio. MPEG Standards are published in the **ISO/IEC 11172** (MPEG-1), and **ISO/IEC 13818** (MPEG-2) series of documents. Current work in MPEG includes MPEG-4, which addresses coding and distribution of multimedia objects, and MPEG-7 which defines a multimedia content description interface, for indexing and searching of multimedia information. http://www.cselt.it/mpeg/
		Interoperability of MPEG compression systems in the professional production of professional television equipment working according to open coding standards and internationally standardised interfaces for video, audio and metadata is promoted by the **Pro-MPEG Forum** www.pro-mpeg.org/

Term	Relevance	Description
83. MPEG- 1 and MPEG- 2	Standards	Also refer to entry under 'Moving Pictures Experts Group (MPEG). http://www.cselt.it/mpeg/ These are the most common video and audio compression schemes now in use. MPEG-1 was used for lower data rate video on early CDi and VideoCDs.
		MPEG-2 provides for better quality (at higher data rates) and is used in a variety of professional and consumer applications from SDTV to HDTV on terrestrial, satellite and cable broadcast and digital video (Versatile) disks.
		MPEG's success has been in that the standard defines the decoder, not the encoder. This has enabled encoder designers to achieve improvements over time and experience. For example, for a given quality of picture compressed by MPEG-2, the bit rate needed has been reduced to about 2/3 since the specification was finalised in 1994/5.
		MPEG video coding is defined in various "profiles" and "levels" of quality with a range of line and frame rates. 3 aspect ratios can be used. Distribution quality colour coding of 4:2:0 is normal but contribution quality of 4:2:2 has been added in 'Addendums'.
		Source Input Format (SIF), with 352 pixels x 240 lines x 30 frames/sec, is also known as Low Level (LL),
		MPEG-1: **ISO/IEC 11172** (all parts), Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbit/s
		MPEG-2: **ISO/IEC 13818** (also known as **ITU-R H.262**), Information technology — Generic coding of moving pictures and associated audio information in 10 sections and Addendums and Corrigenda
		Part 1 - Systems Part 2 - Video Part 3 - Audio Part 4 - Compliance testing Part 5 - Simulation software Part 6 - Digital storage media command and control (DSMCC) Part 7 - Non-backwards compatible audio Part 8 - 10 bit video extension Part 9 - Real-time interface
84. MPEG- 1 layer II audio	Standards	The compressed audio Standards of MPEG-1 were published in the 1993 International Standard **ISO/IEC 11172-3**. This dealt with mono and two-channel stereo sound coding, at sampling frequencies commonly used for high quality audio (48, 44.1 and 32 kHz). Compared to Layer I, Layer II is able to remove more of the signal redundancy and to apply the psychoacoustic threshold more efficiently.
		MP3 There is also a Layer III, known as MP3, which is again more complex and is directed towards lower bit rate applications due to the additional redundancy and irrelevancy extraction from enhanced frequency resolution in its filterbank.
		A 'full Layer II' decoder accepts Layer I and II bitstreams. Likewise an MPEG-2 decoder should be capable of fully compatible decoding an MPEG-1 bitstream. The development of audio standards for MPEG-2 resulted in the 1995 International Standard **ISO/IEC 13818-3**.
		For more details on **Stereo** modes see Item 136 Stereo & Joint Stereo (for MPEG), and for audio compression see also Item 3 Advanced Audio Coding (AAC), as used in MPEG-4.

Term	Relevance	Description
85. MPEG- 4	Compression Standards	A more advanced way of encoding and video, audio and other material principally using object coding techniques. MPEG-4's language for describing and dynamically changing the scene is named the Binary Format for Scenes (BIFS). http://www.cselt.it/ufv/leonardo/mpeg/index.htm
		MPEG-4 has the possibility to encode SD and HD television program material at compression ratios with, typically, from 2 ~ 6 times improvement over MPEG-2 for comparable picture quality. Early examples of MPEG-4 like compression are used in Apple 'Quicktime', DIVx, Real and Microsoft Windows Media-9 codecs.
		The MPEG-4 Standard is ISO/IEC 14496 (obtainable from www.iso.ch/ittf) while the ITU version is known as H.264 (similar to MPEG-2/H.262)
		Information is available from the MPEG-4 Industry Forum, M4IF, http://www.m4if.org/
		ITU/ISO/IEC Joint Video Team (JVT) and with ISO/IEC JTC1/SC29/WG11 (MPEG) JVT Coding ITU-T H.26L; ISO MPEG-4, Part 10 In December 2001 the Joint Video Team (JVT) was formed from VCEG and MPEG to finalize H.26L as a joint project.
		The video coding is generally teamed with an improved Advanced Audio Coding (AAC).
86. MPEG- 7	Standards for Classifying and Locating Multimedia Material	MPEG-7 aka "Multimedia Content Description Interface" (http://www.mpeg-industry.com/), has standardized description schemes for content description, management, and organization, as well as navigation, access, user preferences and usage history. These multimedia descriptions could be used in the following types of applications:

For MPEG-7 the applications list:

- Search Engines, Digital Libraries, Broadcast Networks, Entertainment and News Distributors, Streaming Businesses

- Dynamic start-up companies, searching for cutting edge technologies.

- Governmental, Educational, Law, Medical & Remedial Services, and Non-profit organizations looking for digital media solutions.
  (For example, the U.S. Library of Congress receives over 10,000 multimedia items each week. There is a commitment to the long term preservation of these items in digital format, and making much of their collection more accessible.)

- XML, Metadata, Modelling/Simulation, & Surveillance Industries

- AI Practitioners, Content Creators and Providers.

Standard: ISO/IEC 15938-1, Information technology -
Multimedia content description interface -

Part 1 – Systems: specifies the tools for preparing descriptions for efficient transport and storage, compressing descriptions, and allowing synchronization between content and descriptions.

Part 2 – Description definition language: specifies the language for defining the standard set of description tools (DSs, Ds, and datatypes) and for defining new description tools.

