

ALPHABET SOUP

ATSC from A to Z

Those intimately involved in the ATSC standards process are familiar with the multitude of acronyms and terms that television engineers deal with every day. For those of us without engineering degrees (and even as a refresher for you technologists out there) here's "ATSC from A to Z" – more than 400 acronyms and 240 terms and descriptions used in ATSC standards and recommended practices:

Acronym	Definition
A	
A/D	Analog to Digital
A/V	Audio/Video
ABNF	Augmented Backus-Naur Form
ACATS	Advisory Committee on Advanced Television Service
ACE	Active Constellation Extension
ACI	Adjacent Channel Interference
ACK	Acknowledgement
Ad-ID	Format identifier for identifying advertising assets
AEA	Advanced Emergency Alerting
AEAT	Advanced Emergency Alert Table
AES	Advanced Encryption Standard
AFD	Active Format Description
AGC	Automatic Gain Control
AGL	Above Ground Level
ALC	Asynchronous Layered Coding
AL-FEC	Application Layer Forward Error Correction
ALP	ATSC Link-Layer Protocol
ALPTPALP	Transport Protocol
AMC	Adaptive Modulation and Coding
AMP	Application Media Player
AP	Additional Parity
APD	Associated Procedure Description
API	Application Programming Interface
ARQ	Automatic Repeat-reQuest
ASL	American Sign Language
ATSC	Advanced Television Systems Committee
AWGN	Additive White Gaussian Noise
B	
BAT	Broadcast Access Terminal
BBP	Base Band Packet
BCH	Bose, Chaudhuri, Hocquenghem

BCH (n, k, t)	Bose-Chaudhuri-Hocquenghem Error Correction Code having an n-bit codeword with k information bits (and hence n-k parity check bits) that is able to correct up to t bit-errors in the information bits.
BCI	Broadcast Control Information
BEB	Binary Exponential Backoff
BER	Bit Error Rate
BICM	Bit-Interleaved and Coded Modulation
BIL	Bit InterLeaver
BMFF	Base Media File Format
BP	Bandpass
bpcu	bits per cell unit
BPPS	Baseband Packetizer Packet Set
bps	bits per second
BPSK	Binary Phase Shift Keying
BRET	Bootstrap Reference Emission Time
BS	Bootstrap
BSID	Broadcast Stream ID
bslbf	bit stream, left-most bit first
BSR	Baseband Sampling Rate
BTC	Broadcast Test Center
BTS	Broadcast Television Station
BXF	Broadcast eXchange Format

C

C	Center (audio channel)
C/I	Carrier to Interference ratio
C/N	Carrier-to-Noise ratio
CA	Certificate Authority
CAP	Common Alerting Protocol
CAZAC	Constant Amplitude Zero Auto-Correlation
CC	Closed Captions
CCI	Co-Channel Interference
CCIR	Consultative Committee on International Radio
CD	ATSC 3.0 Companion Device
CDL	Convolutional Delay Line
CDM	Consumption Data Message
CDN	Content Delivery Network
CDU	Consumption Data Unit
CEA	Consumer Electronics Association
CENC	Common ENCrption
CFF	Common File Format
CFO	Center Frequency Offset
CID	Context Identifier
CL	Core Layer
Cod	Code rate
CP	Continual Pilot

CP	Codepoint
CP	Cyclic Prefix
C-POL	Circular Polarization
CRC	Cyclic Redundancy Check
CRI	Clock Relation Information
CSRC	Contributing Source Identifier
CSS	Cascading Style Sheets
CSS	Cascading Style Sheets
CTA	Consumer Technology Association
CTC	Convolutional Turbo Code
CTI	Convolutional Time Interleaver
CVS	Coded Video Sequence
CW	Continuous Wave

D

D/A	Digital to Analog
D/U	Desired/Undesired ratio
DASH	Dynamic Adaptive Streaming over HTTP
DASH-IF	DASH Industry Forum
dB	deciBel
dB μ V	dB above 1 μ V
dBm	decibel referenced to 1 milliwatt
dBm	dB above 1 mW
DC	Direct Current
DDE	Data Delivery Event
DECE	Digital Entertainment Content Ecosystem
Demux	Demultiplexer
DFT	Discrete Fourier Transform
DMD	Dynamic MetaData
DNS	Domain Name System
DRC	Dedicated Return Channel
DRC	Dynamic Range Control
DRCT	Dedicated Return Channel Table
DSBSS	Direct Sequence Buried Spread Spectrum
DSCP	Data Source Control Protocol
DSL	Digital Subscriber Line
DSS	Data Source Signaling
DSTP	Data Source Transport Protocol
DTCP	Digital Transmission Content Protection
DTV	Digital Television, nominally ATSC 1.0
DUT	Device Under Test
DWD	Distribution Window Description

E

EA	Emergency Alert
EAA	Emergency Alert Application

EAM	Emergency Alert Message
EAS	Emergency Alert System
EBn	Elementary Stream Buffer (nth instance)
EBU	European Broadcast Union
ECC	Error Correction Coding
ECDHE	Elliptic Curve Diffie-Hellman Ephemeral key exchange
ECDSA	Elliptic Curve Digital Signature Algorithm
EFDT	Extended File Delivery Table
EHFR	Efficient High Frame Rate
EIDR	Entertainment Industry Data Registry
EL	Enhanced Layer
eMBMS	enhanced Multimedia Broadcast/Multicast Service
EMDF	Extensible Metadata Delivery Format
EME	W3C Encrypted Media Extensions
EMI	Electromagnetic Interference
E-POL	Elliptical Polarization
ERP	Effective Radiated Power
ESG	Electronic Service Guide
ESR5	Erroneous-Second Ratio
⌊X⌋	The greatest integer less than or equal to X

F

FBSR	FeedBack Shift Register
FCC	Federal Communications Commission
FDD	File Delivery Description
FDM	Frequency Division Multiplexing
FDT	File Delivery Table
FEC	Forward Error Correction
FET	Field Effect Transistor
FFT	Fast Fourier Transform
FI	Frequency Interleaver
FIFO	First-In-First-Out
FLUTE	File Delivery over Unidirectional Transport
fps	frames (or pictures) per second

G

Gbps	Gigabits per second
GBR	Guaranteed Bit Rate
GCM	Galois Counter Method
GHz	Gigahertz
GI	Guard Interval
GNSS	Global Navigation Satellite System
GoP	Group of Pictures
GP	Guard Period
GT	Guard Time
GPS	Global Positioning System

