Panel Discussion: A Deep Dive into 3.0

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The Panel

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OVERVIEW OF ATSC 3.0

ATSC 1.0 Standard

ATSC 1.0 (A/53)

- First digital broadcasting standard
- High-definition video
- Multicasting capabilities
- 5.1 digital surround sound
- Electronic program guides
- Closed captioning services
- Extensibility

DTV was revolutionary in 1995!

…Now 20+ years later…

Today: Rapidly Advancing Technologies

Consumer Demands are Changing

OTA viewership is growing

OTT services and usage are growing

Mobile viewing continues to increase

The cord cutting / shaving / nevers are changing the TV marketplace dynamics

On-demand viewing is an assumed feature

Digital advertising is increasingly powerful

Targeted advertising is essential today

Consumers have become “app-centric”

ATSC 3.0: Consumer Driven

Demand exists for higher resolution images and sound

- Major improvements have been made in video and audio compression efficiencies

Spectrum is becoming increasingly scarce

- Not just in the U.S., but worldwide

Delivery paths other than broadcast have become commonplace

- OTT

Personalization and interactivity have become expected by consumers

- “My content when I want it and how I want it”

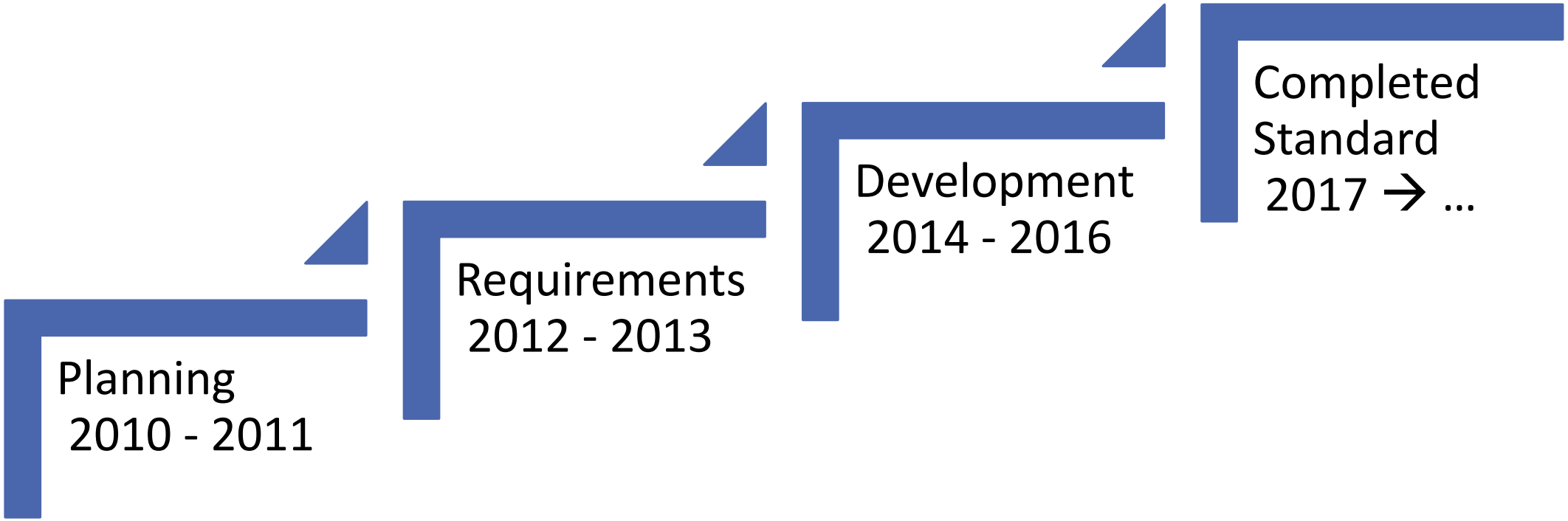
Better audience measurement accuracy is needed and expected by advertisers

- Web-level details are expected

ATSC 3.0 Basic Use Cases

Flexible use of spectrum	Robustness	Mobile services	UHD video	Hybrid services
Multi-view / multi-screen	3D content (video)	Enhanced and immersive audio	Advanced accessibility	Advanced emergency alerting
	Personalization / interactivity	Advanced advertising / monetization	Common world standard	

The Path to ATSC 3.0



Schedule

ATSC 3.0 is a suite of standards

- One or more standards per layer
- Each standard moves through the process independently