Part 3 – Visual: specifies the description tools related to visual content.

Part 4 – Audio: specifies the description tools related to audio content.

Part 5 – Multimedia description schemes: specifies the generic description tools related to multimedia including audio and visual content.

Part 6 – Reference software: provides a software implementation of the standard.

Part 7 – Conformance testing: specifies the guidelines and procedures for testing conformance of implementations of the standard.

Part 8 – Extraction and use of MPEG-7 descriptions: provides guidelines and examples of the extraction and use of descriptions.

Acronyms and Glossary of Terms Relating to
Interactive TV & Multimedia Home Platform (MHP)

Term	Relevance	Description
87. **MPEG LA ◌**	Intellectual property rights	MPEG LA® (Licence Administration) provides one-stop technology standards licensing, starting with a portfolio of essential patents for the international digital video compression standard known as MPEG-2, which it began licensing in 1997. This licensing method enables widespread technological implementation, interoperability and use of fundamental broad-based technologies covered by many patents owned by many different patent holders. MPEG LA® provides users with fair, reasonable, nondiscriminatory access to these essential patents on a worldwide basis under a single license.
		The MPEG-2 Patent Portfolio License now has more than 290 licensees and includes more than 300 MPEG-2 essential patents in 29 countries owned by 17 patent holders. As the legal and business template for one-stop technology standards licensing, MPEG LA® also provides an innovative way to achieve fair, reasonable, nondiscriminatory access to patent rights for other technology standards - the high-speed transfer digital interconnect standard known as IEEE 1394 and now the terrestrial digital television standard used in Europe and Asia known as DVB-T. In addition, MPEG LA® has been asked to facilitate the development of joint licenses for MPEG-4 and other emerging technologies. The company is based in Denver, CO and has offices in Washington DC, San Francisco and London.
		Also refer to DVB's Licence Administrator http://www.dvbla.com
88. **MPEG-21**	Multimedia Standards & Intellectual Property Rights Management	Work on the new standard MPEG-21 "Multimedia Framework" started in June 2000. It aims to enable transparent and augmented use of multimedia resources across a wide range of networks and devices used by different communities. The 'big picture' is to describe how the specification of all the elements, which exist to build an infrastructure for the delivery and consumption of multimedia content. Six key technical elements have been defined in MPEG-21:
		Digital Item Declaration (DID, now in FCD stage), Digital Item Identification and Description (DIID, now in CD stage, Intellectual Property Management and Protection (IPMP) Architecture (now in CD stage [5]), Rights Expression Language (REL, now in WD stage), Rights Data Dictionary (RDD, now in WD stage), Digital Item Adaptation (now first CFP).
		Work is proceeding on "Digital Item Declaration" and "Digital Item Identification and Description". http://www.cselt.it/mpeg/standards/mpeg-21/mpeg-21.htm
		Digital Item Processing as part of the MPEG-21 multimedia framework. MPEG has identified several components within Digital Item Processing: Digital Item Methods (DIMs), Digital Item Method Engine (DIME), Digital Item Base Operations (DIBO) and Digital Item Method Language (DIML).
89. **MUD**	Data	Multi-User Dungeon or Dimension. A usually text-based, multi-user simulation environment. Some are purely for fun and game playing, while others are used for serious software development, education purposes, and all that lies in between. A significant feature of most MUDs is that users can create things that stay after they leave and which other users can interact with in their absence, thus allowing a 'world' to be built gradually and collectively
90. **Multimedia and Hypermedia information coding Expert Group (MHEG)**	Standards	Multimedia and Hypermedia information coding Expert Group:
		The Standard known as MHEG-5 is ISO/IEC IS 13522-5 (1996): "Information technology - Coding of Multimedia and Hypermedia Information - Part 5: Support for Base-Level Interactive Applications". This standard has been adopted by UK terrestrial broadcasters.

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Acronyms and Glossary of Terms Relating to Digital TV Systems, DVB, Interactive TV & Multimedia Home Platform (MHP) <mark>Ver. 6.2</mark>

Term	Relevance	Description
91. **Multimedia Home Platform (MHP)**	Interactive digital TV Standards	The Multimedia Home Platform (MHP) defines a generic interface between interactive digital applications and the terminals (eg STBs, iDTV receivers) on which those applications execute. This interface decouples different provider's applications from the specific hardware and software details of different MHP terminal implementations. It enables digital content providers to address all types of terminals ranging from low-end to high-end set top boxes, integrated digital TV sets and multimedia PCs. The MHP extends the existing, DVB open standards for broadcast and interactive services in all transmission networks including satellite, cable, terrestrial and microwave systems. Elements of the MHP specification include the DVB-J platform with DVB defined APIs and selected parts from existing **Java** APIs, JavaTV, HAVi (user interface) and DAVIC APIs. MHP standards are published by ETSI - MHP Specification 1.0 is TS 101 812 including corrigenda is actually Spec 1.0.2 MHP Specification 1.1 which adds a number of features such as access to 'SmartCard's and Internet access with optional DVB-HTML support is found in TS 102 812 V1.1.1 (2001-11) http://www.mhp.org/
92. **Multiplexer (Mux)**	data transmission equipment	A physical device that is capable of inserting/extracting video, audio, data into/out of an MPEG-2 transport stream. Statistical Multiplexer – see VBR 43, 148
93. **Multiview display**	A type of service use for digital TV	Additional video programs relating to a main program. The additional video may be from other (fixed or switched) point-of-view cameras or simply graphical and text information such as a sporting event statistics. These additional picture sources may be similar or lesser formats to the main program and may be displayed full screen or in advanced receivers in a PIP type window.
94. **National Television Systems Committee (NTSC)**	US Analog Color TV System Standards	A US committee formed in the late 1940s and '50s, which defined the analog colour television broadcast standard used today in North America, Mexico, Japan & Sth Korea. Standard published by EIA as RS-170A. Total of 525lines and nominally 60 field/s interlaced, 30 frame per second Total active picture lines 483 reduced to 480 for digital.. 60 fields/sec originally selected to be same as US mains power frequency but now after color introduced, reduced by 0.1% to 59.94 f/s to reduce interference to 3.58MHz color subcarrier on over-the-air broadcasts with sound FM subcarrier at 4.5 MHz. 59.94f/s causes problems with editing time-code, which required some frame numbers to be dropped to keep proper time – 'drop-frame'. In digital systems, the number of lines in active-picture is 480.
95. **On-Screen Display (OSD)**	TV receivers & computer displays	On screen display of menu for user's setup of receiver's operating parameters. Also refers to display of choices and interaction with receiver and/or program.
96. **Open Architecture**	Standards	A hardware or software designs with specifications that are public. This includes any system architecture the specifications of which may be published by a standards organisation or even privately designed architectures whose specifications are made public by the designers. The great advantage of open architectures is that anyone can design add-on products for it. By making an architecture public, however, a manufacturer allows others to duplicate its product. Linux, for example, is considered open architecture because its source code is available to the public for free. The opposite of open is closed or proprietary. The fact that a system architecture is open does not imply however that it or parts of it, may be intellectual property or royalty free.

