

Unofficial Notes:

NAB Show New York

**October 17-18, 2018
Javits Convention Center
New York City**



NOTICE: These notes were taken live at the NAB Show New York from October 17-18, 2018 at the Javits Convention Center in New York City. They are a good faith representation of our impressions of the events and what was said by participants. However, we cannot guarantee the accuracy of any specific comment. They are not endorsed by NAB Show New York in any way. This document is not a recommendation to buy or sell any security. Please consult with appropriate professional advisors before making significant business decisions. Corrections welcome.

Executive Summary

Members of Summit Ridge Group attended the NAB Show New York on October 17, and 18, 2018, at the Javits Convention Center in New York City.

The NAB Show New York is produced by the National Association of Broadcasters. The focus of the NAB Show New York is next-generation technology for media, entertainment and telecom professionals, with conferences and workshops focused on television, film, satellite, online video, live events, podcasting, advertising, corporate A/V, production and post. The show was filled with solid presentations and detailed discussions about a range of issues impacting the broadcasting industry.

A key factor affecting the telecommunications and media industry is the use of available spectrum. These notes are therefore focused on presentations related to the ATSC 3.0 digital television system.

ATSC 3.0 is a suite of voluntary technical Standards and Recommended Practices that is fundamentally different from predecessor ATSC systems and is therefore largely incompatible with them. This divergence from earlier design is intended to allow substantial improvements in performance, functionality, and efficiency sufficient to warrant implementation of a non-backwards-compatible system. With higher capacity to deliver Ultra High-Definition services, robust reception on a wide range of devices, improved efficiency, IP transport, advanced emergency alerting, personalization features, and interactive capability, the ATSC 3.0 Standard provides much more capability than previous generations of terrestrial broadcasting.

The presentations highlighted the tremendous opportunities created for the broadcasting industry by ATSC 3.0. These opportunities are especially timely as the telecommunications and media industry moves towards the seamless integration of content creation, delivery, and consumption.

Additional notes are provided regarding the opening and keynote speaker sessions and sessions related to the satellite, travel, and cable industries.

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A. Opening Remarks by NAB President and CEO Gordon H. Smith

Wed. Oct 17, 2018

10:30 AM - 11:15 AM

Program Summary

The 2018 NAB Show New York opened with a welcome from National Association of Broadcasters President and CEO Gordon H. Smith. While consumers' ways of accessing content continues to evolve in a digital media landscape, Smith highlights how local radio and TV broadcasters' reliability as the most trusted source of information and dedication to innovating to better serve their communities remain constant.

Opening Speaker

Gordon H. Smith

President & CEO

National Association of Broadcasters

Opening Remarks

Gordon H. Smith

- Gordon H. Smith joined the National Association of Broadcasters as president and CEO in 2009. Prior to joining NAB, he served as a two-term U.S. senator from Oregon and late as senior advisor in the Washington offices of Covington & Burling, LLP.
- It's an honor to welcome everyone to the 2018 NAB Show New York at the Javits Center.
- This is a great time for the broadcasters
 - Broadcasters across the U.S. provided lifeline coverage before, during and after Hurricane Michael landed on October 10th
 - Broadcasters make sure that daily info is available on every handset
 - Speaking of our next generation TV, it will open a brand-new user engaging system and we look forward to it
 - In this year's event, there are about 300 exhibitors and 69 of them are first time exhibitors

B. Opening Keynote – Fireside Chat with Robert De Niro and Dade Hayes

Wed. Oct 17, 2018

10:30 - 11:15 AM

Program Summary

Actor, producer and director Robert De Niro headlined the Show Opening. In a Q&A with “Deadline Hollywood” Contributing Editor Dade Hayes, De Niro discussed the future of film and entertainment, drawing on his four-decades in the entertainment business.

Keynote Speaker

Robert De Niro

Moderator

Dade Hayes

Contributing Editor

Deadline Hollywood

Keynote Remarks

Robert De Niro

- My message today is – it’s time to make social responsibility in front of making a profit
- I admire the NAB for petitioning Congress to protect the rights of journalists. Today there are force weaponizing the First Amendment to give unlimited campaign financing to corporations, to protect false and misleading advertising, and to promote bad science for political ends.