Final approval of the core elements of ATSC 3.0 is expected by the end of 2017

FCC considering change in rules to authorize use of ATSC 3.0

ATSC 3.0 has been implemented in South Korea

- Nationwide network switched on in May
- Full coverage of 2018 Olympics in 4K

U.S. broadcasters are planning their transition scenarios

- Synergy with the repack is likely


ATSC 3.0 Standards Update
October 2017
DRAFT STANDARDS
A/323 Physical Layer Uplink
CANDIDATE STANDARDS
A/324 Scheduler/Studio to Transmitter Link
A/337 Application Signaling
A/344 Interactive Content
PROPOSED STANDARDS
A/300 ATSC 3.0 System
A/331 Signaling, Delivery, Sync, Error Protection
A/360 Security and Service Protection
FINALIZED STANDARDS
A/321 System Discovery and Signaling
A/322 Physical Layer Protocol
A/325 Lab Performance Test Plan (RP)*
A/326 Field Test Plan (RP)*
A/330 Link Layer Protocol
A/332 Service Announcement
A/333 Service Usage Reporting
A/334 Audio Watermark Emission
A/335 Video Watermark Emission
A/336 Content Recovery in Redistribution Scenarios
A/338 Companion Device
A/341 Video – HEVC
A/342 Part 1 Audio Common Elements
A/342 Part 2 Audio: AC-4 System
A/342 Part 3 Audio: MPEG-H System
A/343 Captions and Subtitles
*Recommended Practice
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Advanced Emergency Alerting (AEA)

Next step in robust delivery of emergency information to the public

- Provides a more robust and reliable public warning and safety information communications system
  - Independent of cellular network congestion
- Leverage broadcaster's major role as a public information provider with disaster-resistant facilities
- Offload data and video traffic during times of emergency to preserve LTE for what it does best – point-to-point text and voice communications

Opportunity for broadcasters

- Enhance the station's brand for weather, essential information, and public service in times of emergency
- Provide a pipeline for extensive information beyond simple text, for disaster preparation and recovery, in addition to acute warnings

AEA Features

ATSC 3.0 and AEA are designed to reach many types of receivers

- Fixed, portable, mobile, handheld
- ATSC 3.0 specifies an optional robust-level AEA wake-up signal for all types of receivers in “sleep” mode

The emission standard enables receivers to present

- Primary text alert message displayed as banner or crawl overlay
- Audio announcement of primary alert messages

Alert messages are capable of targeting receivers in specific geographic locations