Term	Relevance	Description
97. Opportunistic data	MPEG-2 & SMPTE Data standard	Data inserted into the remaining available bandwidth in a given transport stream after all necessary bits have been allocated for video and audio services. The data is sent in the first available space but it is non-deterministic, that is there's no guarantee when the data will be sent or how long it will take to send a complete file.
		The SMPTE's standard, **SMPTE 325M**, could be used to govern the implementation of flow control mechanisms for opportunistic data within MPEG-2 broadcast systems. This is a "request and wait" protocol, which typically could be implemented in a transmission multiplexer. Normally this would insert 'Null-packet' data if required to maintain its internal buffer. But if it sends a SMPTE 325M packet request to the opportunistic data server, those null-packets could be replaced by the opportunistic data. The number of packets required is conveyed within the packet request message. These flow control messages are formatted as DSM-CC sections encapsulated within MPEG-2 transport packets. Some of the ways that SMPTE 325M packets may be linked from the data server are: for high bandwidth and low latency messaging – an MPEG-2 transport stream on DVB-ASI or SDTI; or, either TCP or UDP on Ethernet may be used.
		Such systems would also probably need to modify the transport stream's PAT to include the PIDs of the data packets to advise receivers.
98. Orthogonal Frequency Division Multiplexing (OFDM)	Digital data broadcast method	A modulation system which uses a very large number of separate radio frequency carriers each of which carries a small proportion of the total information content to be sent. Also used in Digital Audio Broadcasting (DAB), OFDM has good performance in a very strong multipath (ghosting) environment. DVB based digital television broadcasts use Coded OFDM.
99. OS	Data	Operating System. The basic software that makes a computer run. An OS schedules tasks, allocates storage, handles the interface to peripheral hardware and presents a default interface to the user when no application program is running
100. Packet Identifier (PID)	data packet structure	A unique integer value used to identify elementary streams of a program in a single- or multi-program MPEG-2 stream. Carried within each 4byte packet header (13 bits).
101. Packetised Elementary Stream packet (PES packet)	data packet structure	The data structure used to carry elementary stream data. A variable length packet beginning with a PES packet header followed by a number of contiguous bytes from one elementary stream.
102. Personal Computer Memory Card International Association (PCMCIA)	Computer Standards Also DVB CI	Also known as PC card. A card/socket with 68 pins commonly found on notebook computers, digital cameras and in digital TVs for expanded facilities. Three types are defined – Type I, Type II and Type III. The thinnest (3.3 mm thick) are Type I, which are primarily used for memory devices like flash ram. Type II cards are the type normally used in digital TV applications and the card may have a 'SmartCard' slot inbuilt.
		Type II are 5mm thick. Common examples are modems and LAN adapters in PCs. This is also used by DVB's 'Common Interface' (CI) socket on DTV receivers to add additional facilities such as a 'Conditional Access' (CA) system or memory upgrade or for access to upgrade the receiver's embedded (flash) software,
		Type III cards are 10.5 mm and are used for the devices that require more space such as disk drives and wireless communication devices.
103. PES stream	MPEG data	A PES stream consists of PES packets, containing only data from a single elementary stream, and which all have the same stream_id as defined in ISO/IEC 13818-1. It is not use in DVB specified environments.