GUI	Graphical User Interface
H	
HAAT	Height Above Average Terrain
HAGL	Height Above Ground Level
HbbTV	Hybrid Broadcast Broadband Television
HD	High Definition
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
HD-SDI	High Definition Serial Digital Interface
HDTV	High-Definition Television
HELD	HTML Entry pages Location Description
HEVC	High Efficiency Video Coding
HFR	High Frame Rate
HLG	Hybrid Log-Gamma
HOA	Higher Order Ambisonics
H-POL	Horizontal Polarization
HRBM	Hypothetical Receiver Buffer Model
HTI	Hybrid Time Interleaver
HTML	HyperText Markup Language
HTML5	Hyper Text Markup Language, rev 5
HTTP	Hyper-Text Transport Protocol
HTTPS	Secure Hyper Text Transfer Protocol
Hz	Hertz

I	
I/Q	In-phase / Quadrature
IANA	Internet Assigned Numbers Authority
ID	Identifier
ID	Identification
IDFT	Inverse Discrete Fourier Transform
IDR	Instantaneous Decoding Refresh
IEEE	Institute of Electrical and Electronic Engineers
IERS	International Earth Rotation and Reference Systems Service
IETF	Internet Engineering Task Force
IF	Interleaving Frame
IF	Intermediate Frequency
IFFT	Inverse Fast Fourier Transform
IGMP	Internet Group Management Protocol
IMSC1	Internet Media Subtitles and Captions Version 1
IP	Internet Protocol
IP3	Third-Order Intermodulation Products
IPF	Immediate Play-out Frame
IPTV	Internet Protocol Television
IR	Infra-Red
IR	Initialization and Refresh

IR-DYN	IR Dynamic
IS	Initialization Segment
ISO	International Organization for Standardization
ISO BMFF	ISO Base Media File Format
ISO/IEC	International Organization for Standardization / International Electrotechnical Commission
ISOBMFF	International Organization for Standardization Base Media File Format
ITI	International Telecommunications Union
ITU-R	International Telecommunication Union Radiocommunication Sector
ITU-T	International Telecommunication Standardization Sector
IU	Interleaving Unit

J

JSON	JavaScript Object Notation
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K

kHz	kilohertz
kHz	kilo Hertz

L

L	Left (audio channel)
L1	Layer 1
LAN	Local Area Network
LAPR	Licensed-to-Average Power Ratio
LCT	Layered Coding Transport
LDM	Layered Division Multiplexing
LDPC	Low-Density Parity Check
LED	Light Emitting Diode
LF	Left Front (audio channel)
LFE	Low Frequency Effects (audio channel)
LFSR	Linear Feedback Shift Register
LKFS	Loudness, K-weighted, relative to Full Scale
LLS	Low Level Signaling
LMT	Layer Mapping Table
LMT	Link Mapping Table
LPF	Low Pass Filter
LR	Left Rear (audio channel)
LS	Left Side or Left Surround (audio channel)
LSB	Least-Significant Bit
LTE	Long Term Evolution

M

M&E	Music and Effects
MA3	MMT ATSC 3.0 Signaling Message
MAC	Media Access Control

MAE	Metadata Audio Elements
MBMS	Multimedia Broadcast/Multicast Service
Mbps	Megabits per second
MDCoIP	Media Device Control over IP
MDE	Media Delivery Event
MHAS	MPEG-H Audio Stream
mhm1	ISO Base Media File Format sample entry type for MPEG-H Audio Stream
MHz	Megahertz
MIME	Multipurpose Internet Mail Extensions
MIMO	Multiple Input Multiple Output
MISO	Multiple Input Single Output
MMT	MPEG Multimedia Transport
MMTP	MPEG Media Transport Protocol
Mod	Modulation
MPD	Media Presentation Description
MPEG	Moving Pictures Experts Group
MPI	Media Presentation Information
MPT	MMT Package Table
MPU	Media Processing Unit
MRC	Maximum Retransmission Count
ms	millisecond
MSB	Most-Significant Bit
MSE	W3C Media Source Extensions
µsec	microsecond
MTU	Maximum Transfer Unit
MTU	Maximum Transmission Unit
Mux	Multiplexer
MVPD	Multichannel Video Programming Distributor

N

N/A	Not Allowed
N/A	Not Applicable
NACK	Negative Acknowledgement
NAL	Network Adaption Layer
NAL	Network Abstraction Layer
NGA	Next Generation Audio
NoA	Number of Active (cells)
NoC	Number of (useful) Carriers
NRT	Non-Real Time
nsec	nanosecond
NTP	Network Time Protocol
NUC	Non-Uniform Constellation

O

OAM	Object Audio Metadata
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OCSP	Online Certificate Status Protocol
OFDM	Orthogonal Frequency Division Multiplexing
OFDMA	Orthogonal Frequency Division Multiple Access
OFI	Optional Field Indicator
OMA	Open Mobile Alliance
OMA BCAST	Open Mobile Alliance Broadcast Mobile Services Enabler Suite
OSD	On-Screen Display
OSI	Open Systems Interconnection
OSN	On Screen message Notification
OTA	Over The Air
OTI	Object Transmission Information

P

PAM	Pulse Amplitude Modulation
PAPR	Peak-to-Average Power Ratio
PAT	MPEG-2 Program Association Table
PC	Personal Computer
PCM	Linear Pulse Code Modulation. In this document this is understood to be the uncompressed format for audio signals.
PD	ATSC 3.0 Primary Device
PDU	Protocol Data Unit
PER	Packet Error Rate
PH	Phase Hopping
PHY	Physical Layer
PID	Packet Identifier
PIP	Picture-in-Picture
PLP	Physical Layer Pipe
PLP-R	Physical Layer Pipe for Return Channel
PN	Pseudo-Noise
ppm	parts per million
PQ	Perceptual Quantization
PRACH	Physical Random Access Channel
PRBS	Pseudo Random Bit Sequence
Pre	Preamble
PSIP	Program and System Information Protocol
PT	Payload Type
PTP	Precision Time Protocol
PUSCH	Physical Uplink Shared Channel

Q

QAM	Quadrature Amplitude Modulation
QCI	QoS Class Identifier
QoS	Quality of Service
QP	Quality Point
QPSK	Quadrature Phase Shift Keying

