



Advances in Delivery - TV

April 12, 2015

NAB Show 2015

Featuring
GatesAir's



Joe Seccia
Chief Product Officer

Advances in Delivery - TV

Joe Seccia

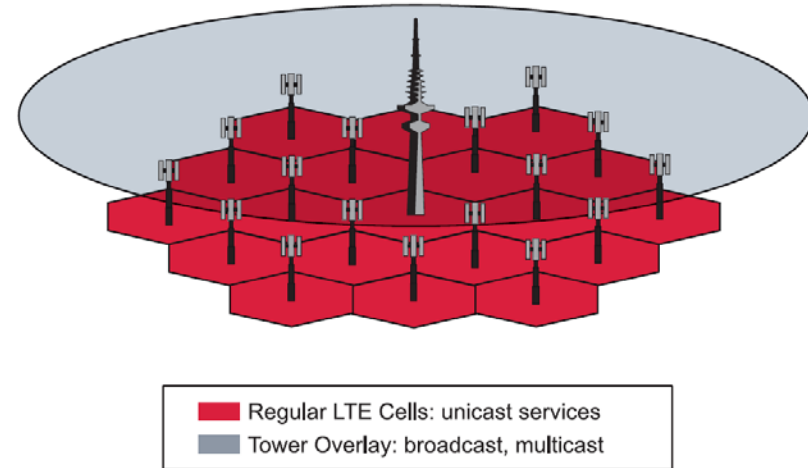


LTE Mobile Offload



What is LMO?

- Technology envisioned / created by the Technical University of Braunschweig. Known to industry as “Tower Overlay”.
- GatesAir partnering with TUB to commercialize.
- The basic idea is to offload popular services, especially live video, from cellular networks
- It is realized using High Tower, High Power (HTHP) transmitters so that...
- HTHP transmitter coverage “over – lays” the many cellular towers
- HTHP transmitters are typically operated by network operators or broadcasters.
 - There are cases where the broadcast network operators and the mobile network operators may have common ownership or an existing business relationship.

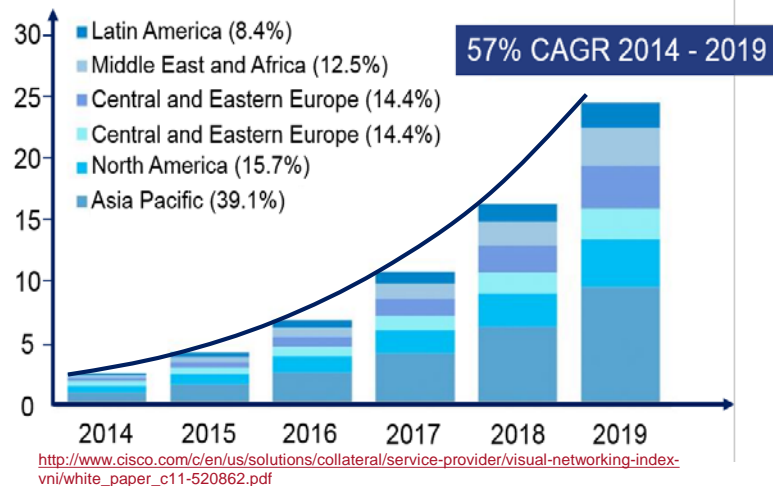


Why is LMO Useful? (1)

Cisco Global Mobile Data Forecast 2014-2019

Exabytes¹
Per Month

¹ 1 EB = 10¹⁸ bytes
= 1,000,000,000,000,000,000 bytes



- Mobile phone bandwidth:
 - Ericsson and Cisco predict exponential growth of bandwidth needed - driven largely by video consumption
- Placing popular content on an HTHP network would reduce LTE network load
- LMO maximizes the use of existing spectrum and revenue opportunities for both broadcasters (network operators) and telecom operators



Why is LMO Useful? (2)

“Insatiable demand for bandwidth fuels mobile network capacity issues... despite efficiency improvements”

Alan Solheim, DragonWave | Mobile Dev Design

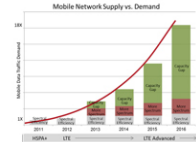
Feb 4, 2013

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Alan Solheim, vice president of corporate development at DragonWave, holds a PhD in electrical engineering from the University of Waterloo. With more than 25 years of industry experience in telecommunications, he heads up business development and strategic marketing for DragonWave with a strong emphasis upon the development of overall value proposition for its different customers and partners. Previously, he was VP of product management, where he was responsible for the introduction of DragonWave's award winning Horizon packet microwave product line.