Dade Hayes

- Tribeca, Tribeca Enterprises and Tribeca Film Festival is a cornerstone for you, how did you start it?

Robert De Niro

- After 9/11, we did the festival in 120 days and it felt right
- We called people we know and worked with, and they help a lot

Dade Hayes

- Production in NY is booming, and you’ve shot films all over. What comes out in the final product that is significant when you shoot her in New York?

Robert De Niro

- Shooting in NY is nice always because it’s home
- I have an idea about getting the Brooklyn Navy Yard to a cultural place and studios where people see how movies are being done
- We represent something in this world that other countries don’t; it’s time to get America on track again

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C. SATCON: How Satellites are Improving the Consumer Experience

Wed. Oct 17, 2018

11:30 AM - 12:00 PM

Program Summary

Satellite technology has introduced a long list of amazing new, and useful services to consumers from mobile telecommunications like directions and maps, to video conferencing, to drone streaming to the current weather and of course, home entertainment. This panel of industry executives explore the "wins and losses" of the profit-side of the most popular satellite-delivered consumer services. They'll also discuss what future business opportunities are awaiting consumers as well as those employed in the industry.

Produced in partnership with the Society of Satellite Professionals International (SSPI)

Moderator

Robert Bell

Executive Director

Society of Satellite Professionals, World Teleport Association

Panelists

Thomas Van den Driessche

Chief Commercial Officer

Newtec

Michele Scotto di Cesare

SVP, Commercial Business Development

Globecomm

Panelist Remarks

- Newtec Background
 - Newtec is a European company headquartered in Belgium
 - Newtec is specialized in designing, developing and manufacturing equipment and technologies for satellite communications
 - As a pioneer in the industry, Newtec is dedicated to creating new possibilities for the broadcast, consumer and enterprise VSAT, government and defense, cellular backhaul and mobility, offshore and maritime markets
- What do consumers know about satellites?
 - Consumers know that their GPS and HDTV has something to do with the satellites, for example satellites send television signals directly to homes; satellites are some of the best source of data for climate change research
 - What they don't know is satellites is key in the network even if you're not getting information directly from satellite. They are the backbone of cable and network TV

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- If someone is far away somewhere in the forest and he has signal in his cell phone, it's satellite that is providing the service, fiber is not able to do that
- Consumers pay for entertainment, like Netflix in the backseat of your car. Things in motion depends on satellite service
- What are your thoughts about autonomous cars?
 - Autonomous cars have to be at least connected cars
 - Without connected network, GPS or Netflix in the backseat won't work
 - Autonomous cars need satellite. Wireless companies cannot provide that kind of services
- Panasonic selects Newtec as technology partner for its advance global satellite network
 - Panasonic's new BC-03 modem, developed in conjunction with Newtec, will support speed of up to 250 Mbps to aircraft
 - broadband network with higher speed will be available on the plane, providing simultaneous data and video reception. Consumers will be able to watch Netflix on the plane
- C-Band will be freed up for terrestrial wireless use, what's your perspective?
 - C-band is currently used for satellite delivery of cable and broadcast network programming to TV and radio stations and cable head-ends
 - The FCC wants to open it up to wireless broadband to help close the digital divide and promote 5G
 - C-band won't completely go away
 - The satellite operators providing the majority of C-band satellite services to U.S. customers have banded together to create the C-band alliance, which will advocate for their proposal to clear portions of the band for 5G wireless while pledging to protect the broadcasters, cable operators and others who currently use the band

D. Empowering Technology

Wed. Oct 17, 2018

12:00 - 12:30 PM -

Program Summary

How are innovations being funded in today's fast-paced marketplace? Hear from these senior communications sector executives discuss what excites them enough to underwrite new ideas and innovative concepts. Where do they see the largest opportunities? What concerns them the most?