R

R	Right (audio channel)
RAP	Random Access Point
RCS	relative cyclic shift
RDT	ROHC-U Description Table
RDT	ROHC-U Description Table
RF	Radio Frequency
RF	Right Front (audio channel)
RFC	Request For Comment (IETF standard)
RFU	Reserved for Future Use
RMP	Receiver Media Player
RMS	Root Mean Square
RNTI	Radio Network Temporary Identity
ROHC	RObust Header Compression
ROHC-U	RObust Header Compression UDP
ROUTE	Real-time Object delivery over Unidirectional Transport
ROUTE-DASH	Real-time Object delivery over Unidirectional Transport / Dynamic Adaptive Streaming over HTTP
RR	Right Rear (audio channel)
RRM	Reference Receiver Model
RRT	Rating Region Table
RS	Right Side or Right Surround (audio channel)
RSA	A method for obtaining digital signatures and public-key cryptosystems (originally proposed by Rivest, Shamir, and Adelman).
RT	Real Time
RTC	Retransmission Count
RTP	Real-time Transport Protocol
Rx	Receiver

S

SAP	Segment Access Point
SAP	Secondary Audio Programming
SBS	Subframe Boundary Symbol
SC-FDMA	Single Carrier Frequency Division Multiple Access
SCG	Standard Color Gamut
SCT	Server Current Time
SD	Standard Definition
SDO	Standards Development Organization
SDR	Standard Dynamic Range
SECP	Standard for Efficient Cryptography Elliptic Curve Domain Parameters
SEI	Supplemental Enhancement Information
SFN	Single Frequency Network
SFR	Standard Frame Rate
SG	Service Guide
SGDD	Service Guide Delivery Descriptor
SGDU	Service Guide Delivery Unit

SHA	Secure Hash Algorithm
SHVC	Scalable High Efficiency Video Coding
SID	Sub-stream Identifier
SIMO	Single Input Multiple Output
SINR	Signal to Interference plus Noise Ratio
SISO	Single Input Single Output
SL-HDR1	Single Layer High Dynamic Range part 1
SLS	Service Layer Signaling
SLT	Service List Table
SMPTE	Society of Motion Picture and Television Engineers
SN	Sequence Number
SNR	Signal-to-Noise Ratio
SP	Scattered Pilot
SPLP	Single Physical Layer Pipe
SPS	Sequence Parameter Set
SSDP	Simple Service Discovery Protocol
SSM	Source-Specific Multicast
SSM	Service Signaling Manager
SSRC	Synchronization Source Identifier
STL	Studio-to-Transmitter Link
STLTP	Studio-to-Transmitter Link Tunneling Protocol
S-TSID	Service-based Transport Session Instance Description

T

TAI	International Atomic Time
TAI	Time Atomic International
TAI	International Atomic Time
TASO	Television Allocation Study Organization
TB	Transport Block
TBI	Twisted Block Interleaver
TBn	Transport Buffer (nth instance)
tcimbsf	two's complement integer, msb first
TCP	Transmission Control Protocol
TDCFS	Time Diversity Code Filter Set
TDCFS	Transmit Diversity Code Filter Set
TDM	Time Division Multiplexing
TG-3	Technology Group 3
TI	Time Interleaver
TI	Time Interval
TLS	Transport Layer Security
T-MDE	Transport Media Delivery Event
TOA	Threshold of Audibility
TOC	Table of Contents
TOI	Transport Object Identifier
TOL	Transport Object Length
TOV	Threshold of Visibility

TPO	Transmitter Power Output
TR	Tone Reservation
T-RAP	Transport-Random Access Point
TS	Transport Stream
TSI	Transport Session Identifier
TT	Timed Text
TTA	Telecommunication Technology Association
TTML	Timed Text Markup Language
TV	Television
TUID	Temporary User ID
Tx	Transmitter
TxID	Transmitter Identification

U

U/L	Uplink
UDP	User Datagram Protocol
UHD	Ultra High Definition
UHDTV	Ultra High Definition Television
UHF	Ultra High Frequency
UI	User Interface
uimsbf	unsigned integer, most significant bit first
UL-MAP	Uplink Resource MAP
UML	Unified Modeling Language
URCR	Usage Reporting-Capable Receiver
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
URN	Uniform Resource Name
US	United States
USB	Universal Serial Bus
USBD	User Service Bundle Description
USBD/USD	User Service Bundle Description / User Service Description
UTC	Universal Coordinated Time
UUID	Universally Unique Identifier

V

VDS	Video Description Service
VHF	Very High Frequency
VP1	The audio watermarking technology specified in A/334, "ATSC Standard: Audio Watermark Emission"
V-POL	Vertical Polarization
VPS	Video Parameter Set
VSWR	Voltage Standing Wave Ratio
W3C	World Wide Web Consortium

W

W3C	World Wide Web Consortium
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WAN Wide Area Network
WCG Wide Color Gamut

X

XLink XML Linking Language
XML eXtensible Markup Language
XOR eXclusive OR
XSL eXtensible Stylesheet Language

Y

YAATE You're almost at the end

Z

ZC Zadoff-Chu

#

μ s microsecond
 μ sec microsecond
16K 16384 point FFT size
16QAM 16-ary Quadrature Amplitude Modulation
2D Two dimensional
32K 32768 point FFT size
3D Three dimensional
3GPP 3rd Generation Partnership Program
8K 8192 point FFT size

Term	Definition
Active Area	The portion of the video picture area that is being utilized for program content. Also referred to in CTA-CEB16 as the useful image inside the video frame. Active area excludes letterbox bars and pillar box bars.
Adaptation Set	A set of interchangeable encoded versions of one or several media content components
Additional Header	An Additional Header is part of the ALP packet header. The presence of an Additional Header depends on the specific fields of the Base Header.
Additional View	Stereoscopic 3D video component using equivalent or lower resolution compared to the reference view video. The view can be provided together with the reference view to create an asymmetric 3D video. (E.g. reference view: UHD resolution, additional view: HD resolution).
Advanced Emergency Alert	Provides an emergency notification mechanism in ATSC 3.0 that is capable of forwarding a broad range of emergency data.
Alternative Presentation	A Presentation that supports the personalized audio use-case by providing alternative object properties to be used in combination with common object essences.
a-millisecond	A time interval approximately equal to one millisecond derived from a binary count of nanoseconds and actually equaling 220 nanoseconds, which represents 1,048,576 nanoseconds (i.e., having a Period of 1.048576 milliseconds).
Analyzed Media Duration	The shortest Period between times at which data segment boundaries in all data Streams on the inputs of a Scheduler align. Data segment boundaries are indicated to the Scheduler by markers carried in the headers of the structures transporting data to the Scheduler.
App	Application.
App-Based Feature	Service component consisting of an application, optional files to be used by the application, and optional notifications directing the application to take particular actions at particular times.
App-Based Service Application	Service consisting entirely of app-based features, which provide the user interface for the service. A.) A collection of documents constituting a self-contained enhanced or interactive service. The documents of an application can include HTML, JavaScript, CSS, XML and multimedia files. An application can access other data that are not part of the application itself. An Application is a special case of a locally cached content item and can be delivered via broadcast or broadband. B.) A downloaded collection of interrelated documents intended to run in the application environment specified in the A/344, "Interactive Content" and perform one or more functions, such as providing interactivity or targeted ad insertion. The documents of an application can include (but are not limited to) HTML, JavaScript, CSS, XML and multimedia files. An application can access other data that are not part of the application itself.