Term	Relevance	Description
104. Phase Alternate Line (PAL)	Colour Video Standards	An analog encoding system for colour television. Compatible with analog monochrome systems of the same scanning rates. It was developed by AEG Telefunken Laboratories in Hanover, Germany, principally by Dr Walter Bruch. Used in Europe, parts of Asia and Australia at 625line/50 and in Brazil at 525line/60. Broadcasting commenced in UK (PAL-I on UHF), in Sept 1967 and Australia (PAL-B) in March 1975.
		For 625 line systems 50 fields per sec interlaced, (25 pictures per sec), only 576 lines compose the actual picture information, the remainder being included as the Vertical Blanking Interval (VBI), (see Item 149).
		PAL uses a subcarrier modulated by two colour component signals (U & V), similar to the principles used in NTSC but alternates the phase of one of the colour signals (V), so that the receiver may correct colour errors by adding and subtracting the colour signals on subsequent lines with a delay line. The vector combination of the U and the V subcarriers results in a single subcarrier signal where the phase of the subcarrier relays the hue (spectral colour) and the amplitude (length of the vector), the depth or 'saturation' of the colour.
		The colour subcarrier at 4,433,618.75Hz (4.43MHz for 625/50) is a fixed relationship to the picture line frequency to reduce the visibility of the subcarrier in the picture. The carrier modulation is 'double-sideband, suppressed carrier', so if there is no colour in a particular part of a picture – eg. black, grey or white, then there is no subcarrier, further reducing visible artefacts.
		The system includes a short 'burst' of colour subcarrier in the back-porch of the horizontal blanking period to synchronise a receiver's colour decoder. This 'colour burst' is shifted in phase on alternate lines from 135º to 225º which also tells the receiver the phase of the 'V' signal.
105. Picture-In-Picture (PIP)	Video feature	A feature of some television receivers (usually with more than one tuner) to display video from other programs. Usually displayed as a smaller window. PIP may also become useful for the display of 'multiview' video, from digital program sources with this optional available.
106. Portable Font Resource (PFR)	Used in MHP	A compact, platform-independent format for representing scalable outline fonts, as used in MHP (see also Fonts - Item 47, page 23). The PFR format can provide a very memory efficient font download mechanism. Tests have shown that the combination of ASCII data plus the scalable PFR data can be more memory efficient that an equivalent GIF or PNG image with the text coded as a graphic.
		Bitstream own the intellectual property for the PFR technology, and the technology has been further commercialised as the TrueDoc format. This is available for use on the Internet (although its adoption is not widespread). The decoding of PFR fonts is built into Netscape Navigator and a free plug-in is available for Internet Explorer.
		The original specification was published in DAVIC Version 1.4.1, Part 9, Annex A. The current specification is published on the Bitstream web site, and is Version 1.1, dated 27th November 2000.
107. Portable Network Graphics (PNG)	Graphics	An extensible file format for the loss-less, portable, well-compressed storage of raster images. PNG provides a patent-free replacement for GIF and can also replace many common uses of TIFF. Indexed-color, grayscale, and truecolor images are supported, plus an optional alpha channel for transparency. Sample depths range from 1 to 16 bits. The PNG specification was issued as a W3C Recommendation on 1st October, 1996 http://www.w3.org/TR/REC-png.html
108. Presentation engine	Software operation	A part of a receiver hardware and/or software that processes and presents declarative applications consisting of content, such as audio, video, graphics, and text; primarily based on presentation rules defined in the presentation engine. It may also respond to formatting information associated with the content; to script statements, which controls presentation behaviour and initiate other processes in response to user input. For example, an HTML browser is a type of presentation engine (it's actually a software application) that displays text and graphic content formatted in HTML.

Acronyms and Glossary of Terms Relating to
Interactive TV & Multimedia Home Platform (MHP)

Term	Relevance	Description
109. **Presentation Time Stamp (PTS)**	MPEG	Used to synchronise the 'presentation' (display) of decoded material. In MPEG, dependant on the GOP length there can be near a second of delay in decoding – DTSs and PTSs should be used by a receiver's decoder to align say, picture and sound on the output. The field size for PTS (33 bits) was chosen so they would not wrap (i.e. return to the same number), in a 24-hour period. The DTS (decoding time stamp) is similar. See also PCR.
110. **Procedural application**	Used in MHP	Makes use of procedural information to express its behaviour – eg. a Java program. See also "declarative application".
111. **Profile**		Two possible meanings of "profile" within the context of IDTV have been discussed within international forums: a) A "design point", i.e. a collection of system attributes that characterizes a legitimate market segment of receiver. A design point indicates that a compliant receiver is capable of running a particular application, if resources permit. b) A guarantee of receiver resources and capabilities available to an application. Such a profile indicates that a compliant receiver will run a particular application. Within the standards community, meaning a) appears to be the more useful although qualifying alternatives to the use of "profile" are preferred. The MHP definition is: A description of a series of minimum configurations, defined as part of the specification, providing different capabilities of the MHP. It maps a set of functions that characterise the scope of service options. The number of profiles is small. The mapping of functions into resources and subsequently into hardware entities is out of the scope of the specification and is left to manufacturers.
112. **Program**		A collection of coded audio and/or coded video and perhaps other data objects such as caption data. Such objects need not have a defined time base; however, those that do, refer to a common time base for presentation synchronization. In DVB and MPEG terminology such things are described as a 'service' which is a sequence of 'events' each having a start time and duration.
113. **Program Association Table (PAT)**	DTV MPEG	A part of a DVB/MPEG transport stream. The PAT lists all the Program Map Table (PMT) information for services that are contained within a single digital MPEG transport stream. It is like a master list of services/programs.
114. **Program Clock Reference (PCR)**	MPEG	A signal transmitted typically 25 times a second to allow synchronisation of a decoder's system clock (usually 27MHz) to the original MPEG encoder 'clock'. Decoders may also use it with 'Presentation Time Stamps' (PTS) included with the video and audio to ensure the correct presentation of picture and sound (lip-sync).
115. **Program Map Table (PMT)**	DTV	A part of a DVB/MPEG transport stream. For each service in a transport stream there is an associated Program Map Table (PMT). The PMT has to be associated with a program number - known as service_id in the DVB SI. The PMT holds information about the content of a specific service. This includes pointers to the elementary streams that contain the audio, video and other parts included in that service including, for MHP applications, the Application Information Table (AIT).
116. **Program Stream (PS)**		In MPEG-2, a multiplex consisting of a concatenation of variable length PES packets, plus additional system information. Each PES packet carries coded audio, video, or data of one elementary stream. The program stream carries elementary streams of one program having a common time-base.
117. **Program-Specific Information (PSI)**		In MPEG-2, normative data necessary for the demultiplexing of transport streams and the successful regeneration of programs.
118. **Protocol**		A set of rules and formats which determines the communication behaviour of layer entities in the performance of the layer functions.

