ATSC 3.0 Update

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First Generation DTV Systems

ATSC etc.
- Constrained
- Maxed-Out
- Inefficient
- Fixed
- TV-Centric
What if? ...*what might be possible?*

ATSC 3.0
- Configurable
- Scalable
- Efficient
- Interoperable
- Adaptable
System Layers and Specialist Groups

<table>
<thead>
<tr>
<th>Specialist Group</th>
<th>Description</th>
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<tr>
<td>S37, Conversion / Redistribution</td>
<td>Conversion and redistribution of ATSC 3.0 signals for MVPDs</td>
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<td>S36, Security</td>
<td>Service and content protection</td>
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<td>S34, Applications / Presentation</td>
<td>Software, pictures, and sound</td>
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<td>S33, Management / Protocols</td>
<td>Organizing bits into files, streams, and packets</td>
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<tr>
<td>S32, Physical</td>
<td>Sending bits over the RF channel</td>
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<td>S31, System Requirements</td>
<td>Use Cases, Requirements, and overall program management</td>
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ATSC 3.0 Reaches “Mainstream Status” at NAB 2017

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South Korea launches Broadcast UHDTV with ATSC 3.0
What we’ve achieved

• **Extensibility / Flexibility**
  – Bootstrap (A/321) – starting point
  – Possible to evolve system/physical layer
    • Announces technology used in each frame
  – Layers signal technologies to layer above
  – Allows graceful evolution over time
What we’ve achieved

• Extensibility / Flexibility

• Physical Layer that meets broadcasters needs/plans
  – Close to Shannon Limit
  – TDM/FDM/LDM
  – Multiple PLPs
  – SFN
  – Lots of knobs to turn
What we’ve achieved

- Extensibility / Flexibility
- Physical Layer that meets broadcasters needs/plans

**Smart Media Delivery**
- Broadcast IP Transport
- Segmented streaming delivery
- Hybrid – combined broadcast & broadband delivery
- Realtime & NRT
What we’ve achieved

• Extensibility / Flexibility
• Physical Layer that meets broadcasters needs/plans
• Smart Media Delivery

• **Enhanced Story-Telling**
  – UHD: 4K, HDR, WCG, HFR, Scalability
  – Fully immersive Audio
  – Personalized audio
  – HTML 5 based interactivity
What we’ve achieved

• Extensibility / Flexibility
• Physical Layer that meets broadcasters needs/plans
• Smart Media Delivery
• Enhanced Story-Telling
• **System that meets public service needs**
  – Accessibility: Closed Captioning, Open Captioning, Descriptive Video
  – Advanced Emergency Alerting
    • Geotargetting & rich media
What we’ve achieved

• Extensibility / Flexibility
• Physical Layer that meets broadcasters needs/plans
• Smart Media Delivery
• Enhanced Story-Telling
• System that meets public service needs

• **Security**
  – CA & DRM
  – Secure broadband communications
  – Application signing
  – Signing of signaling
What we’ve achieved

• Extensibility / Flexibility
• Physical Layer that meets broadcasters needs/plans
• Smart Media Delivery
• Enhanced Story-Telling
• System that meets public service needs
• Security
• Part of the 5G eco-system
  – P2MP, IoT, high speed, ultra-reliable, lifeline communications…
Why Do We Need This?

OPPORTUNITY!
Questions?

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