Moderator

J. Armand Musey

President

Summit Ridge Group, LLC

Panelists

John Hane

President

SpectrumCo.

Timothy K. Horan

Managing Director and Senior Analyst

Oppenheimer & Co. Inc.

Erik Ramberg

Head of TV Platform Product Management

MediaKind

Hossein ZiaShakeri

SVP Business Development & Alliances

Spectra Logic Robert Bell

Panelist Remarks

Timothy K. Horan

- People want to text rather than talk
- New applications changing the way people work

John Hane

- ATSC 3.0
 - Broadcasters will open for 3rd parties to use
 - Wholesale monetizing model for ATSC 3.0 as opposed to broadcasting directly

Erik Ramberg

- Not likely that wireless companies will initially seek to enter broadcasting industry to take over ATSC 3.0

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Hossein ZiaShakeri

- Intelligent smart storage will enable the large data transfer needed by emerging applications



E. The Power of Video in the \$1 Trillion Travel Industry

Wed. Oct 17, 2018

4:15 - 4:45 PM

Program Summary

The travel industry registered close to \$600 billion dollars in online bookings in 2017. Videos affected over 60% of those booking decisions. The travel industry is investing heavily in producing more video content globally. What is the opportunity for filmmakers, media service providers and manufacturers, travel brands, media companies and social influencers?

Moderator

Philip DeBevoise

Founder and CEO

Citizine Networks, Inc.

Panelists

Channon Hodge

Producer

CNN

Teri Johnson

Producer and Host

Travelista Teri

Panelist Remarks

Channon Hodge

- Background
 - Producer for CNN, serving as a videographer, editor and licensed drone pilot, creating video content for CNN and premium brands like CNN Travel and HLN

Teri Johnson

- Background
 - As a life-long traveler, I've visited 67 countries learning about the rich cultures of the world while working as a travel and lifestyle expert for various television and digital platforms
 - I also created a luxury home fragrance company inspired by my neighborhood of Harlem
 - I shoot "top 10 to do in the city" while travel, hoping it would be helpful for people who want to travel in a specific city
- How to connect with brand
 - Email them and introduce yourself
 - I once contacted Amex and landed product sponsorship to shoot top 10 things to do in Harlem
- How to get your pitch accepted
 - send one good video that you are satisfied

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- better not to send your website with 10 videos on it. If brand selects and watches one that's not very good, you lose your chance.
- Where do entrepreneurs like me make money from?
 - tourist board
 - brand

F. Fireside Chat with Christopher Ripley, President and CEO of Sinclair Broadcast Group

Thu., Oct. 18, 2018

11:30 AM - 12:00 PM

Program Summary

Sinclair Broadcast Group stands at the sharp point of the development and deployment of ATSC 3.0, the broadcast standard that is expected to fully revolutionize the broadcast television industry. From live mobile streaming at scale, and targeted ad-supported services, to delivery to home, mobile and automobile devices, Sinclair's large footprint is a force for change. As consumer behavior shifts from linear stationary consumption to on-demand mobile consumption, Sinclair's CEO indicated the Company is determined to help bring local broadcasting into the future.

In this conversation with Rick Howe, The iTV Doctor, Chris Ripley, President and CEO of Sinclair **Broadcast** Group, discussed plans to change how television products and services are created, distributed and monetized.

Keynote Speaker

Christopher Ripley

President & CEO

Sinclair Broadcast Group

Moderator

Rick Howe

The iTV Doctor

Speaker Remarks

- Background
 - 5 years at Sinclair
 - Prior investment banking experience
 - Self-described as reformed investment banker
 - Covered broadcast industry
- Sinclair's LT Growth Strategy
 - 3 Buckets
 - Content – most important
 - Winners combine information and content with convenience and user experience
 - Sinclair's ability to win comes from its strengths – local, topical, sports
 - Younger generation
 - Wants mobile but unhappy with choices
 - Their default is social media that does poor job and has trust issues
 - Wireless