Term	Relevance	Description
119. Push & Pull		Pull refers to delivering content to a user upon request. Web browsing is considered "pull".
		Push refers to delivering content to a user. This may be regardless of user interest or in a previously indicated general field of interest. The user chooses what to view without controlling what is sent. Broadcast television is considered "push".
120. Quadrature Amplitude Modulation (QAM)		A method of modulating digital signals onto a radio-frequency carrier signal involving both amplitude and phase coding.
121. Quadrature Phase-Shift Keying (QPSK)		A method of modulating digital signals onto a radio-frequency carrier signal using four phase states to code two digital bits.
122. Red, Green, Blue (RGB)	Colour TV	Red, Green, Blue are the 'additive' colour primaries used in colour television. (Subtractive processes, such as printing use opposite primaries CMYK - Cyan Magenta Yellow blacK).
		Red, Green, Blue have been chosen to match the physiology of the human eye where the colour receptors, the cones, are most sensitive at these three points in the visible spectrum. Consequently the eye can be fooled into seeing yellow by a fine mixture of red and green dots on a TV picture tube.
		The picture information is linearly represented by red, green, and blue tristimulus values (RGB) lying in the range of 0% (reference black) to 100% (reference white). RGB signals are found internally in cameras and display devices, and very high grade graphics or electronic cinema work, but rarely otherwise.
		For all other applications RGB signals are converted (mathematically matrixed), into three other signals which are essentially the monochrome picture (Y) and two colour difference signals (R-Y & B-Y).
		This is done for a number of reasons including legacy, optimising transmission and masking noise and distortion effects.
		The "Y" part is the luminance also known as monochrome or black and white component. The Y signal always ranges between 0 (black) and 100% (white) with intermediate values being shades of grey.
		Nominally for standard definition (PAL), Y= 30% R + 59% G + 11% B.
		But for HDTV colorimetry, **ITU-R BT.709** specifies nominally for high definition (1080line), Y= 21% R + 72% G + 7% B.
		The most common occurrence of analog RGB signals is in consumer television equipment with 'Scart' connectors (see item 125) and computer 'VGA' connectors. See also Y, Pb, Pr connectors – item 156).
123. Return Channel (RC)	DTV	Also known as a **Back-Channel**, it's defined by MHP as "the communications mechanism (path), which provides connection between the MHP and a remote server. The connection could be via dial-up PSTN, a continuous Internet connection such as ADSL, cable-modem or a cable STB RC, or a wireless system such as **DVB's RCT** (**ETSI EN 301 958 V1.1.1 (2001-12)**. In cable systems, equivalent to an upstream path.
124. Sandbox	Java	The boundary or "context" to which an application may be contained.

Term	Relevance	Description
125. SCART plug	Hardware	Large flat multi-pin plug-socket usually found on larger domestic TVs and European VCRs for modular interconnect. A mandatory requirement for TV equipment sold in Europe. It includes video and audio inputs and outputs as well as wide-screen signalling - all into a single interconnect cable. There are several configurations depending on whether the socket is intended to go to a VCR or TV set.
		The video connections are normally high quality RGB component and/or S-Video, although some manufacturers may only provide composite PAL video. Some manufacturers enable users to change the type of output through a "set-up menu."
		Component video interconnection is preferred to bypass the resolution loss and artefacts caused by composite PAL. (Also known as Peritel peripheral television interconnect or Euroconnector.
		Outside Europe and in the USA, a 3-lead Y, Pb, Pr component video interconnect with separate audio leads, is preferred.)
126. Serial Digital Interface (SDI)		Single coaxial line interconect for professional digital television baseband component Y, Cb, Cr data at a total data rate of 270Mbit/sec – (i.e. Y -10 bit samples at 13.3MHz sample rate and two 10-bit samples of chrominance components at 6.75MHz = 10 bits at 27Megasamples per sec.) Also 8 bit sampled = 216 Mbit/sec. Actual active video is only approximately 75% of total data once vertical and horizontal blanking intervals included. Up to 8 AES/EBU stereo digital audio signals (i.e 16 tracks) can also be included
		Refer to standard: **ITU-R BT.656-4** (02/98), Interfaces for Digital Component Video Signals in 525-Line and 625-Line Television Systems Operating at the 4:2:2 Level of Recommendation **ITU-R BT.601** (Part A)
127. Service	DTV	A sequence of programs under the control of a broadcaster, which can be broadcast as part of a schedule - (from MHP).
128. Service Address (URL)	DVB services	In DVB the DAVIC/DVB URL may be used : dvb://<original_network_id>.<transport_stream_id>.<service_id> [.<component_tag>][;<event_id>]][/<...>] This should be unique for any service. If the same program content is showing in two different mediums – eg. terrestrial and cable, from a DVB perspective they are different services as, at least, the transport_stream_id for each is different.
129. Service Information (SI)	MPEG & DVB	Service information (SI) is non-program data added to a digital broadcast so that a receiver can automatically configure itself and display information to the viewer for selection of services and/or events within the digital multiplex. It includes several tables of information – about tuning frequencies and formats (NIT), services (SDT), time and date and time zone (TDT & TOT) and some EPG information (EIT). SI allows for identification of services or events for the user and may also provide information on services carried by different multiplexes and even other networks (usually on satellite services).
		The SI is an integral part of a DVB MPEG-2 transport stream that augments and extends the relevant Program specific information (PSI) specified in ISO/IEC 13818-1 (MPEG-2 Systems), the Program association table (PAT) and Program map table (PMT). Other tables such as NIT, SDT, EIT, TDT, TOS, etc are specified in the DVB ETSI document **EN 300 468** and **TR 101 211** – also Standards Australia DTV documents AS 4599 (transmission) and AS 4933 (receivers).
130. Service multiplex and transport	MPEG	In an MPEG system, 'service multiplex and transport' refers to the division of the digital data stream into 'packets' of information and the means of uniquely identifying each packet or packet type. Also the appropriate methods of multiplexing these video data stream packets with audio data stream packets and ancillary data stream packets into a single data stream consisting of a sequence of 188-byte transport packets (4 Byte header + 184 Byte payload).
131. Set-Top-Box (STB)		A modular unit for decoding video, audio, and data services physically separated from a display device. Also known as a set-top-unit (STU) or an integrated receiver decoder (IRD), mainly in regard to satellite services.