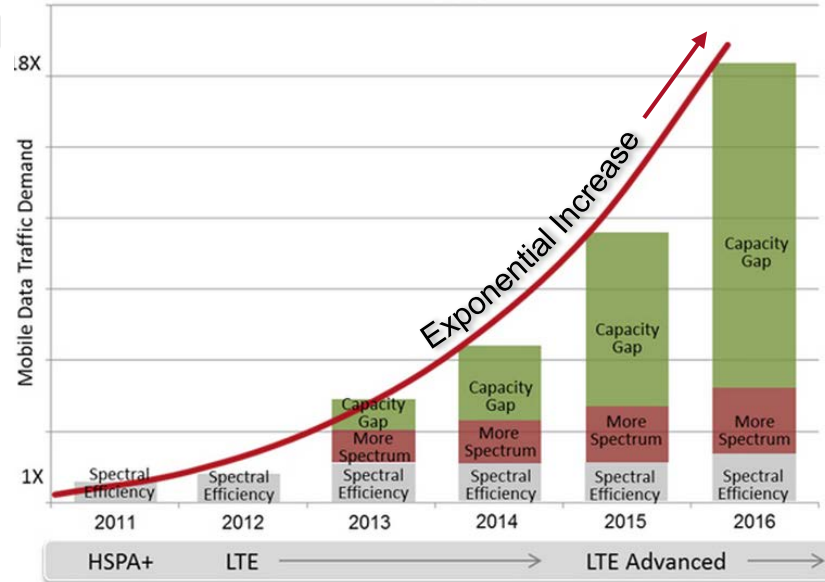
Smart phones and tablets are driving the insatiable demand for bandwidth in mobile networks. End users expect content-rich applications such as Web browsing, gaming, video streaming, and interactive maps to be available on any wireless device, transforming and often overwhelming today's mobile networks.



The mobile network capacity gap keeps increasing despite the adoption of LTE with more bandwidth and improved spectral efficiency.

Much of the industry's focus has been on radio access technology, with the expectation that the evolution from 3G to HSPA+ to LTE will satisfy the demand. But advances in spectral efficiency, coupled with aggressive liberalization of new spectrum for mobile applications, still fall short of meeting capacity demands (Fig. 1).