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- Booster and tech. provider for ATSC 3.0
 - Will unlock value of spectrum now used by only 15-20% of population
 - Marketing Services/Advertiser Relationships
 - National market
 - Mobile focus
 - Capture share of wallet by offering integrated suite of services
- OTA
 - Quality
 - Antiquated
 - No incentive to sell
 - Linear model
 - No choice
- ATSC 3.0
 - 5 key broadcaster benefits
 - IP
 - TV no longer separate; becomes part of an integrated/hybrid environment
 - Merge sources of Information and data merger
 - OTA or internet
 - Seamless interface
 - Increased capacity
 - A mobile-first standard
 - TV of future is a personal device
 - Content consumed on personal devices
 - Targeted ads
 - Paywall
 - Offer subscription services
- Technology
 - Make it available/compatible for ATSC 3.0
 - ATSC 3.0 compatible receivers
 - Coordinate with carriers
 - No takers but confident they will cooperate
 - Public safety applications
- Content Developments
 - NewsOn
 - Stir
 - OTT
 - Ad-supported streaming service
 - AVOD – Advertising Video on Demand
 - Linear and on-demand content
 - Local and national news
 - Syndicated entertainment content
 - Operated out of Los Angeles and Seattle
 - Operational assistance from the Tennis Channel

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- Marketing push
 - Full suite of channels and on-demand assets
 - Not just news and syndicated content
- ½ of business is selling content to other distributors, e.g., Comcast
- Tennis Channel
- Stadium
 - 24/7 plus on-demand
- Local Sports
- Content Trends
 - Technology companies turning content into a negative margin business
 - Negative gross margin
 - Spending dollars on content
 - Sinclair's content has unique value
 - Local
 - Sports
 - Topical
 - Example is Tennis
 - #1 brand
 - #1 cable channel
 - #1 online destination
 - #1 magazine
 - Branching out
 - Betting
 - Tennis is #2 betting sport in the world
 - In-match betting
 - Bet in real time
- M&A Activity
 - Sinclair
 - Deregulation proponent
 - Focused on consolidation
 - Looking for distribution; increased footprint
 - Not solely a broadcasting company
 - Better described as a media or technology company
 - Broadcasting
 - Too small as an industry
 - Traditional broadcasting industry coming to an end
 - Issue/question is not who will dominate broadcast space
 - Relevant field is much broader
 - Broadcasting will mesh with media and technology companies
 - Competition
 - Not just broadcasting
 - Media companies
 - Deep-pocketed tech giants like Netflix and Google
 - Consolidation
 - Must be part of the mix
 - Sinclair focus

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- Consolidation within television
 - Adjacent markets like cable
 - RSN
 - Digital
- Disney/21st Century Fox
 - Disney required divestiture of assets acquired
 - Sinclair considering a bid for the regional sports networks
- Acquiring a cable operator (i.e., MVPD)
 - No deal currently on the table
 - Never say no to anything
 - Will buy literally anything for the right price
- Sinclair strategy/mindset
 - Sinclair different from average broadcasting
 - Broadcast strategy within a media company
 - Sinclair also a technology company with a technology mindset
 - Peers approach from a content or sales strategy
- ATSC 3.0
 - Wireless pipe
 - More efficient than 4G or 5G
 - Arcane regulations limiting ability to span U.S.
 - Spectrum co. is workaround
 - Partnership with other broadcasters
 - Partners contribute spectrum to cover entire nation
 - Spectrum efficiency
 - Could potentially could allow for more channels
 - More likely that spectrum will be used for datacasting, audio, and automotive-related content and entertainment
 - Highest and best use of ATSC 3.0 may not be mobile video



G. ATSC 3.0 Update - What, Where and Especially WHEN?

Thu., Oct. 18, 2018

12:00 - 12:45 pm

Program Summary

Steve Jobs built a career, a company and an industry by creating consumer products that we didn't know we wanted, and then couldn't live without. ATSC 3.0 has the same potential, if it is built right and deployed broadly and quickly. This panel discussed what needs to be done to get ATSC 3.0 designed and deployed, where that is all going to happen first, and when broadcasters and content owners can expect to sign up their first ATSC 3.0 customers.