Application Context Cache	The Application Context Cache is a conceptual storage area where information from the broadcast is collected for retrieval through the Receiver Web Server. This document refers to the Application Context Cache as if it were implemented as actual storage though this is for convenience only. An Application Context Cache corresponds to the Application Context Identifier associated with each Broadcaster Application. Files delivered over ROUTE contain attributes that determine which Application Context Cache they will be associated with.
Application Context Identifier	An Application Context Identifier is a unique URI that determines which resources are provided to an associated Broadcaster Application by the Receiver. Resources may be associated with multiple Application Context Identifiers but a Broadcaster Application is only associated with a single Application Context Identifier. Details of the Application Context Identifier syntax are specified in the HELD.
Asset	Any multimedia data entity that is associated with a unique identifier and that is used for building a multimedia presentation.
ATSC 3.0 Bootstrap	The ATSC 3.0 Bootstrap provides a universal entry point into a broadcast waveform.
ATSC 3.0 Server	Any IP-connected device that provides content or other service to an ATSC 3.0 client, and that complies with the normative requirements of this standard.
ATSC Physical Layer Time (clock)	The ATSC Physical Layer Time is the time-scale described by the emitted ATSC Physical Layer Time samples, and corresponds exactly in rate with International Atomic Time (TAI).
ATSC Physical Layer Time (sample)	A sample time for ATSC Physical Layer Time is transmitted in the preamble. This data indicates the moment when the start of the first symbol of the immediately preceding bootstrap was emitted.
Audio Element	The smallest addressable unit of an audio Program.
Audio Presentation	Has the meaning given in the ATSC A/342 Audio, Part 1: Common Elements. Also referred to as a Preselection (DASH-IF), a Presentation (AC-4), or a Preset (MPEG-H).
Audio Program Component	Logical group of one or more Audio Elements that is used to define an audio Presentation, e.g., complete main, music & effects, dialog, etc.
Audio Signal	A.) Has the meaning given in the ATSC A/342 Audio, Part 1: Common Elements. B.) Has the meaning given in the "ATSC Standard: Audio Common Elements (A/342 Part 1)".
Audio Watermark	Data which is embedded in audio essence in such a way that it can be extracted (i.e., read) by an appropriately designed extractor.
Author Signature	A signature encoded in a specified form that is generated by the author of the application, which is the entity or entities whom claim authorship over the application content.
Base Field	The first portion of a Baseband Packet Header.
Base Header	A Base Header is part of the ALP packet header. A Base Header is

	always included in the header of an ALP packet and the first part of an ALP packet.
Base URI	The Base URI specifies the initial portion of a URL used by the Broadcaster Application to access files within the Application Context Cache. The Base URL is prepended to the relative URI path of a file to obtain the full URL of the file within the Application Context Cache. The Base URI is uniquely generated by the Receiver based on the Application Context Identifier defined for the Broadcaster Application.
Baseband Packet	A set of Kpayload bits which form the input to a FEC encoding process. There is one Baseband Packet per FEC Frame.
Baseband Packet Header	The header portion of a Baseband Packet.
Baseband Packetizer	Functional block that creates Baseband Packets.
BAT	An ATSC 3.0 receiver with a DRC terminal module in it, or equivalently a DRC-enabled ATSC 3.0 receiver.
Block Interleaver	An interleaver where the input data is written along the rows of a memory configured as a matrix, and read out along the columns.
Bootstrap	A defined sequence of symbols that introduces each Physical Layer frame and provides a universal entry point into a digital Transmission signal. Each Bootstrap carries a value that serves as an indicator of the format of an immediately following Preamble symbol.
Bootstrap Reference Emission Time	A time value indicating the instant at which the leading edge of the first symbol of a Bootstrap is to be emitted from the transmitting antenna(s), absent any timing offsets of individual Transmitter(s) in a Network.
Bootstrap Signaling (Information)	Synonymous with Low Level Signaling (LLS) information implemented by the Service List Table (SLT) in support of rapid RF channel scanning and service acquisition by the receiver through discovery of Service Layer Signaling (SLS) information.
Broadcast Gateway	A Broadcast Gateway converts source file objects, for example media, system information, and other opaque files, into SFN baseband description for distribution to Transmitters.
Broadcast Stream	The abstraction for an RF Channel which is defined in terms of a carrier frequency centered within a specified bandwidth.
Broadcast Stream ID	Identifier of a broadcast stream, as defined in Section 6.3.2 of A/331.
Broadcast Stream ID (BSID)	A 16-bit value that identifies the aggregate contents of a broadcast signal. Each transmitted signal that is unique (has content that is different from another signal) has a unique BSID; e.g., a signal translated onto a different frequency has the same BSID.
Broadcaster Application	A Broadcaster Application is used herein to refer to the functionality embodied in a collection of files comprised of an HTML5 document, known as the Entry Page and other HTML5, CSS, JavaScript, image and multimedia resources referenced directly or indirectly by that

document, all provided by a broadcaster in an ATSC 3.0 service. The Broadcaster Application refers to the client-side functionality of the broader Web Application that provides the interactive service. The distinction is made because the broadcaster only transmits the client-side documents and code. The server-side of this broader Web Application is implemented by an ATSC 3.0 receiver and has a standardized API for all applications. No server-side application code can be supplied by the broadcaster. The broadcaster may provide Web-based documents and code that work in conjunction with the Broadcaster Application over broadband making the Broadcaster Application a true Web Application. The collection of files making up the Broadcaster Application can be delivered over the web in a standard way or can be delivered over broadcast as packages via the ROUTE protocol.