Mobile Network Supply vs. Demand



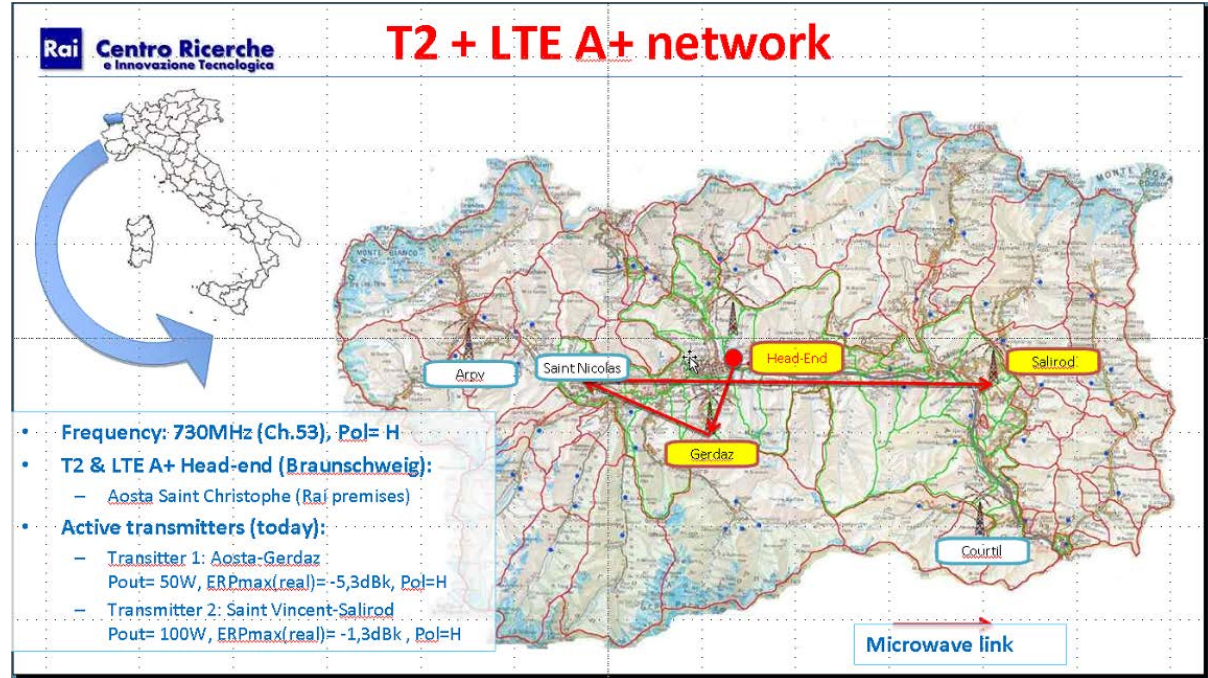
LMO Industry Activities

- Field trial led by TDF, Paris, France will wrap up soon.
- GatesAir UAX500 transmitter used at Eiffel Tower.
- TU-BS gear for LTE-A+ generation and reception.
- 738 MHz (Ch. 54)
- TDF prepared a standard DVB-T2 multiplex offering as well as specific content targeted to the mobile device via the LTE-A+ carrier to simulate press, catch-up TV/Radio, VoD, news as well as linear offering.



LMO Industry Activities

- RAI also conducting a field trial
- Aosta valley, Northern Italy
- 730 MHz, Ch. 53

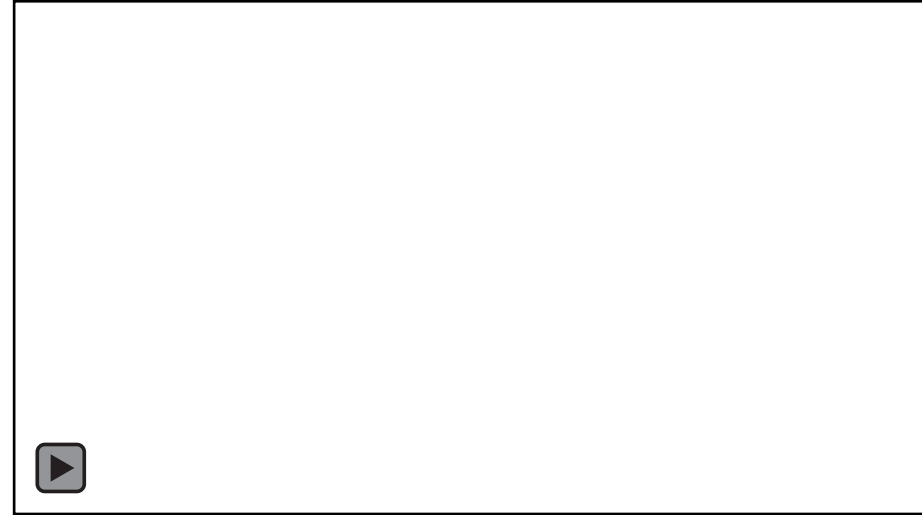
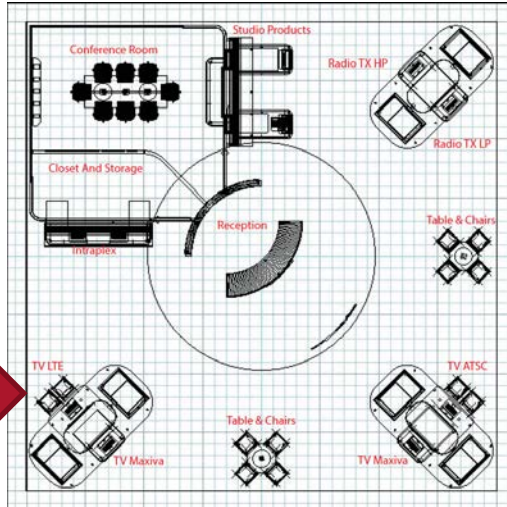


- May 27-29: iTVF, Istanbul
 - LMO paper to be presented
- Early June: A workshop is being planned by the trial partners for interested parties in broadcast network operator space and the mobile network operator space to reflect on the trial results and to plan the industry way forward to commercial realization.



