NEXTGEN TV and Other Trends

Brian Markwalter
SVP, Research & Standards
Produced by SMPTE and SBE with support from the NAB and ATSC

and the support of our host, WETA Television
Event Recording courtesy of the following sponsors:

NextgenTV Summit

Telestream

Panasonic
THANK YOU TO THE SMPTE DC, SBE AND NAB TEAM MEMBERS WHO PRODUCED THIS EVENT

Fred Willard Univision
Rick Singer Singer Media Engineering
Skip Pizzi NAB
Tom Hackett Diversified Systems
Melissa Davis Evertz
Louise Shidler Chesapeake Systems
Maciej Ochman CPB
James Snyder US Library of Congress
Nephi Griffith BMG
Greg Smalfelt Ch 16 Fairfax
Alex Snell BCI Digital
Peter Wharton Happy Robotz

WITHOUT THEIR VOLUNTEER EFFORTS THIS SUMMIT WOULD NOT BE POSSIBLE
<table>
<thead>
<tr>
<th>Morning Program</th>
<th>Afternoon Program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8:00 AM - 9:00 AM</strong></td>
<td><strong>01:25 PM - 01:45 PM</strong></td>
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</tbody>
</table>
| Registration and continental breakfast | Protecting the NextGen TV Consumer  
Advanced EAS and AWARN Capabilities  
John McCoskey, SpectraRep |
| **8:55 AM - 9:00 AM** | **01:45 PM - 02:15 PM** |
| Welcome from SMPTE, SBE and AES  
Fred Willard, SBE Washington  
Kishore Persaud, SBE Baltimore | Monetizing the NextGen TV Consumer  
Addressable Advertising and Analytics  
Rick Ducey & Mark Fratnik, BIA |
| **9:00 AM - 9:05 AM** | **02:20 PM - 03:20 PM** |
| Introduction | Personalizing the Consumer Experience  
Interactive and Personalized Features  
Mark Corl, Triveni Digital |
| **9:05 AM - 9:35 AM** | **03:25 PM - 03:40 PM** |
| Lynn Claudy, SVP Technology, NAB and Chairman, ATSC Board of Directors  
Madeleine Noland, President, ATSC | Afternoon Break |
| **9:35 AM - 10:00 AM** | **03:40 PM - 04:10 PM** |
| Lynn Claudy, SVP Technology, NAB and Chairman, ATSC Board of Directors  
Madeleine Noland, President, ATSC | The Consumer Out-of-Home Experience  
Mobile & Automotive Applications and FeMBMS (5G Broadcast)  
Thomas Janner, Product Management & R&D Director, Rhode & Schwarz |
| **10:00 AM - 10:35 AM** | **04:10 PM - 04:35 PM** |
| Peter Wharton, SMPTE Membership VP  
Chris Lane, Chief Engineer, WETA | The ATSC 3.0 Roadmap  
Lynn Claudy, SVP Technology, NAB and Chairman, ATSC Board of Directors  
Madeleine Noland, President, ATSC |
| **10:35 AM - 11:15 AM** | **04:35 PM - 05:00 PM** |
| John Lynch, ERI  
Jeff Andrew, Osborn Engineering | The Consumer Technology Roadmap  
Brian Markwalter, SVP Research and Standards  
The Consumer Technology Association |
| **11:15 AM - 11:30 AM** | **05:00 PM - 6:00 PM** |
| Content Reception Enhancements  
Richard Lhermitte, VP Solutions and Market Dev, ENENSYS TeamCast | Station Group and Industry Deployment Plans  
Advanced Capability Implementation Strategies  
Skip Pizzi, VP Technology Education & Outreach, NAB (Moderator)  
Michael Bouchard, VP Technology Strategy, ONE Media / Sinclair  
Stacey Decker, CTO, Public Media Group  
Sasha Javid, COO, The Spectrum Co |
| **11:30 AM - 11:50 AM** | **06:00 PM - 8:00 PM** |
| Consumer Applications for Combined 5G & NextGen TV Networks  
Josh Arensberg, M&E Business Development, Verizon Media | Cocktail Reception  
Busboys and Poets  
4251 S. Campbell Ave., Shirlington  
Heavy Hors d’oeuvres and open bar |
| **11:50 AM - 12:15 PM** | **6:00 PM - 8:00 PM** |
| Case Study: Hybrid Services at "Chicago 3.0"  
Jean Macher, Harmonic | **08:00 PM - 09:00 PM**  
Registration and continental breakfast |
| **12:15 PM - 01:20 PM** | **09:00 PM - 09:30 PM** |
| Buffet Lunch | **09:30 PM - 10:00 PM**  
Networking and Socializing |
| **01:25 PM - 01:45 PM** | **09:30 PM - 10:00 PM** |
| **01:45 PM - 02:15 PM** | **09:30 PM - 10:00 PM** |
| **02:20 PM - 03:20 PM** | **09:30 PM - 10:00 PM** |
| **03:25 PM - 03:40 PM** | **09:30 PM - 10:00 PM** |
| **03:40 PM - 04:10 PM** | **09:30 PM - 10:00 PM** |
| **04:10 PM - 04:35 PM** | **09:30 PM - 10:00 PM** |
| **04:35 PM - 05:00 PM** | **09:30 PM - 10:00 PM** |
| **05:00 PM - 6:00 PM** | **09:30 PM - 10:00 PM** |
| **06:00 PM - 8:00 PM** | **09:30 PM - 10:00 PM** |
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A CES Flyover
Personalization