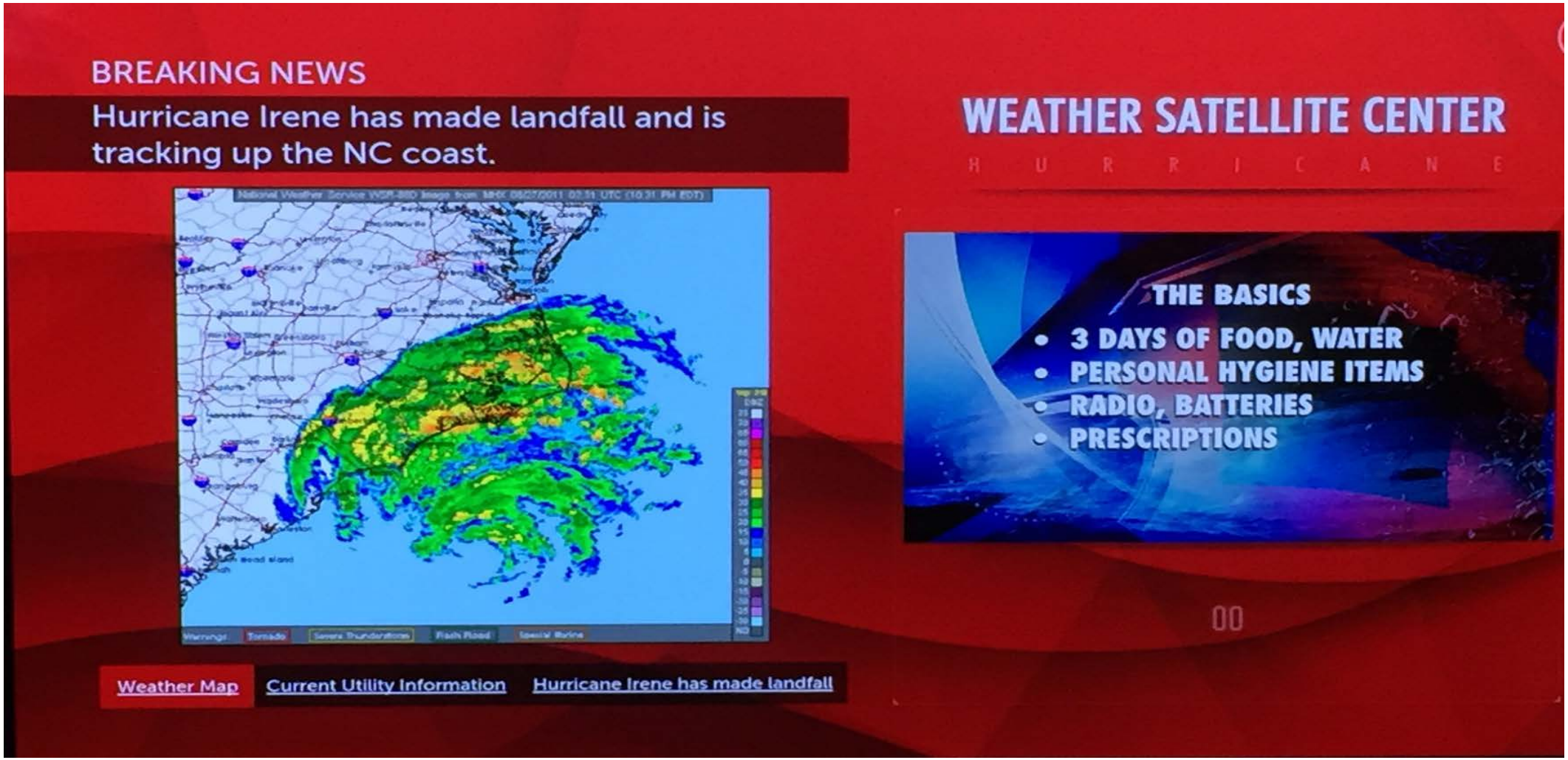
- Works with receivers that “know where they are”

AEA supports optional delivery of multiple types of rich media content in support of enhanced alerting