BTS	An ATSC 3.0 transmitter with a DRC base station module in it, or equivalently a DRC-enabled ATSC 3.0 transmitter.
Byte-Range-based File Repair	The method of file repair whereby in the event of incomplete file reception over broadcast delivery, the receiver, as the file repair client, calculates the byte range(s) corresponding to the missing source symbols, and uses HTTP partial GET (or nominal HTTP GET) to retrieve that data from the repair server. The repair server, as a conventional HTTP server, is AL-FEC unaware, and stores the file object as the resource to be returned in part or in whole according to the client request.
Cell	A.) One set of encoded I/Q components in a constellation. B.) A complete transmission of an independently recoverable packet of data in an audio watermark. C.) Has the meaning given in the ATSC A/334 Audio Watermark Emission specification.
Cell Interleaver Center Frequency	An interleaver operating at the cell level. The point in the spectrum of a Physical Layer signal at which equal numbers of carriers are positioned both higher and lower in the spectrum.
Codec	A system consisting of an encoder and decoder
Coded Video Sequence	Sequence parameter sets which apply to a series of consecutive coded video pictures.
Combined PLP	A PLP after processing by the LDM injection block.
Concatenated Code	A code having an Inner Code followed by an Outer Code.
Constellation	A set of encoded (I component/Q component) points in the I/Q plane.
Content fragment	Portion of Service Announcement that describes ATSC program or content item, corresponding to Content fragment in OMA BCAST Service Guide model, with additions and constraints.
Content item	Set of one or more files which a service provider intends to be treated

	as a single unit for presentation purposes.
Context	RFC 3095 describes Context, as used herein, in the following manner: The context of the compressor is the state it uses to compress a header. The context of the decompressor is the state it uses to decompress a header. Either of these or the two in combination are usually referred to as “context,” when it is clear which is intended. The context contains relevant information from previous headers in the packet stream, such as static fields and possible reference values for compression and decompression. Moreover, additional information describing the packet stream is also part of the context, for example information about how the IP Identifier field changes and the typical inter-packet increase in sequence numbers or timestamps.
Contribution Encoding	An audio encoding format that is configured for the purpose of distributing broadcast audio within and among professional broadcast environments, where multiple stages of encoding and decoding are expected to be performed.
Core Layer	The first layer of a 2-layer LDM system. The only layer in a non-LDM system.
Core PLP	A PLP belonging to the Core Layer.
DASH Client	A DASH Client per the DASH-IF profile.
DASH Media Presentation	A DASH Media Presentation per the DASH-IF profile.
DASH Media Presentation Description (MPD)	A DASH MPD per the DASH-IF profile.
DASH Media Segment	A DASH Media Segment per the DASH-IF profile
DASH Period	A DASH Period per the DASH-IF profile.
DASH Representation	A DASH Representation per the DASH-IF profile.
DASH Segment	Refers to a DASH Initialization Segment or Media Segment per the DASH-IF profile.
Data Consumer	A device that receives a formatted stream of data and further processes and/or distributes it.
Data Delivery Event (DDE)	A Data Delivery Event (DDE) is the result of a block based MAC/PHY delivering relevant contents of a specific physical layer block to a specific ROUTE session at specific time.
Data Payload Symbols	Data and Subframe Boundary Symbols (i.e. non-Preamble symbols).
Data Producer	A device or process that generates a formatted stream of data.
Data Source	An origination point for data to be transmitted as content by the Physical Layer.
Data Source Signaling	Information sent from a Data Source to downstream functions to identify specific characteristics of the content of certain packets within

the data Stream to provide interlayer communications while avoiding layer violations in the system. Typically, Data Source Signaling information is carried in RTP headers in locations defined in this standard.

Default Video	For a Service that includes multiple video assets, indicates the video preferred by the service provider for selection in the absence of an action, instruction or configuration to make an alternate selection.
Distributor Signature	A signature encoded in a specified form that is generated by a distributor, which is a third party (e.g., the broadcaster) that is distributing the application on behalf of the author.
DRC Downlink	Downlink signaling and downlink data transmission of DRC-related information through the PLP for Return Channel (PLP-R).
DRC Uplink	Uplink signaling and uplink data transmission of DRC through the Physical layer and MAC layer specifications defined in A/323.
Dynamic Event EA Service	Has the meaning given in A/337. Service that delivers rich media resources that are referenced in an emergency alert CAP message.
Earliest Time	A time value that accompanies data sent as input to a Broadcast Gateway to indicate the first instant, as determined using TAI, at which the first byte of related data, including all wrappers and encapsulating protocols, may start emission on the Physical Layer.
Embed	The process whereby an audio signal is modified to include an audio watermark.
Embedder	A tool or process that is able to embed an audio watermark in an audio signal.
Emission Coding	An audio encoding format that is configured for the purpose of broadcast emission to receivers (viewers).
Emission Wakeup Field	The two Wakeup Bits in a Bootstrap when treated together as a field.
Enhanced Layer	The second layer of a 2-layer LDM system.
Enhanced PLP	A PLP belonging to the Enhanced Layer.
Entry Package	The Entry Package contains one or more files that comprise the functionality of the Broadcaster Application. The Entry Package includes the Entry Page and perhaps additional supporting files include JavaScript, CSS, image files and other content.
Entry Page	A.) An initial HTML5 document referenced by application signaling that should be loaded first into the User Agent. It is included as a file within the Entry Package. B.) The Entry Page is the initial HTML5 document referenced by application signaling that should be loaded first into the User Agent. The Entry Page is one of the files in the Entry Package.

ESG Service Event	Service that delivers Electronic Service Guide (ESG) information. Timed notification to receiver software or to an application indicating that some action is to be taken
Event Stream	A.) Stream of events. B.) An Event Stream is a series of messages, either static, in DASH signaling, or dynamic, contained in defined messages within media segments. The events contained within the Event Stream can initiate interactive actions on the part of a Broadcaster Application.
Exciter	An element of a Transmitter comprising data processing and signal processing functions including at least framing, error correction coding, waveform generation, modulation, and up-conversion to the output RF channel frequency.
Extended FDT Instance	An instance of the FLUTE FDT that includes extensions. The Extended FDT may be transported as the EFDT element within the Srcflow element, or as an FLUTE FDT-Instance element in TOI=0.
Extension Field	The third portion of a Baseband Packet Header.
Extension Header	An Extension Header is part of the ALP packet header. The presence of an Extension Header depends on the specific fields of the Additional Header.
Extractor	A tool or process that is able to extract audio watermark packets from an audio signal.
FEC Block	A FEC Frame after mapping to cells.
FEC Frame	A single Baseband Packet with its associated FEC parity bits attached, having a total size of 64800 or 16200 bits (per FEC Frame).
Filter Code	An integer which represents a personalization description. Filter Codes are created by broadcasters according to broadcasters' particular personalization categories, such as truck owner, sustaining member, or a zip code. Filter Codes are unique within the scope of an AppContextID described in A/344. Filter Codes may be associated with files.
Fragment	One part of a fragmented ISOBMFF file
Frequency Interleaver	An interleaver which takes cells and interleaves them over a particular symbol.
Header	A sequence of bits that is present at the start of a cell.
High Dynamic Range	A feature that allows representation of video levels with much higher luminance values than is possible with traditional video methods.
(HTTP) File Repair	HTTP transactions between the receiver and a network repair server, conducted over the broadband channel, which enables the receiver to recover partially delivered object(s).
$I(x) \bmod G(x)$	The remainder that results from the polynomial division of $I(x)$ by $G(x)$.
I-Frame	An independently decodable frame
Initialization Segment	Segment containing metadata that is necessary to present the media streams encapsulated in Media Segments.
Inner Code	One code of a Concatenated Code system.