Privacy

Intelligence

CES 2020 News: Tech Executives Answer Tough Questions About Privacy

Apple, Facebook, and Procter & Gamble executives discussed privacy, encryption, and digital advertising at CES 2020
Video Trends
2019 US TV HH Penetration Rates
% of US Households Owning at Least One Product

SMART: 56%
HDR: 16%
OVERALL: 95%
40-59": 67%
60-69": 25%
70": 3%

Source: CTA, Consumer Technology Ownership and Market Potential Study, 2019
Fewer TVs Per US Owner Household

US Market – Avg. # of TVs Per Owner Household

Source: CTA, Annual Consumer Technology Ownership and Market Potential Studies
2019 Top Planned Consumer Tech Purchases
% of U.S. HHs Planning to Purchase

#1 38%  Smartphone
97% repeat purchase

#2 27%  Wireless earbuds
59% repeat purchase

#3 26%  Television (any)
95% repeat purchase

#4 25%  Wired earbuds
84% repeat purchase

#5 24%  Notebook, laptop or netbook
81% repeat purchase

Source: CTA, Consumer Technology Ownership and Market Potential Study, 2019
LCD TV Average Screen Size
U.S. Market - Analog and Digital Sets Combined in Inches

Source: CTA Research
Overall TV Volume: Short-Term Growth

US Market – Unit Shipments (millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth</th>
<th>Units (millions)</th>
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<tbody>
<tr>
<td>2018</td>
<td>4%</td>
<td>38.2</td>
</tr>
<tr>
<td>2019</td>
<td>2%</td>
<td>39.8</td>
</tr>
<tr>
<td>2020</td>
<td>1%</td>
<td>40.7</td>
</tr>
<tr>
<td>2021</td>
<td>0%</td>
<td>41</td>
</tr>
<tr>
<td>2022</td>
<td>0%</td>
<td>41.1</td>
</tr>
<tr>
<td>2023</td>
<td>0%</td>
<td>41.1</td>
</tr>
</tbody>
</table>

Source: CTA Research, CTA Sales & Forecast January 2020
4K UHD TV – All Techs

US Market – Unit Shipments (000s)

% of Total TV that are 4K UHD

Source: CTA Research
8K UHD TV – All Techs

US Market - Unit Shipments (000s)

Growth:

<table>
<thead>
<tr>
<th>Year</th>
<th>Shipments (000s)</th>
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<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>201</td>
<td>504</td>
<td>936</td>
<td>1,672</td>
<td>2,498</td>
</tr>
</tbody>
</table>

Growth: 151% 86% 79% 49%

Source: CTA Research, CTA Sales & Forecast January 2020
New Industry-Approved "NEXTGEN TV" Name, Logo Will Distinguish ATSC 3.0-Enabled Tech Devices

by Danielle Cassagnol:

Tyler Suiders

In advance of ATSC 3.0 IP-enabled broadcast transmission in 2020, the Consumer Technology Association (CTA)® today announced "NEXTGEN TV" as the go-to-market name for this groundbreaking television technology. In coordination with broadcasting companies, device manufacturers and standards engineers at CTA's Technology & Standards Fall Forum, the association also unveiled the NEXTGEN TV logo for devices meeting newly developed ATSC 3.0 interoperability test specifications.
NextGen TV for 4K TV Broadcasting Officially Launches at CES 2020

It is expected that NextGen TV will roll out to more than 60 markets in the U.S., covering more than 70 percent of the population.

STEWART WOLPIN - 6 DAYS AGO

One of the constant consumer complaints about 4K TV is the lack of broadcast 4K content. This complaint will slowly be addressed this year with the official launch of NextGen TV, the consumer-facing name for the ASTC 3.0 broadcast standard that enables 4K UHD broadcasting.

Samsung Electronics announced today that its new 4K and 8K TVs incorporating ATSC at CES, a total of 20 models to start 2020, noted Madeleine Noland, president of ATSC. It is expected that NextGen TV will roll out to more than 60 markets in the U.S., covering more than 70 percent of the population. “Broadcasters are moving forward with unprecedented enthusiasm and cooperation,” Noland noted.

LG, Samsung, and Sony all announced new 4K and 8K TVs incorporating ATSC at CES. President of the Visual Display Business at Sami at-home viewing experience for our 2020 QLED steers our broadcast partners into developing cc to scratch the surface and are excited about the
Going to Market with NEXTGEN TV

Conformance

- ATSC
- CTA + NAB
- Pearl

Logo

- ATSC tasked CTA with logo development
Two rounds of ideation and consumer research to select NEXTGEN TV name and logo

For use with consumer TVs and receivers that pass the NEXTGEN TV Test Suite
- developed by Eurofins for CTA and NAB
Why a NEXTGEN TV Logo?

• Support adoption and consumer recognition
• Signify device compliance
• Hint at the benefits of the ATSC 3.0 technology
FROM THE SMPTE WASHINGTON DC SECTION

THANK YOU