LMO Booth Demo

- We will demo the technology again this year.
- GatesAir equipment will be in the air-chain.



ATSC 3.0



- ATSC on track for candidate standard documentation by the end of this year.
- Many of the physical layer decisions have been analyzed and tentatively decided.
 - Constellations
 - Forward Error Corrections
 - Waveform structure elements
 -
- Issues such as IP delivery method / technologies have also been vetted.
 - DASH, etc.
- Less contentious items such as video codec will be added.
- Still no official tie between ATSC 3.0 and FCC Auction.



Field Testing

- We have spearheaded a field test site with help from Tribune and Pearl.
 - WJW, Cleveland. Ch. 31, 600 kW ERP
 - A 3-tube IOT transmitter, dormant since 2009 shut-off is being powered up.
- Experimental license granted to GatesAir for 6 months.
- Initial tests to be GatesAir / LG / Zenith system.
- Plan to turn over to NAB laboratories to be used as an industry-wide test bed for other interested parties.



ATSC 3.0 Booth presence

FUTURECAST™

- Large demo area to showcase both UHD and mobile HD capabilities of Futurecast.
- LG hosting press event in booth early Monday morning.



Targeted Advertising Demo

Press Release



Visit Triveni Digital at the 2015 NAB Show, Booth SU8802

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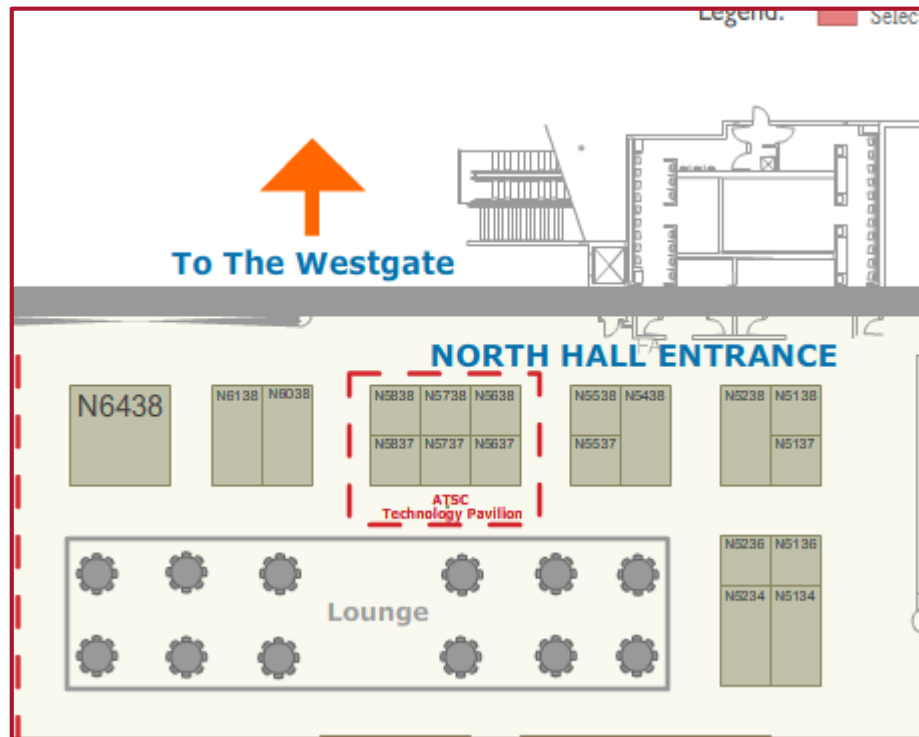
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For Immediate Release