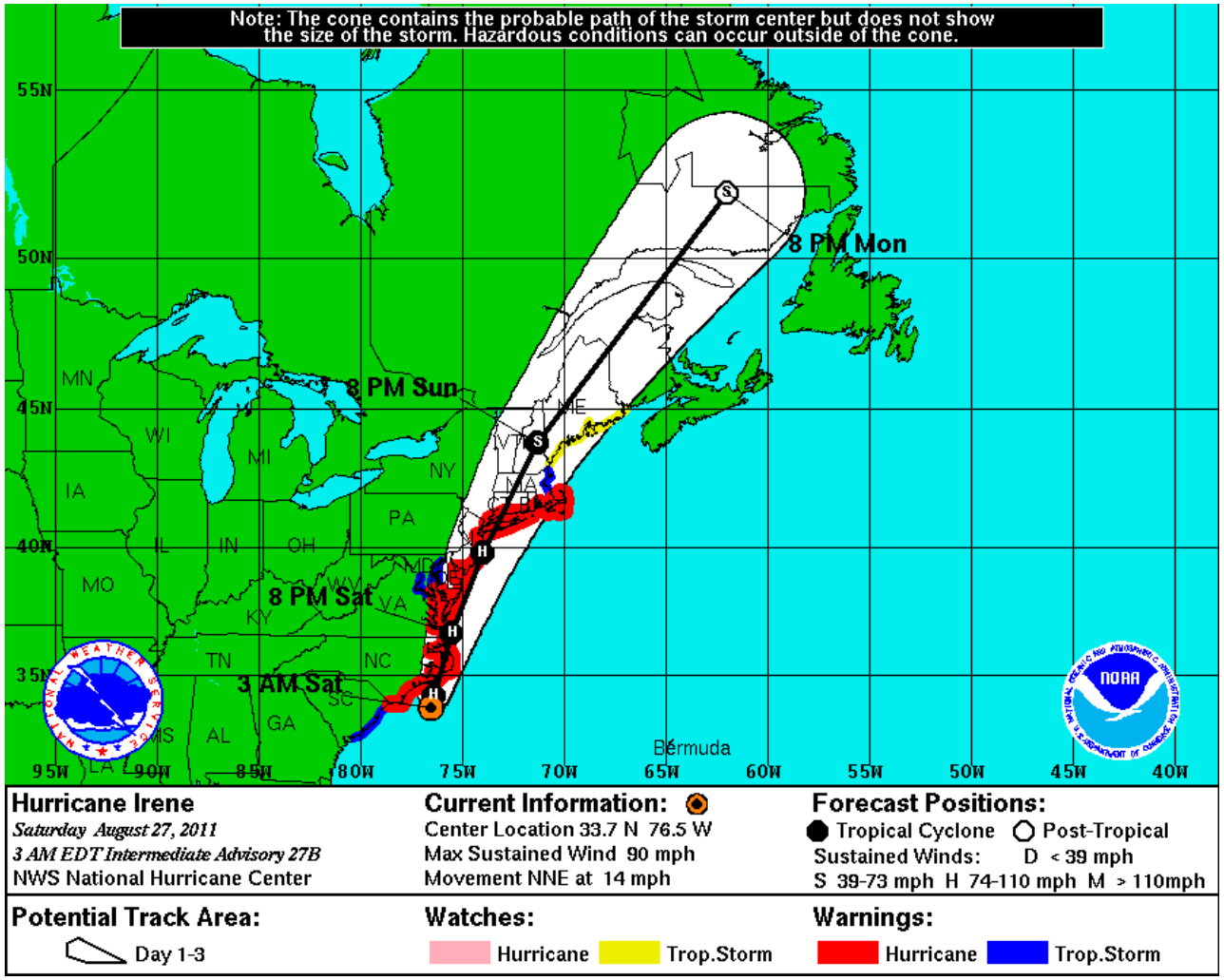
- File- and stream-based rich media, including:
  - Weather radar, evacuation routes, live news and weather reporting, instructions for what to do