Term	Relevance	Description
132. SGML	Data	Standard Generalized Markup Language (ISO 8879:1985), the international standard for defining descriptions of the structure of different types of electronic document. SGML is very large, powerful, and complex. It has been in heavy industrial and commercial use for over a decade, and there is a significant body of expertise and software to go with it. XML is a lightweight cut-down version of SGML.
		There is an SGML FAQ at http://lamp.infosys.deakin.edu.au/sgml/sgmlfaq.txt which is posted every month to the comp.text.sgml newsgroup, and the SGML Web pages are at http://xml.coverpages.org/.
133. Single Frequency Network (SFN)	DTV Transmission	Single Frequency Networks (as opposed to Multi Frequency Networks MFNs), refer to a number of transmitters and/or repeaters or translators, all operating on the same spectrum channel to extend reception within a service area.
		This is not possible with analog transmissions such as PAL where reception may be severely impaired if signals from different transmission points are simultaneously received but offset by small time differences resulting in severe ghosting.
		But it is possible with some types of digital transmission such as DVB-T's COFDM. In DVB a time reference packet (PID 0x15) is included which is referenced at each transmission point where they are synchronised by a GPS time reference. If a receiver receives signals that are time offset outside the transmissions "guard interval" then the reception reliability falls. This area of interference (aka 'mush zone'), between transmissions can be controlled by 2 means:
		• The COFDM "guard interval" length (i.e. the period when the receiver refrains from sampling the signal after a symbol change). A larger guard interval allows greater distance between transmission points. Some Australian broadcasters use $1/8^{th}$ (128µS on 8k) and others use $1/16^{th}$ (64µS); and -
		• whether a time offset is introduced at a transmission point. This can be used to push the interference into a low population area.
		For example, if the signals from 2 DVB-T SFN transmitters are transmitted in sync, reception locations outside the area enclosed by the 2 transmitters might encounter problems as they would receive from the nearest transmitter with a very short propagation delay (i.e. Dist/C seconds), but if the distant transmitter is received at significant level, it will have a significant delay probably greater than the 'guard interval' and dubious reception will result. Some SFNs around Sydney use about 9µs offset.
		In the USA, DTT broadcasters are experimenting with SFNs using 8-VSB.
134. SMIL	Data	Synchronized Multimedia Integration Language 2.0 (SMIL, pronounced "smile") puts animation on a time line, allows composition of multiple animations, and describes animation elements for any XML-based host language.
135. Standard Definition Television (SDTV)		This term is used to signify a digital television system in which the quality is approximately equivalent to that of broadcast or cable NTSC and PAL as seen in the customer's TV receiver.
		The term Conventional Definition Television (CDTV) has been used to signify the analog PAL or NTSC television system as defined in ITU-R Recommendation 470.

Acronyms and Glossary of Terms Relating to
Interactive TV & Multimedia Home Platform (MHP)

Term	Relevance	Description
136. Stereo & Joint Stereo (for MPEG)	Audio & Compression – MPEG & Dolby	MPEG-1 Layer II allows 4 'modes': Stereo, joint_stereo, dual_channel and single_channel. The audio may be sampled at 44.1, 48(usually), or 32 kHz. Data rates extend from 32kb/s up to 384kb/s (single channel to 192kb/s).
		'Stereo mode' creates 2 independent channels for both left and right. When stereo mode is used, it should be at bitrate greater than 192 kbits -about half of which is for each channel.
		Stereo_mode at a sufficient bitrate (eg. at least 256kbit/s), allows the phase relationships between channels to be maintained so that accurate Dolby Prologic™ or Prologic II decoding can add spatial enjoyment to home listening environment.
		Layer II also allows 4 'mode_extension's in the joint_stereo mode known as 'intensity_stereo' sub-bands. (In MPEG-1 Layer III –MP3, a MS mode is also available.
		Joint Stereo coding is a way of reducing the data quantity requirement by exploiting any stereophonic redundancies – i.e. when the program material is mainly monaural (L=R). Joint stereo has 2 submodes called IS and MS. 'Joint_Stereo intensity_stereo' destroys phase information and shouldn't be used for high-quality encoding. Joint_stereo is best when encoding at 128 kbits with suitable material. If there is too much stereo information then reproduction may be marred by a 'flanging' or 'swishing' effect. 'Joint Stereo MS' is only available in MP3.
		MS stereo – (means Middle/Side but also sometimes called Mono & Stereo-difference) a method of carriage of 2-channel audio that gains efficiency if the program material is predominantly mono or centre with little individual left or right side directionality. – i.e. there is redundancy because mostly L=R. Used in MP3 and analog FM radio as it is compatible with existing monaural receivers. The middle/centre mono signal is left plus right (L+R); the stereo difference is left minus right (L-R).
137. Surround sound	Audio	Refers to listening environments where loudspeakers are positioned around the listener(s). Besides the front loudspeakers, other loudspeaker(s) are positioned to the rear and sometimes to the sides. The intention is to recreate the ambience and directionality of the original scene being reproduced. Sound systems employing surround sound can recreate such effects by processing the program stereo channels; or better stereo with phase encoded material such as Dolby ProLogic™; or best, from a discrete multichannel system – for example a 5.1 (six) channel system that includes a low frequency sub-woofer channel.
138. SVG	Graphics	Scalable Vector Graphics: is an open-standard vector graphics format that allows the design of Web pages and entire Web sites with high-resolution graphics that incorporate real-time data. It delivers two-dimensional vector graphics and mixed vector and raster graphics to the Web in XML, ensuring accessibility, dynamism, reusability, and extensibility. SVG Version 1.0 was progressed to a W3C Proposed Recommendation on 19 July 2001.
139. S-video plug	Hardware	A domestic analog baseband video interconnection on a small 4-pin plug where the luminance and chrominance (on a PAL or NTSC subcarrier) are kept separate so as to avoid the resolution loss and chrominance – luminance interference that occurs when combined into a single composite PAL or NTSC signal. (Also known as S-VHS.)
140. Time and Date Notation	Digital Broadcast & Computer reference time	International Atomic Time (**TAI**): The timing standard based on measurement of the atomic transition/oscillation of the element caesium, which is defined to have a frequency of 9,192,631,770 Hz.
		Universal Time (**UT**) is a time scale based on astronomical observation. Greenwich Mean Time (**GMT**) is the same as UT.
		UTC – Co-ordinated Universal Time is a time scale with seconds coincident to those of TAI but within a close tolerance (± 0.8 sec) of UT.
		See also Modified Julian Date (MJD) Item 78.
		More detailed information on time keeping may be found at web sites such as http://www.boulder.nist.gov/timefreq/general/enc-ch.htm#utc
		And further time information may be obtained at : http://www.bipm.fr/enus/5_Scientific/c_time/time_server.html