The consumers can wait. Can the industry?

Moderator

Rick Howe
The iTV Doctor

Panelists

Louis Libin
Managing Director
HC2 Broadcasting

Jason Patton
SVP Sales & Marketing
Verance

Marci Ryvicker
Managing Director
Wolfe Research

Anne Schelle
Managing Director
Pearl TV

Panelist Remarks

Marci Ryvicker

- ATSC 3.0
 - Not part of the Wall St. conversation
 - Few years away
 - Can't quantify
 - Empty spreadsheet cells

Anne Schelle

- Consumers are key stakeholders for ATSC 3.0

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- Young people personalize their viewing
 - Use small devices
- High interest
 - Question re: delivery/distribution
- Key factors/requirements = Ease of use and free
- Many young people do not know about OTA distribution (i.e., broadcast TV)
- Young people want ease of use
 - “Shit, that was easy”

Louis Libin

- Low power = community broadcasting
- Decide/accept/realize/recognize attachment/relationship to the phone

Anne Schelle

- ATSC 3.0 in development stage
 - Operating under experimental authority from FCC
 - Tremendously powerful
 - TV service
 - Do more with available spectrum
 - Standard just completed (Jan. 2018)
 - Mobile built into the standard
- Pearl part of announcement with Fox and NBC
- Needs to be simple/ease of use plus high quality

Jason Patton

- All need to think about consumers
 - Using OTT
 - Get early-adopting consumers
- Interactivity & personalization

Anne Schelle

- ATSC 3.0 is a flexible platform
- 2020 target

Marci Ryvicker

- Can TV wait until launch of ATSC 3.0?
 - People waiting to see what happens to TV industry by ATSC 3.0
 - Don't want to wait but must be right
 - Patience vs. quality
 - Must have content
- Can the industry roll out ATSC 3.0 services and content fast enough to keep up with competing technologies?

Louis Libin

- ATSC 3.0
 - Big pipe with killer distribution
 - Not a TV service but instead a wireless service
 - Creating connections in a way never done before
 - Greenfield opportunity
- HC2
 - 1st priority is accumulating stations and tying them together

Jason Patton

- Lot of capabilities from ATSC 3.0

Marci Ryvicker

- Lot of U.S. covered by 2021, but 2021 is far for Wall St.
- Needs investors from outside traditional broadcasting sector
 - Cloud investors
 - Wireless investors
- Need a long-term investor outlook

Anne Schelle

- Agree that investors will look at economies of spectrum use
- For certain use cases, ATSC 3.0 has advantage over 5G because of the economies of spectrum use
- Pearl can play when tremendous amounts of data need to be moved
- Wireless carriers not using all the spectrum they have available
- 2020 launch of commercial TVs for sale

Louis Libin

- ATSC 3.0
 - Convergence technology
 - Tying together different aspects of media

Anne Schelle

- Survey by Pearl
 - Respondents prefer set-top boxes be built into TVs

Marci Ryvicker

- Young people not aware/comfortable with broadcast and cable

Anne Schelle

- ATSC 3.0 starting point
 - Converting sports enthusiasts
- ATSC 3.0 Need
 - Global chipsets

Louis Libin

- Best marketing is to build the best system
- Best feature of ATSC 3.0 is its robustness

Jason Patton

- ATSC 3.0 taking off overseas
 - Proven and working

H. Accelerating on the Road to ATSC 3.0

Thu., Oct. 18, 2018

3:00 - 3:45 pm

Program Summary

Deployment of ATSC 3.0 is moving to the fast lane, now that stations in Phoenix, Dallas, and East Lansing are signing on with collaborative projects. From the single frequency network system in Dallas to the technical testing in the Phoenix Model Market and the first public TV broadcaster in Michigan, broadcasters are learning the capabilities of the next-generation TV standard. In this rapid-fire discussion, you'll hear how the road to ATSC 3.0 is being driven with flexibility, collaboration, and excitement.