AEA Rich Media Content

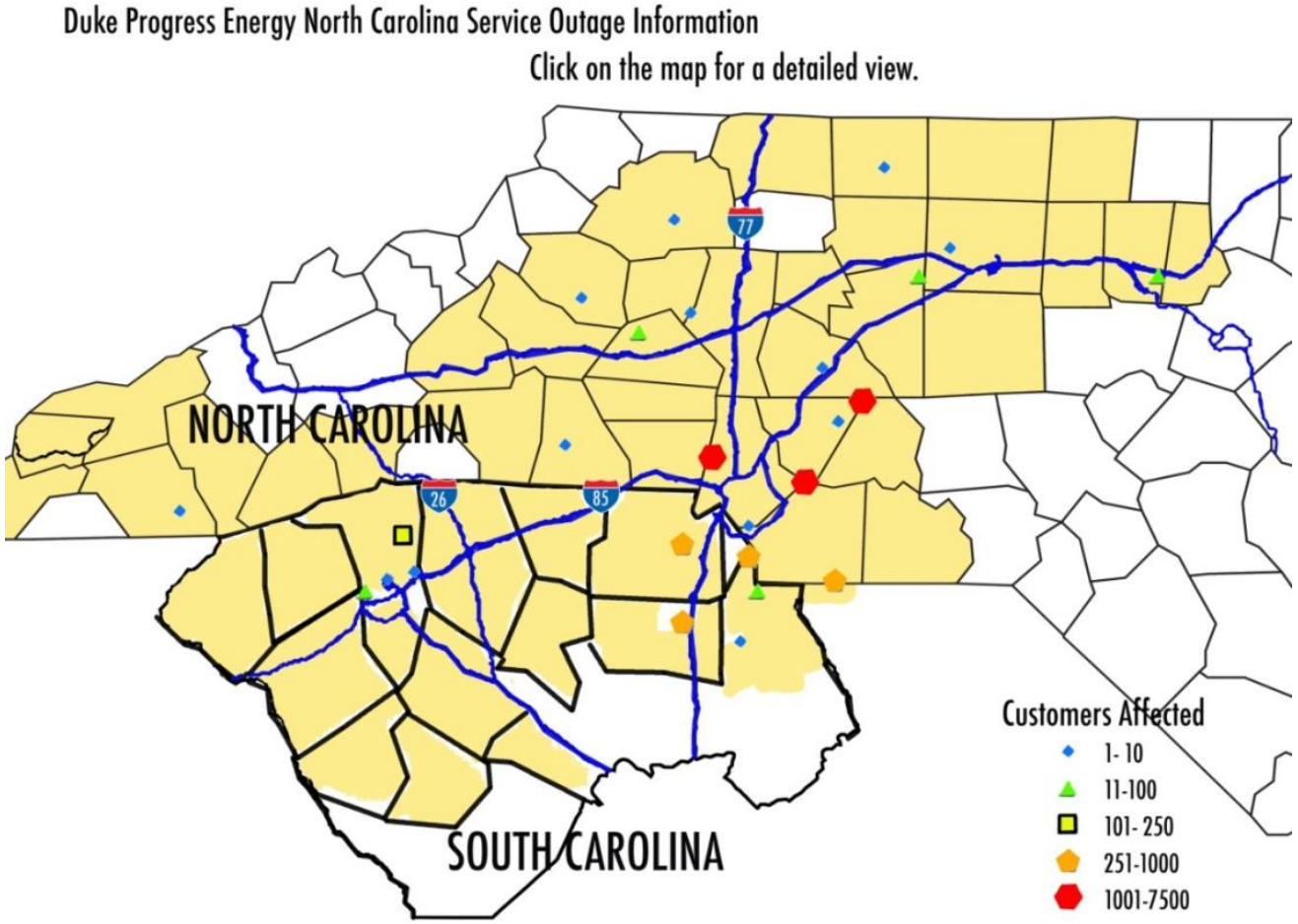
AEA Integrated Content



AEA Graphics Content



AEA Informational Content



Advanced Emergency Alert Table contains the elements and attributes of the alerting messages.

AEAT elements and attributes can be further defined by code values.

Who gets it

When

Where

Alert Narrative

Live Media

Media Resources

Element or Attribute Name	Use	Data Type	Short Description
AEAT			Root element of the **AEAT**
AEA	1..N		Advanced Emergency Alert formatted as AEA-MF.
@AEAid	1	string	The identifier of AEA message.
@issuer	1	string	The identifier of the broadcast station originating or forwarding the message.
@audience	0..1	string	The intended distribution of the AEA message.
@AEAtype	0..1	string	The category of the message.
@refAEAid	0..1	string	The referenced identifier of AEA message. It shall appear when the @AEAtype is "update" or "cancel".
@priority	1	unsignedByte	The priority of the message
Header	1		The container for the basic alert envelope.
@effective	1	dateTime	The effective time of the alert message.
@expires	1	dateTime	The expiration time of the alert message.
EventCode	1	string	A code identifying the event type of the AEA message.
@type	0..1	string	A national-assigned string designating the domain of the code (e.g. SAME in US, …)
EventDesc	0..N	string	The short plain text description of the emergency event (e.g. "Tornado Warning" or "Tsunami Warning".
@lang	1	string	The code denoting the language of the respective element of the EventDesc
Location	1..N	string	The geographic code delineating the affected area of the alert message
@type	1	string	A national-assigned string designating the domain of the code (e.g. FIPS in US or "SGC" in Canada…)
AEAtext	1..N	string	Contains the specific text of the emergency notification
@lang	1	language	The code denoting the language of the respective element of the alert text
LiveMedia	0..1		
@bsid	1	unsignedShort	Identifier of the Broadcast Stream contains the emergency-related live A/V service.
@serviceId	1	unsignedShort	Integer number that identifies the emergency-related A/V Service.
ServiceName	0..N	string	A user-friendly name for the service where the LiveMedia is available
@lang	1	string	The language of the text described in the ServiceName element
Media	0..N		Contains the component parts of the multimedia resource.
@lang	0..1	language	The code denoting the language of the respective element **Media**
@mediaDesc	0..1	string	Text describing the type and content of the media file
@url	1	anyURI	The identifier of the media file
@contentType	0..1	string	MIME-Type of media content referenced by Media@url
@contentLength	0..1	unsignedLong	Size in bytes of media content referenced by Media@url

Key Accessibility Features

ATSC 3.0 brings new public service capabilities

- Robust audio and closed-caption transmission, even when picture fails
- Improved audio intelligibility for hearing impaired
- New features for improved dialog / narrative intelligibility (track-specific volume control)
- Continued support for video description services

ATSC 3.0 feature set supports

- Visually Impaired (VI)
  - Video Description
- Hearing Impaired (HI)
  - Closed Caption
  - Closed Signing
  - Dialog Intelligibility
- Emergency alerts and messaging
  - Emergency crawls and audio tracks

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