

LTE-Broadcast: Backgrounder (May 2014)

Introduction

In the collision between traditional broadcast operators and *mobile network operators (MNOs)* one technology is positioned for high growth over the next few years. LTE-Broadcast technology has the potential to enable new services to wireless customers at low cost. It will drive a new wave of opportunity for MNOs, content providers, and consumers alike. This background paper highlights the opportunities ahead.

Overview

LTE-Broadcast is a network technology that efficiently delivers the same content simultaneously to multiple customers within a serving area. High quality broadcast services or multicast services, including video, audio, and software updates, can be delivered to users of smartphones, tablets, and other mobile or LTE-connected devices.

LTE-Broadcast offers new, innovative, and more cost effective solutions and improved services to MNOs. For example, operators could:

- Deliver rich media services, including instant replays, audio commentary, and close up video in a stadium or sports event context.
- Broadcast “top channels” over LTE in high-density areas, such as a downtown core, shopping centers, or apartment complexes.
- Deliver “top 10 videos” from the most popular social media sharing sites.
- Deliver software or database updates en mass to smartphones, tablets, or other machines in the *Internet of Everything*, such as automobiles, vending machines, or parking meters.

From a standards perspective, LTE-Broadcast specifically refers to the 3GPP Release 9 standard known as *Evolved Multimedia Broadcast and Multicast Service*, or eMBMS. MNOs can either broadcast or multicast content. The same content can be broadcast to all users in a cell, or even multiple cells, using a *Multicast Broadcast Single Frequency Network (MBSFN)*.

The Spectrum Bandwidth Challenge

In existing 3G and 3G LTE networks, all mobile Internet traffic is “unicast.” There are individual streams of traffic between the content providers on the Internet and the mobile subscriber. Even in newly deployed LTE networks, high bandwidth video services are rapidly consuming the available spectrum. As a result, just 10% of subscribers using video will consume 50% of the available spectrum bandwidth. In the future, video streaming is expected to explode with connected cars, connected TVs, and new services (e.g., Amazon Fire and Aerio). As this trend continues, MNOs will experience increased capital and

operational costs. LTE-Broadcast is a cost effective and efficient solution in many scenarios across a typical MNO network.

The Business Case for LTE-Broadcast

While it does not directly replace unicast delivery of Internet content, LTE-Broadcast offers opportunities for new services and innovative business models. ITK Vector Inc. has developed a business case that outlines the potential benefits of LTE-Broadcast technology.

An MNO who deploys the LTE-Broadcast technology with its existing mobile TV services (including standard channel programming, as well as live sporting events) could show a return on investment within two years or less, and potentially reach a cost break-even point with a relatively small number of subscribers.

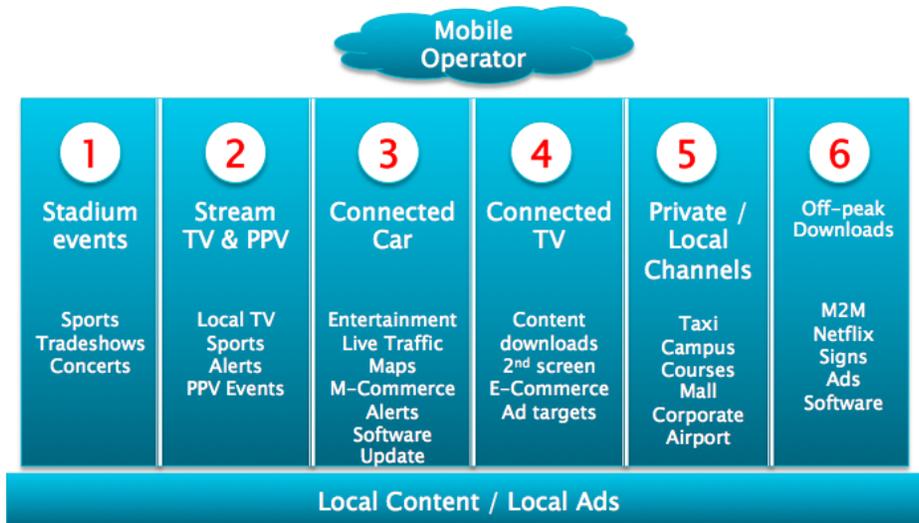
As expected, our investigation revealed significant savings in the *radio access network (RAN)* through the use of LTE-Broadcast’s common channels to multicast or broadcast content to subscribers.

An additional benefit was seen on the backhaul network that connects the core of the network to the edge. Increased backhaul network efficiency can remove bottlenecks and significantly reduce overall cost of operation in a large network.

Our business case has revealed significant operational cost reduction, and capital and operational cost avoidance with LTE-Broadcast. Even more exciting, however, are the revenue opportunities that can be realized with this technology.