Moderator

Dave Arland

Arland Communications

Panelists

Mark Aitken

VP, Advance Technology

Sinclair Broadcast Group, Inc

Prabu David

Dean, College of Communication Arts and Sciences

Michigan State University

Sandhi Kozsuch

Principal, Strategic and Industry Initiatives

Cox Media Group & Pearl TV Business Alliance

Panelist Remarks

Sandhi Kozsuch

- Pearl
 - Consortium of major media cos.
 - Mobile TV (ATSC 1.0) start
 - 5-6 years on 3.0 ATSC
 - Prepared petition passed by FCC
- Testing ATSC 3.0 in Phoenix
 - April 2018
 - Consumers and technology
 - 12-16 months
- Consortium
 - Announced collective effort to roll-out 3.0
 - Includes NBC, Fox, Telemundo, Univision

Mark Aitken

- Announced commitment for 26 stations/markets by end of 2019

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- Sample chips off production line
 - Mobile ATSC 3.0 chipset
- Bring together product side and receiving solutions
 - Reach consumers on mobile platform

Sandhi Kozsuch

- Product side endorsed Pearl's plan

Prabu David

- ATSC 3.0 experimental license
 - Granted by FCC
 - Now broadcasting
 - East Lansing
- Public media
 - Access but missing some content

Mark Aitken

- Single Frequency Network ("SFN")
 - Baltimore, MD
 - 1st SFN
 - Dallas
 - Really about the ecosystem and working with other players
 - Technology easy
 - Business relationships/partnerships key
- ATSC 3.0 turns OTA into new OTT provider
- Companion devices
- Scalable video
- Transition requires station shut-downs
 - Question is how to do this and minimize cost
- Sinclair added an AVC
 - Stadium
 - Unannounced/unadvertised
 - Lot of unsolicited appreciation received

Sandhi Kozsuch

- Lighthouse ATSC 3.0 transition
 - 1st ATSC 3.0 station in Phoenix, AZ
 - KFPH-CD Channel 35
 - April 2018
 - Station needed to sign-off as 1.0 and sign-on as 3.0
 - Testing of ATSC 3.0
 - Study the transition
 - Logistics challenge
- 2nd station in late 2018/early 2019
- Avis collaboration

- One of many potential business models
- Other opportunities
 - Mobile
 - Automotive
 - Test opportunities with auto
 - Backseat entertainment
 - Front seat data
 - Semi-autonomous car
- Broadcasters in position to provide services to automotive

Prabu David

- E. Lansing is 1st public station

Mark Aitken

- Standard setting
 - 3.0 not set in concrete
 - How flexible?
 - Important that it is not set in concrete
 - Ability to add thousands of modifications
- Wireless
 - Lot of wireless does not understand broadcasting
 - Wireless has issues regarding amount/availability of spectrum to carry expected levels of data
- ATSC 3.0
 - Not just television; has broader applications/uses
- EAS Test
 - Emergency alert system
 - Test recently went to cell phones for 1st time
 - Bootstrap
 - Lowest level of signaling

Prabu David

- Lab work
 - How staffed?
- Anecdotal example of not knowing about free TV (i.e., OTA)

Mark Aitken

- Need ease of use to compete with mobile/internet
- Single Frequency Network
- People consume content with all types of devices
 - Broadcasters need to consider all devices
- Need to get device community to participate/endorse 3.0 by adding necessary chipsets

Sandhi Kozsuch

- Learning a lot from Korea
 - OTA increasing from 8% to 20%
- Broadcasters have OTT and MVPD (multichannel video programming distributor) partners
- Transition to ATSC 3.0 will become easier as they learn more about the transition process

Mark Aitken

- Sports and live events network on board with regarding to Next Gen TV (aka, ATSC 3.0)
 - Delivery of the associated amounts of data won't happen with the internet
- Chip designed for mobile
 - Key piece is embedded automotive functionality, i.e., 4 antennas

Prabu David

- ATSC 3.0 great opportunity for large amounts of data
- Broadcast is great data transmission pipeline
- UHD TV can't work in last mile broadcasting
 - ATSC 3.0 is over-the-top to OTT