Term	Relevance	Description
141. Tiresias (typeface/fonts)	Screen Font for TV subtitles, iDTV (MHP, MHEG)	A san-serif typeface developed by the Royal National Institute for the Blind (RNIB – a UK registered charity). Designed to optimise legibility on television displays for those viewers who relied on subtitles but also intended for use as 'resident' in receivers for enhanced and interactive content. This font is usable for displays on both 4:3 and 16:9 widescreen displays – while the characters may be a little squeezed on a 4:3 screen and a little stretched on 16:9 screen, they remain legible. The typeface may be in several fonts – eg. normal 12point, italic 12point, bold 18point. RNIB retains the rights to the basic font design including other applications, such as printing. BitStream Inc. is the distributor of the font and in the proprietary PFR format it's sufficiently compact to be used in digital television. See also Fonts - Item 47, page 23.
142. Transmission Parameter Signalling (TPS)	DVB	The TPS carriers are used for the purpose of signalling parameters related to the transmission scheme, i.e. to channel coding and modulation. The TPS is transmitted in parallel on 17 TPS carriers for the 2K mode and on 68 carriers for the 8K mode. Every TPS carrier in the same symbol conveys the same differentially encoded information bit.
143. Transport Stream (TS)	MPEG	In MPEG-2, a packet-based method of multiplexing into a single stream, one or more packetised elementary streams each consisting of related digital streams of various material. This material may be video, audio and other information such as teletext, bit-mapped subtitles, and other supporting material in an internet type format. Other streams may be in a private data format. The streams may have one or more independent time bases.
144. Transport stream packets	MPEG	A way of breaking up the continuous stream of MPEG compressed video, audio and other data for ease of passing through various transmission systems such as broadcast. In MPEG-2, the packet length is 188-bytes including a 4-byte header which contains a 'PID' for identification. The 184 byte payload may include data from the PES packets (i.e. video, audio, etc.), information on the format of the contents (PSI) and/or adaptation fields or stuffing bytes.
145. TV-Anytime	Standards Forum	Standards for PVR/PDRs. Formed in September 1999, the TV-Anytime Forum is developing open specifications for interoperable and integrated systems that will allow broadcasters and other service providers, consumer electronics manufacturers, content creators and telecommunications companies to most effectively utilize high-volume digital storage in consumer devices. The forum has published 4 specifications – description, applications, metadata and content referencing. These are being extended by further and new work, including work on 'Rights Management and Protection'. Additionally, the MHP is now reviewing this work with the intention of its incorporation into MHP Ver2.0 www.tv-anytime.org
146. UMID	SMPTE	Unique Material Identifier for content essence. Content may be video, audio, data or system which may represent a group of picture, audio and data. Note - the UMID has a 12 byte SMPTE label. XY defines the Material/Instance number creation and/or useage methods.
147. USB	Hardware	Universal Serial Bus – an interconnect standard for PCs and other networked equipment – allows attachment of multiple peripheral devices simultaneously with automatic device detection and installation. USB 1.1 allows data rates up to 12Mbits/s and the USB 2.0 standard increases the specification up to 480Mbits/s. Two plug/cable versions are used: -a straight transmit/receive pair, 4-wire version and 6-wire version, which can also feed DC power to the peripheral). Peripherals include modems, mouse, keyboard, scanner, printer, displays, speakers, etc. The standard supports 'plug and play' or hot swapping. www.usb.org/

Term	Relevance	Description
148. Variable Bit Rate (VBR)	Data – transmission or storage, MEG	For many applications using data compression techniques for video and audio material, variable bit rate (VBR) compression generally gives a better result than constant bit rate (CBR) systems, both in terms of picture quality and the total amount of data generated.
		VBR systems compress video signals such that if there is little movement or detail in the picture, there is less data required to define the scene and thus less output. Conversely, if there is a lot of fine detail in the picture or there is a lot of movement or a scene change, then the data rate rises to adequately define the picture.
		That is, VBR encoding devices increase data rates when necessary to preserve quality, and decrease data rates with easier content to improve efficiency. These VBR devices, therefore, are sometimes referred to as providing constant-quality operation.
		Conversely, Constant Bit Rate (CBR) encoding devices operate with data rate constrained to a constant value. When data rate is fixed, there will be some picture quality variation, which will be a function of the picture complexity. Only if data rates are sufficiently high, can these variations be relatively imperceptible.
		DVD is the most familiar example of VBR implementation, where total storage efficiency is especially critical. The average picture bit rate on a DVD for 24/25 frame per second, film material is around 5 Megabit per second (Mbps) while the peak rate may go past 8 Mbps. (Film can also be "progressive scan" encoded which is more efficient than conventional "interlace scan" TV pictures.
		Professional television equipment mainly uses CBR on tape and in some editing disk recorders. Television digital transmission may be able to use VBR by means of 'statistical multiplexing' if there are many separate non-related video services in the one transport stream.
		Regardless of the type of compression (VBR or CBR), all practical systems need some limits on allowable bit rate variations. To address this, MPEG-2 specifies a data buffer (model) for both compression and transport. It is the responsibility of the compression encoder to manage the data rate, through varying quantization granularity, to avoid buffer overflow or underflow.
149. Vertical Blanking Interval (VBI)	Analog TV	Present in conventional, uncompressed TV signals, corresponding to the unseen space at the top of a TV picture. Historically, this time period was provided in the sequence of a television signal so that a CRT picture tube scanning circuit had time to return the scanning electron-beam spot from the bottom of the screen to the top, in preparation for the next picture scan.
		It can be used to carry ancillary data, such as teletext including closed captions on the assumption that TV displays will not show the data which might otherwise appear as flashing white dots at the top of picture.
150. W3C	Standards	World Wide Web Consortium (www.w3c.org) : created in October 1994 to lead the World Wide Web to its full potential by developing common protocols that promote its evolution and ensure its interoperability. W3C has more than 500 Member organizations from around the world and has earned international recognition for its standards and contributions to the growth of the Web.
151. Wide Screen Signalling (WSS)	Standard	A wide screen signalling system using line 23 in 625 line systems originally used for the European analog PAL-Plus system. The wide screen signalling information contains information on the aspect ratio range of the transmitted signal and its position, on the position of the subtitles and on the camera/film mode. Furthermore signalling for EDTV and for surround sound is included. The details of the standard are found in **ETS 300 294**.
152. WYSIWYG	Graphic displays	What You See Is What You Get : Refers to the visual appearance seen in one medium (eg. a computer screen), being faithfully transferred to another (eg. a printed page).