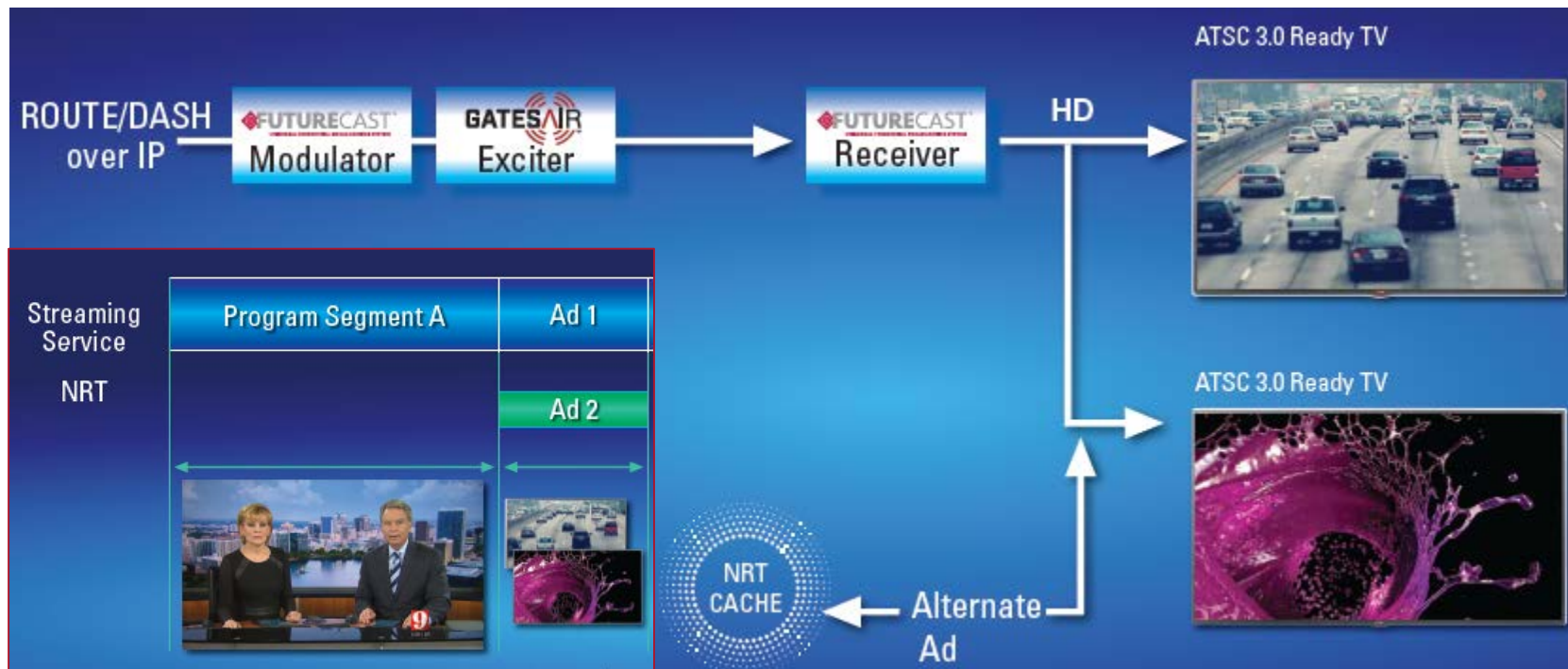
Triveni Digital Demonstrates Targeted Ad System For ATSC 3.0 at 2015 NAB Show

*Together with GatesAir, LG and Zenith, Triveni Digital Shows
How Broadcasters Can Leverage Next-Generation Television Standard*

PRINCETON, N.J. — April XX, 2015 — Triveni Digital will demonstrate a unique new targeted advertising application for the ATSC 3.0 next-generation broadcast television standard at the 2015 NAB Show, April 13-16. The milestone demonstration, which includes technologies from LG Electronics, Zenith and GatesAir, will be featured at the ATSC Technology Pavilion, booth N5637, Las Vegas Convention Center



Targeted Advertising Demo



Enjoy the Show!