Sandhi Kozsuch

- Survey results re: Next Gen TV (aka, ATSC 3.0)
 - Most recent of several surveys
- Better picture and sound followed by enhanced audio, i.e., multiple audio channel options

I. Globecast Americas: Content Monetizing: An Ongoing Challenge

Thu., Oct. 18, 2018

4 – 5:00 PM

Program Summary

Content monetization: two easy words to write, but an ongoing challenge for content creators and rights holders globally. This presentation will look at the changing role of a media services provider and how the demands of an anytime, anywhere market can be fulfilled.

Presenter

Tim Jackson

SVP, Sales and Marketing, The Americas
Globecast

Presenter Remarks

- Globecast Digital Media Hub
 - Short-form focus
 - Live streaming
 - Live spotter
 - Clips and posts content
 - Pop-up channels
 - Content marketplace
- Live spotter
 - Control use of content
- Content marketplace
 - Tag, monetize and exchange content
 - Content bazaar
- Broadcast partners
 - Global knowledge
 - Flexibility
 - Simplicity
- Globecast
 - Part of Orange Group
 - Facilitator and service operator
 - Will not yet get involved in pricing
- Orange Group
 - Huge player in mobility
 - Multi-faceted organization

J. Conversation with Triveni Digital about ATSC 3.0

Mark Simpson

Founding President and CEO of Triveni Digital (<http://www.trivenidigital.com/index.php>)

Company Overview: Triveni creates innovative solutions for broadcast, cable, telco, and IPTV Networks

Richard Chernock

Previous Chief Science Officer Triveni Digital

Previous Chairman of the ATSC Technology Group on ATSC 3.0

Q: How do you see ATSC 3.0 and 5G interacting with one another?

Mark

One of the things that is true about spectrum is some content is broadly interesting; most people should view the content and you are sending that in a one to one manner, basically any time anyone gets their own individual content they get it on their own individual stream. That's insane, that's highly inefficient. At the same time, the ability to one to one send things and so on is important.

It is really a blend of these two technologies (ATSC 3.0 and 5G) that's most powerful. I feel like the exploitation of broadcast distribution technology and techniques for content of mass appeal is underexploited. With the combination of sort of 5G and broadcast techniques you sort of get the best of both worlds. Of course, you need to build robust systems and things like that. I don't think 5G will suffice in a world where you have ATSC 3.0 as an available part of the content delivery system.

Q: How do you see ATSC 3.0 and 5G interacting with one another?

Richard

The thing about 5G is it is still in the early stages of the hype cycle, so it can do all kinds of things. It can't do all of those things at once and not all combinations are physically possible or make economic sense. There will be a process of winnowing down, it has already started, to figure out what 5G is actually good at and what people can actually build and make money.

Right now, there is this thought that 5G will give you this enormous bandwidth everywhere, low latency, etc....and it will if you put a repeater every 100 meters or so. It is a feasible option in localized areas, for example if you plan on covering a factory then its good but for New York City it is not. It just cost way too much and that's not a use case people are willing to pay for because when you deploy something like that with a cost associated with it, then you have to charge accordingly.

5G does have broadcast modes but until you get to a large tower, the economies of scale aren't there. I think 5G will succeed, there will be many good use cases, and it's going to be great for individualized stuff. It not going to be really good for mass imagery. You will not see the super bowl over 5G, you will see the Super Bowl over broadcast television because it scales appropriately.

Q: Do you think that your cellular device (handset) will turn into the next modem or miniature cell site in your home and replace cable?

Richard

The economics don't work out. In an ideal world, stuff that goes out to lots of people goes out over broadcast over the big tower distribution. Stuff that goes one to one goes over the cell network and broadcasters and cell providers work together to provide the best most economical service. That's the end of the world (Rich jokes).

You look at business pressures and the consult guys want to get rid of the broadcasters, so they can offer you television and charge you overage, which is where they make all of their money. Cooperating with broadcasters doesn't give them the opportunity. The user will say I am not going to pay a cell provider to watch television because that would be too costly.