Interlaced HD Interleaver	A specific set of high definition video formats.
Interval Code	A device used to counteract the effect of burst errors.
Large Domain	A value that identifies the interval of content in which the VP1 payload value is embedded.
Latest Time	A division of the VP1 Payload wherein the interval field has a size of 25 bits, sufficient to support watermarking of approximately 1 year, 7 months of content.
Layered Division Multiplexing	A time value that accompanies data sent as input to a Broadcast Gateway to indicate the last instant, as determined using TAI, by which the last byte of related data, including all wrappers and encapsulating protocols, must complete emission on the Physical Layer.
Legacy SD	A multiplexing scheme where multiple PLPs are combined in layers with a specific power ratio.
Linear Audio/Video Service	A specific set of standard definition video formats.
Linear Audio-Only Service	Service consisting of one or more continuous video components, one or more continuous audio components, each associated with one or more of the video components, and one or more closed caption components, each associated with one or more of the audio components, all streamed in real time. May also contain app-based features.
LLS (Low Level Signaling) Locally Cached Content Item	Service consisting of one or more continuous audio components and one or more closed caption components, each associated with one or more of the audio components, all streamed in real time. May also contain app-based features.
Long-term storage	Signaling information which supports rapid channel scans and bootstrapping of service acquisition by the receiver.
Major Channel Number	A collection of one or more Locally Cached Files which are intended to be consumed as an integrated whole. A Locally Cached Content Item is typically not consumed or presented until the requisite Locally Cached Files have been fully received and cached.
Marked Audio Media Delivery Event (MDE)	A location in memory used to store a recording of a program with the intention of playback at a later date and time. This memory is persistent through power cycles of the device.
Media	Part of the identification of a service, as defined in Section 6.3.2 of A/331 as SLT.Service@majorChannelNo. The combination of major and minor channel number is unique within a broadcast area. I.e., a receiver of over-the-air broadcasts will never see two different services with the same major/minor channel number combination.
	Audio that has an audio watermark embedded in it.
	A Media Delivery Event (MDE) is the arrival of a collection of bytes that is meaningful to the upper layers of the stack for example the media player and decoder(s). MDE data blocks have delivery deadlines. The grouping of bytes that is a RAP is a "Delivery" in ROUTE and the arrival of these bytes is an "Event" at an upper layer.
	Collection of essences that establishes a bounded or unbounded

Presentation Media Presentation Description	presentation of media content. Formalized description for a Media Presentation for the purpose of providing a streaming service.
Media Processing Unit	Generic container for independently decodable timed or non-timed data that is media codec agnostic.
Media Segment	A.) A portion of a data Stream that is treated as a unit by a Scheduler for purposes of analysis and Transmission. B.) Segment that complies with media format in use and enables playback when combined with zero or preceding Segments and a Initialization Segment (if any).
Minor Channel Number	Part of the identification of a service, as defined in Section 6.3.2 of A/331 as SLT.Service@minorChannelNo.
MMT Package	Logical collection of media data, delivered using the MMT protocol.
MMT Protocol	Application layer transport protocol for delivering MMTP payload over IP networks.
MMTP Packet	Formatted unit of the media data to be delivered using the MMT protocol.
ModCod	A combination of modulation and code rate that together determine the robustness of the PLP and the size of the Baseband Packet.
MP Table	MMT Package Table containing information on MMT assets/content components.
MPI message	MMT signaling message containing an MPI Table.
MPI Table	MMT table containing presentation information.
MPT message	MMT signaling message containing an MP Table.
Multicast	(Verb) to send data across (e.g., an IPv4) network to many recipients simultaneously; (noun) a set of data sent across (e.g., an IPv4) network to many recipients simultaneously.
Multiplex Network	A group of services that are transmitted together over a Network. A group of Transmitters delivering the same Multiplex.
Network Content Item	A continuous component (e.g., an audio/video clip) or a collection of one or more files (e.g., a slide show or a set of inter-linked HTML pages) that is intended to be consumed as an integrated whole, and that is delivered on demand for immediate presentation. Network Content Items are delivered via broadband and are normally progressively presented prior to receiving the entire file(s).
Network Layer Packet	A Network Layer Packet is a source packet in the protocol of the data to be transported, e.g., an MPEG-2 Transport Stream packet or an Internet Protocol packet.
Non-Uniform Constellation	A constellation with a non-uniform spread of constellation points.
Null Packet	An MPEG-2 TS packet with PID equal to 0x1FFF.
Optional Field	The second portion of a Baseband Packet Header.
Outer Code	One code of a Concatenated Code system.

Packet	A.) A collection of data sent as a unit, including a header to identify and indicate other properties of the data, and a payload comprising the data actually to be sent, either having a fixed known length or having means to indicate either its length or its end. B.) Has the meaning given in the ATSC A/334 Audio Watermark Emission specification.
Packet Set	A group of packets carrying segments of a large data structure that has been segmented for the purpose of carriage across a transport connection that is not configured to carry the large data structure.
Packetizer	A process that treats a collection of data (e.g., a portion of a data Stream) by breaking it into segments and wrapping the segments in a header structure, thereby creating packets for Transmission / delivery.
Paging	The BTS pages for a single terminal in the broadcast network.
Parity	A division of the Cell that carries the BCH code parity check bits.
PCM	Linear Pulse Code Modulation. In this document this is understood to be the uncompressed format for audio signals.
Period	A duration of time.
Personalization	A feature that provides consumers control over the listening experience
Physical Layer	A functional protocol that defines the framing, resource allocation, and waveforms of signals emitted for delivery of data and content to receivers.
Physical Layer Pipe	A structure specified to an allocated capacity and robustness that can be adjusted to broadcaster needs.
PLP (Physical Layer Pipe)	A portion of the RF channel which has certain modulation and coding parameters.
Preamble	A.) The portion of the frame that carries L1 signaling data for the frame. B.) The portion of a Physical Layer frame that carries L1 signaling data for the frame.
Preamble Generator	A function within a Broadcast Gateway that accepts instructions from a Scheduler, creates and formats Preamble Packets according to those instructions, and releases the Preamble Packets in the form of a Preamble Stream that can be multiplexed with other data Streams for delivery to the Transmitter(s) under control of the Broadcast Gateway.
Preamble Packet	A packet of data that provides a complete set of information necessary for Transmission following the Bootstrap of a Physical Layer frame to instruct receivers regarding the necessary receiver data processing to permit recovery of the data contained within the frame. The packet also serves to instruct Transmitters with respect to the configuration of the Physical Layer frame that is to be emitted so that the Exciter data processing for the frame can be properly configured.
Preamble Parser	A function within an Exciter that receives Preamble Streams, extracts from them Preamble Payload data, and stores the Preamble Payload data until the time for its emission as part of a broadcast signal. The

