ATSC 3.0 Update to W3C

26 October 2015

Background

- ATSC 1.0 – first generation broadcast TV standard
- ATSC 2.0 – backwards-compatible physical layer transport, signaling, and codecs – adding:
  - New A/V codecs
  - Non-real time file delivery
  - Interactivity services
    - Leveraged OIPF Declarative Application Environment (DAE)
- ATSC 3.0 - next generation broadcast TV
  - Technology design started in late 2011
  - Backwards-compatibility is not a requirement
    - Clean break from ATSC 1.0 possible

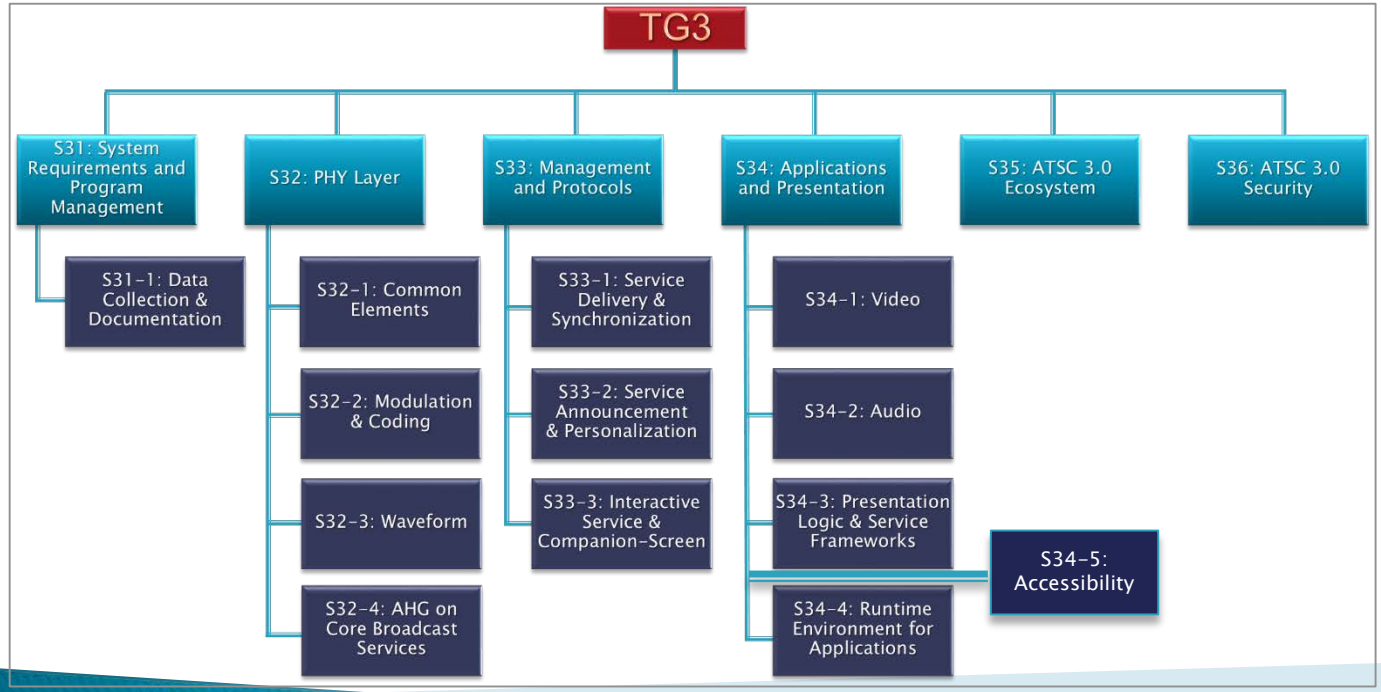
Background – Critical Areas

- Increasing peak throughput, robustness and spectral efficiency at Physical Layer
- Leveraging audio/video codec evolution
  - HEVC/UHD
  - New, immersive audio codecs
- New transport layer – IP-based with 2 options:
  - ROUTE – Real Time Object Delivery over Unidirectional Transport
    - Leverages FLUTE (RFC 6726)
  - MMT - MPEG Multimedia Transport
- New runtime environment
  - Moving beyond the DAE (Declarative App. Environment)
  - Based mostly on existing deployed technology
- Hybrid services
  - Leveraging combined broadcast and broadband connections

Benefits of IP Transport

- Broadcasting no longer an independent silo
  - Take advantage of evolution speed of Internet
- Broadcast & Broadband as peer delivery mechanisms
  - Enables new types of hybrid services
  - Ability to seamlessly incorporate niche content
- Enable new business models
  - Localized Insertion
    - Ads or other content
    - Allows revenue model for broadcasters that has been available to cable or IPTV operators

ATSC 3.0 Organization



Plus:

TG3-5 AHG on Time

TG3-6 AHG on DASH-IF (DASH Interop)

TG3-7 AHG on Extensibility

Technology Group

Specialist Group

Ad-Hoc Group

ATSC 3.0 Transport Layer

- It was decided early in the process to support IP for broadcast transport
- Two modes of operation have been adopted for ATSC 3.0 – ROUTE and MMT
  - Both may be used for streaming services
    - ROUTE leverages DASH for media segmentation/encapsulation and is a broadcast-optimized derivative of FLUTE (RFC 6726)
    - MMT uses MPEG-defined MPU (media processing units)
  - "non real-time" content (e.g., interactive apps, targeted ads to cache locally, etc) is exclusively delivered via ROUTE

ATSC 3.0 Transport Layer (cont.)

- Both modes leverage hybrid delivery
  - Use of UTC for synchronization
  - Streaming services over broadband must be DASH formatted

Relevant W3C Technology

- TTML
  - IMSC1 Profiles used for captions & subtitles
  - Extensions under liaison discussion with TTWG:
    - 3D disparity
    - HDR/WCG
- HTML5 including:
  - APIs

Runtime Environment Overview

- Includes technology from:
  - HbbTV 2.0
  - OIPF
  - HTML5
  - ATSC 2.0 (HbbTV 1.5)
- Constraints/extensions as needed
- Based on OIPF DAE, but with additional HTML5 technologies also addressed
  - Extensions to OIPF Web Profile

Relevant W3C Technology - APIs

- Additions to OIPF Web Standards TV Profile (i.e. leveraging W3C standards) including:
  - Geolocation
  - MSE
  - EME
  - Touch Events
- TV Control API (W3C CG work being investigated)
- Additional API sets identified and being refined

Going Forward

- Continue collaboration with TTWG
- Establish regular communication between Web & TV IG and ATSC
  - Task force under IG?
  - Assist in our evaluation of the Tuner Control APIs
- Expectation for ATSC 3.0 to achieve publication in 2016