Mark

There are plays out there that are close to being funded that essentially assume both 5G and broadcast ATSC 3.0 as kind of the platform to do it on. Interesting services are planning to build on top of it. That blending has a sweet spot of some sort of offering. Broadcast techniques have tremendous power and efficiency. ATSC 3.0 makes it so that reception is actually reasonable. ATSC 1.0 had a lot of early reception issues. ATSC 3.0 is much more tuneful and customizable. Thus, the ability to get the bits to people is much better with ATSC 3.0 than ATSC 1.0.

The secret of ATSC 1.0 is not that many people had an antenna to receive the transmission. It was received mostly through cable and of course the broadcasters got addicted to the re-transmitting fees. They do not have much of an incentive to get the reception going.

With ATSC 3.0, since they will be putting services on top of it the incentive is coming back. Over time I think we will see a major buildout of broadcast towers and fill-ins from the market to receive this kind of content info. It's going to be an interesting next 20 years.

Q: How do you see satellites playing into this? How will GEO's and LEO's be utilized?

Richard

The cost of getting equipment in place is very high, the cost of fixing this equipment is very high and you can't increase the capacity once you put a satellite up there. They have their uses, but you have to look at it in terms of, what can they do well, what can't they do well, what are the costs, and how do they fit into everything else.

One example with the handsets is manufacturers put extra functions into the handsets because if the provider doesn't want them to get turned on they won't get turned on. The FM chip is an example. Cells phones had FM chips for a long time and Verizon and AT&T said we don't want those, so they sat there dead in the phone. There is a cost to putting it in but there is no benefit. If you put a an ATSC 3.0 tuner in a cell phone, which you can do, it's the same thing. Cell providers don't want the tuner because it threatens their business model, so they won't allow it to be turned on.

Q: How does the ATSC 3.0 tuner threaten the cell provider's business model?

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Richard

They want you to use the cell network to get video content and then charge you when you go over your limit. The thing that may offset that is emergency alerting.

Cell providers need to support the WEA system, the text messages to phones, but they are being pushed because 90 characters isn't enough, and the system is too limited. They are being asked to have bigger messages, include rich media, include links to other things and so on. They don't want to do it. It's is very expensive to build their system.

Television broadcast is very good for emergency alerting and you can send messages, you can send maps, you can send videos. Some people are working on the angle, the possibility, that the network provider will allow ATSC tuner chips in the phones. The emergency alert can be done over the television broadcast and they can be relieved of supporting all of this news stuff. Which would then make their lives much easier, so there is a possible angle there.

The thing is, most of the time when you have an emergency of some sort broadcasting keeps on going, but the cell system and cable system is gone. Cell towers go down and the batteries run out of juice. They build TV and radio stations hardened with the antennas which are able to withstand the storms. Additionally, they have generators and extra fuel. If a hurricane comes through, the TV stations are still broadcasting. The cell system is shot.

Q: Where do you see ATSC 3.0 taking us?

Richard

I think it's actually going to do well. One of the other things is that most people don't know or don't care how their content got to them. They're like I want this, or I want to watch this.

A lot of the content production and creation takes place in the broadcast world. Local news is one thing that's kind of waned and come back. A lot of people turn to the local television station for local news. Local news is still there, and no one is picking it up. That is one strength the broadcast stations have and will continue to have is information in the community. It is hard to put numbers on there, but it gets people to tune in and watch.

Q: When do you see ATSC 3.0 being largely implemented?

Richard

I think probably 3.0 we will see a lot growth in 2019 through 2020. Though maybe not in the phones yet but in TV's and Gateways.

There are new devices that will be showing up soon. Which sit in the house and include a tuner, antenna, WIFI and tune ATSC 3.0 and any device in your home that can-do video becomes the television. So, you can take your cell phone, tell it to tune ABC and I can watch broadcast television on my phone, tablet or smart TV if it is WIFI connected. Those that are coming along are going to be fairly inexpensive. I think that's going to be the big thing early on.