	<p>Preamble Parser then makes the Preamble Payload data available to the Exciter control system for use in configuring the data- and waveform-processing of the Exciter, and outputs individual Preamble Packets at the correct times for their inclusion in the emission of the Physical Layer frames the configurations of which they define.</p>
Preamble Payload	<p>The L1 data carried in a Physical Layer frame to define the structure of the frame and to specify the modulation, coding, and other parameters used in delivery of the frame.</p>
Preamble Stream	<p>A data Stream carrying Preamble Packets, comparable to the data Streams carrying data for PLPs and for Timing and Management functionality, that can be multiplexed with other Streams and delivered as a combined data Stream that is tunneled through the STLTP.</p>
Presentation	<p>A set of one or more AC-4 Substreams intended to be decoded and presented to the user simultaneously. In the context of this document, the term Presentation and the term Audio Presentation as defined in Part 1 of A/341, refer to identical concepts.</p>
Primary Bit Stream	<p>The elementary stream that serves as the entry-point. It carries the default Presentation in a multistream Program</p>
Privileged Application	<p>An application that can override system controls, authorizations, or privileges.</p>
Program	<p>A single content segment</p>
Progressive Video	<p>A specific set of formats.</p>
Protocol Data Unit	<p>The protocol data unit encapsulated in the DRC Uplink MAC layer. The maximum size of a DRC uplink MAC PDU is limited to 2048 bytes.</p>
Query Flag	<p>The value of the query_flag field in an instance of the VP1 Payload.</p>
Random Access	<p>User terminals try to access the system.</p>
Random Access Point (RAP)	<p>A Random Access Point is the starting byte of a sequence of data that allows an applicable media client and decoder to start.</p>
Receiver	<p>The Receiver described in this document refers to an entity that implements the functions of the Reference Receiver Model.</p>
Receiver Web Server	<p>The Receiver Web Server is a conceptual component of a Receiver that provides a means for a User Agent to gain access to files delivered over ROUTE that conceptually reside in the Application Context Cache.</p>
Receiver WebSocket Server	<p>The Receiver WebSocket Server provides a means for a User Agent to gain access to information about the Receiver and control various features provided by the Receiver.</p>
Recovery File	<p>A file containing signaling data about the service being presented including URLs that can be used to access signaling information for supplementary signaling and content.</p>
Recovery File Server	<p>A server that provides Recovery Files to receivers.</p>

Reference Receiver Model	A conceptual receiver device that is capable of executing the APIs and behavior specified in this document. This document specifies normative attributes of the model, which are intended to inform actual receiver implementations.
Reference View	Stereoscopic 3D video component with the spatial resolution equal to or greater than the additional view.
Repair Symbol	A symbol containing information generated by the AL-FEC code which can be used to recover lost source symbols of the transport object.
Representation	A collection and encapsulation of one or more media streams in a delivery format and associated with descriptive metadata
Reserved	Set aside for future use by a Standard.
Resource Block	A resource block is composed of 3 resource tiles that are contiguous in frequency-time dimension or time-frequency dimension.
Resource Tile	Basic unit in an uplink physical frame. One resource tile occupies 20 contiguous subcarriers in the frequency dimension and 2 contiguous symbols in the time dimension, which is equal to 40 cells. Among the cells in one resource tile, 8 of them are used for pilots and 32 are used for data transmission. Each resource tile has an index to represent it, which is numbered according to the position of the resource tile in the uplink frame.
Scalable/Layered Audio	An audio system that uses hierarchical techniques to: (1) Provide increasing quality of service with improving reception conditions, and/or (2) Provide different levels of service quality as required by different device types or presentation environments.
Schedule fragment	Portion of Service Announcement that describes presentation scheduling of content in an ATSC service, corresponding to Schedule fragment in OMA BCAST Service Guide model, with additions and constraints as described in this document.
Scheduler	A Studio side-function that allocates physical capacity to data Streams based on instructions from the System Manager combined with the capabilities of the specific system.
Segment	Unit of data associated with an HTTP-URL and optionally a byte range that are specified by a MPD.
Segment Index	Compact index of the time range to byte range mapping within a Media Segment separately from the MPD.
Server Code	A value that identifies a server which acts as the starting point for acquisition of supplementary content.
Service	A collection of media components presented to the user in aggregate; components can be of multiple media types; a Service can be either continuous or intermittent; a Service can be Real Time or Non-Real Time; Real Time Service can consist of a sequence of TV programs.
Service Announcement	Service Announcement is information regarding the ATSC services and content available.

Service fragment	Portion of Service Announcement that describes ATSC service, corresponding to Service fragment in OMA BCAST Service Guide model, with additions and constraints.
Service Guide	Function of presenting Service Announcement.
Signaling Server	A server that provides access to the Service Layer Signaling (SLS), as specified in Section 7 of A/331.
Single Frequency Network	Multiple Transmitters in proximity to one another radiating the same waveform and sharing a frequency.
SLS (Service Layer Signaling)	Signaling which provides information for discovery and acquisition of ATSC 3.0 services and their content components.
SLT (Service List Table)	Table of signaling information which is used to build a basic service listing and provide bootstrap discovery of SLS.
Small Domain	A division of the VP1 Payload wherein the interval field has a size of 17 bits, sufficient to support watermarking of approximately 54 hours of content.
Source Symbol	A symbol containing information from the transport object.
Spatial Scalable Coding	A method of providing low and high spatial resolution versions of content through use of a base and an enhancement layer
Staggercast	A robustness feature that can be optionally added to audio components consisting of delivery of a redundant version of a main audio component, possibly coded with lower quality (lower bitrate, number of channels, etc.), and with a significant delay ahead of the audio with which it is associated. Receivers that support the Staggercast feature can switch to the Staggercast stream should main audio become unavailable. The delivery delay between Staggercast audio and main audio is chosen to be high enough to provide robustness thanks to sufficient time diversity between the two.
Standard Frame Rate	A picture frequency lower than or equal to 60 pictures per second.
STL Interface	The STL Interface is the origin point for the Studio-to-Transmitter Link Tunneling Protocol (STLTP).
Stream	A sequential set of packets carrying data from a Data Source to one or more Data Consumers.
Stream Access Point	Position in a Representation enabling playback of a media stream to be started using only the information contained in Representation data starting from that position onwards (preceded by initializing data in the Initialization Segment, if any)
S-TSID (Service-based Transport Session Instance Description)	An SLS XML fragment which provides the overall session description information for transport session(s) which carry the content components of an ATSC 3.0 service.
Studio Interface	The Studio Interface is the termination point for the ALP Transport Protocol (ALPTP) and/or the Data Source Transport Protocol (DSTP).
Subsegment	Unit within Media Segments that is indexed by a Segment Index.
Substream	A part of an AC-4 elementary stream that contains audio data and/or