Term	Relevance	Description
153. XHTML	Data	The **W3C** has released XHTML as `a reformulation of HTML 4 in XML 1.0' . This specification defines HTML as an XML application, and provides three DTDs corresponding to the ones defined by HTML 4.0. The semantics of the elements and their attributes are as defined in the W3C Recommendation for HTML 4.0. These semantics provide the foundation for future extensibility of XHTML. Compatibility with existing HTML user agents is possible by following a small set of guidelines.
154. Xlet	Data	Interface used for DVB-J application life cycle control – (from MHP).
155. XML	Data	Extensible Markup Language: XML's strength is in its ability to be adaptable to almost any conceived application of information storage or transfer. It allows groups of people or organizations to create their own customized markup applications for exchanging information in their domain (eg. music, chemistry, electronics, hill-walking, finance, surfing, petroleum geology, linguistics, cooking, knitting, stellar cartography, history, engineering, etc).
		That is, XML is not just for Web pages: it can be used to store any kind of structured information, and to enclose or encapsulate information in order to pass it between different computing systems which would otherwise be unable to communicate.
		It is called extensible because it is not a fixed format like HTML (a single, predefined markup (declarative) language). Instead, XML is actually a `metalanguage' --a language for describing other languages. This allows design of customized markup languages for limitless different types of documents.
		XML, in fact, is a lightweight cut-down version of SGML, which keeps enough functionality to make it useful but removes all the optional features that make SGML too complex to program for in a Web environment.
		W3C makes recommendations for XML as a "Universal format for structured documents and data on the Web," and formated with:
		Field names in <angle brackets> ;Field values between names
		And defines 24 data types:
		• ui1, ui2, ui4, i1, i2, i4, int,
		• r4, r8, number, fixed.14.4, float
		• char, string
		• date, dateTime, dateTime.tz, time, time.tz
		• boolean
		• bin.base64, bin.hex
		• uri
		• uuid
		UPnP also uses XML
		XML is a "text" language and as such is verbose and can be easily read. To reduce storage or transmission bandwidth/download requirements, loss-less compression is required. To protect data privacy/security, encryption is required.
		http://www.w3.org/XML/

Term	Relevance	Description
156. Y, Pb, Pr and Y, Cb, Cr and Y, U, V		Various Standards organisations such as the SMPTE and ITU-R use the "Y, Pb, Pr" notation as the **analog** baseband representation of a colour television signal, but if this is digitised, then the **digital** representation is notated as "Y, Cr, Cb".
		Y, Pb, Pr are **analog** signals used for equipment interconnection by three (3) separate leads. The Y lead also carries a composite of the horizontal and vertical scan synchronisation signals.
		Y, Cb, Cr are **digital** signals and are usually present internally in equipment in digital processing, but when used for external interconnects, the three signals are streamed over a single lead in sequence, such as the 270 Mbps Serial Digital Interface used in professional equipment, (see ITU-R BT.656-- Interfaces for digital component video signals in…625-line television systems operating at the 4:2:2 level of ITU-R BT.601), and for HD as shown in ANSI/SMPTE 295M-1997 1920x1080 50 Hz Scanning and Interfaces.
		Colour television requires three signals, which are initially captured, and ultimately displayed, as shades of Red, Green and Blue (RGB). For intermediate processes such as storage on tape, editing, switching, video compression and transmission, it is more convenient to mathematically 'matrix the RGB signals into Luminance (Y) and two "colour-difference" (R-Y and B-Y) signals. These have been chosen to match the physiology of the human eye to help mask noise or distortion effects introduced in editing and transmission.
		The "Y" part is the luminance also known as monochrome or black and white component. The Y signal always ranges between 0 (black) and 100% (white) with intermediate values being shades of grey.
		Nominally for standard definition (PAL) Y= 30% R + 59% G + 11% B.
		But for HDTV colorimetry, **ITU-R BT.709** specifies nominally for high definition (1080line) Y= 21% R + 72% G + 7% B which is more suitable for certain types of display.
		The Pb or Cb component is proportional to the B-Y signal and similarly Pr or Cr is proportional to the R-Y signal. These signals can have a negative value. For example a yellow picture made from equal Red and Green is bright (so Y is large), but there is no Blue colour, so B-Y will be negative.
		Reference to standards show the notation as R' G' B' or Y' Cb' Cr' – the ' pedantically represents that the signal is non-linear as it has been modified to fit the transfer characteristic (gamma) of the display cathode ray tube (CRT).
		Y, U, V nomenclature is an outcome from the analog PAL TV world. The U and V are symbols for the 4.43MHz colour subcarrier signals carrying B-Y and R-Y information, respectively. When U and V are combined, This combined RF signal is present as a separate signal in an "S-Video" (Y/C) connection. If the combined U and V is added to baseband 'Y' this becomes the widely used baseband composite CVBS PAL signal.
		Unfortunately the term Y, U, V is occasional used when Y, Pb, Pr is what is actually meant.