	corresponding metadata. A Substream is referenced by one or more Presentations.
Symbol	A.) A unit of data processed by an FEC code; e.g., N bytes of data. A symbol is always considered as a unit—i.e., it is either completely received or completely lost. B.) The representation of a bit of binary information in the audio watermark.
System Manager	The System Manager is a conceptual subsystem outside the Transport and Physical Layers and responsible for coordinating the functions of at least those two layers and the static and quasi-static configurations of various system aspects, for example definition of PLPs or assignment of IP addresses and port numbers to Services. The System Manager does not manage real-time traffic directly.
Systematic	A property of a code in which the code word is composed of the original data in its sequential order followed by the parity data for the code word.
TI Block	An integer number of FEC Blocks.
Time Interleaver	An interleaver which takes cells and interleaves them over a particular time period.
Time-shift-buffer	A buffer of memory used to record a temporary, fixed duration of the program being presented for the purposes of skipping ahead, skipping back, pausing, or resuming playback of a broadcast.
Timing and Management Data	A collection of data sent from a Timing and Management Generator in a Broadcast Gateway to the Transmitter(s) under control of the Broadcast Gateway for purposes of controlling the emission times of Physical Layer frames, establishing various Transmitter configurations, and setting various Transmitter parameters, independent of the configurations of the frames and waveforms of the emitted signal itself.
Timing and Management Generator	A function within a Broadcast Gateway that accepts instructions from a Scheduler, creates and formats Timing and Management Data according to those instructions, and releases the Timing and Management Data in the form of a Timing and Management Stream that can be multiplexed with other data Streams for delivery to the Transmitter(s) under control of the Broadcast Gateway.
Timing and Management Stream	A data Stream carrying Timing and Management Data, comparable to the data Streams carrying data for PLPs and for Preambles, that can be multiplexed with other Streams and delivered as a combined data Stream that is tunneled through the STLTP.
Track	A collection of related samples in an ISO base media file. For media data, a Track corresponds to a sequence of images or sampled audio.
Transcoding	The process by which audio that is represented in one encoding format is converted into another encoding format. This is typically achieved by decoding the audio from the first encoding format to PCM audio, followed by encoding of the PCM audio into the destination format.
Transmission	The signal that is emitted by a Transmitter and the synchronized signal

	that is emitted by all Transmitters in a Network.
Transmitter	An individual emitter at a specific geographic location on a specific frequency.
Transport Block	The minimum channel coding block for uplink communications. The size of a transport block is determined by the number of allocated tiles for a user and the coding scheme. Referring to Table 5.5 of A/323, the maximum number of information bits transmitted by a transport block can be 96, 144, 192, 288, 384, 432, 576, or 864. When the size of a MAC PDU is less than or larger than this limitation, padding or segmentation, respectively, shall be used.
Transport Layer	A functional protocol that defines the formatting of data that will be delivered to receivers after its recovery from the formatting required for its physical delivery by the Physical Layer. It provides logical communication between application processes running on different hosts within a layered architecture of protocols and other network components.
Transport Media Delivery Event (T MDE)	A Transport Media Delivery Event is a Media Delivery Event wrapped in IP/UDP/ROUTE.
Transport Random Access Point (T RAP)	A Transport Random Access Point (T-RAP) is the first byte of a Random Access Point as expressed in IP/UDP/ROUTE transport.
Tunnel Packet	A packet that carries in its payload the contents of one or more multiplexed packet Streams, including the corresponding headers and any other structural elements, i.e., a packet in the “outer” layer of a packet Tunneling system.
Tunneled Data Stream	A Stream of multiplexed Tunneled Packets carried within an STLTP encapsulation for ECC processing.
Tunneled Packet	A packet within a multiplexed group of packet Streams carried in a Tunnel Packet, i.e., a packet in the “inner” layer of a packet Tunneling system.
Tunneling	A process by which a group of parallel and independent packet Streams are carried within a single packet Stream so that they can be processed, transported, and otherwise treated as a single Stream entity.
Tuple	The combination of Internet Protocol (IP) addresses and port numbers.
Twisted Block Interleaver	An interleaver that performs intra-subframe interleaving by interleaving TI Blocks.
USBD/USD (User Service Bundle Description / User Service Description)	The XML-based SLS fragment which provides entry point information for the description and discovery of the technical details of an ATSC 3.0 service.
User Agent	Software provided by the Receiver that retrieves and renders Web

VP1	content. The User Agent interprets HTML5, CSS, and JavaScript, renders media, text, and graphics, and can create user interaction dialogs. The audio watermarking technology standardized in the ATSC A/334 Audio Watermark Emission specification.
VP1 Audio Watermark Segment	A continuous interval of watermarked audio during which signaling information recovered via audio watermark Payloads is applicable.
VP1 Message Group	A sequence of video frames, each carrying a vp1_message, each carrying identical data repeated for all successive video frames across at least a 1/6 second duration of content.
VP1 Payload	The specific arrangement of the 50-bit VP1 payload in domain_type, server_field, interval_field, and query_flag specified in the present document.
VP1 Video Watermark Segment	A continuous interval of time that contains watermarked video during which signaling information recovered via vp1_message ()s is applicable.
VP1 Watermark Segment	A VP1 Video Watermark Segment or a VP1 Audio Watermark Segment.
Wakeup Alert	The occurrence of an AEA message requesting the setting of a non-zero value for the Emission Wakeup Field.
Wakeup Bits	The bits in Bootstrap Symbols 1 and 2 that are used to indicate to receivers that there is high-priority emergency information included in the broadcast.
Web Application	A Web Application is a client/server program accessed via the web using URLs. The client-side software is executed by a User Agent.
Wide Color Gamut	A feature that allows representation of chrominance levels with much broader range than is possible with BT.709.

Pop Quiz to follow.