Opportunities

There are numerous incremental revenue opportunities for the MNO to add value to services, as shown in the following figure:



Specific examples of LTE-Broadcast or *LTE-Multicast* include:

- Live streaming of content (e.g., audio, books, PPV events, or second screens to support live TV).
- Live streaming in specific locations (e.g., airports, taxicabs, bars, shopping malls, university campuses, or military bases).
- Live streaming of private events (e.g., product launches, town hall meetings, analyst events, or online courses).
- Delivery of previously recorded content (e.g., audio or video) and app upgrades.
- Unicast delivery of surveys, ecommerce, and other engagement activity to support the broadcast use cases above.
- Live advertising networks (e.g., video ads on busses, bus shelters, or billboards).
- Secure connected car communications (e.g., M2M, content, or personalized maps and schedules).

Revenue Growth Potential

LTE-Broadcast offers revenue acceleration models which differ from traditional price-per-minute or price-per-megabit offers. In the traditional model, revenue is effectively limited by the available spectrum at peak times and in prime locations. Network congestion can be relieved temporarily with increased capital spend (e.g., add cell sites) and increased operational expense (e.g., add backhaul links). But the insatiable demand for video, particularly during significant sporting events, cannot be met with unicast technology.

LTE-Broadcast, multicast, and even hybrid *unicast-multicast* models effectively break through the spectrum barrier. If ten people, 100 people, or even 1,000 people all wish to join in and watch the same event, LTE-Broadcast can deliver a high quality service to everyone, providing a revenue stream that is not limited by the available spectrum. The potential for revenue opportunities at large venues for sports or other events are significant.

Furthermore, our studies have shown that the breakeven point for multicast over unicast can often be achieved by a very small number of users watching similar content in a single serving cell area. As the demand for HD content increases and the video capability of our handheld and tablet devices improves, the breakeven point will continue to drop.

Looking Ahead: LTE-Broadcast in 2014 and 2015

1. LTE-Broadcast will move from a little known technology in the beginning of 2014 to a field-trialed and verified solution that many carriers will actively deploy in their networks by early 2015
2. Our ongoing investigation of handset deployment with LTE-Broadcast indicates that the first handsets will be available by the second half of 2014.

3. Verizon, Telstra, and other global carriers continue to announce LTE-Broadcast trials or launches. AT&T has publicly disclosed plans to deploy LTE-Broadcast.
4. Those MNOs who offer mobile TV services and who are not launching, or at least preparing for, an LTE-Broadcast implementation risk being left behind from a cost competitiveness perspective.

Conclusion

There are an increasing number of opportunities for mobile network operators and others in the LTE realm. As subscriber expectations for their mobile content evolves, and as costs associated with operating and maintaining networks increase, LTE-Broadcast technology offers MNOs the means to offer new and innovative services that can reduce their costs while increasing their revenues significantly.

ITK Vector Inc. has the tools and the expertise to develop a business case for LTE-broadcast for your specific context and needs. If you are planning to deploy LTE-Broadcast, or are simply interested in learning more about it, contact ITK Vector Inc. to learn more about how we can develop an LTE-Broadcast business case for you.

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Terms

Evolved Multimedia Broadcast and Multicast Service, eMBMS: The formal name for a point to multipoint interface specification that can be used for video and audio broadcast or multicast over an LTE wireless network.

Internet of Everything or Internet of Things: These terms are used to describe the future environment where billions of devices ranging from light bulbs and switches to advertising signs are all connected to the Internet using a range of protocols and low power radio devices.

LTE-Broadcast: The technology of eMBMS being used in the context of an LTE 4G wireless network to make video and/or audio content available to all of the devices and customers in a cell site or serving area.

LTE-Multicast: This technology is similar to LTE-Broadcast except that the content can only be received by a limited number of devices and customers in a cell site or serving area, based on their subscription profile or authorization to view the selected content.

Mobile network operators, MNOs: Companies who own licensed radio frequency spectrum and have built a mobile network to provide a range of services to their customers.

Multicast Broadcast Single Frequency Network, MBSFN: As part of eMBMS, certain LTE channels, as part of a single frequency network, will be used to provide multicast and broadcast services. Adjacent cell sites will transmit the same broadcast or multicast content on the same single frequency.

Radio access network, RAN: The wireless network that is operated by a mobile network operator. It is the part of the network that connects mobile devices (e.g., smartphones, tablets, or other devices) to the cell site or tower. The RAN uses the licensed radio frequency spectrum that is allocated to the mobile network operator.

Unicast: “Point to point” transmission of information from a content provider (e.g., on the Internet) and a consumer of the content using a device, such as a smartphone. Unicast is the traditional method used within mobile networks, and is inefficient for when the same content is being requested by many users within the same network.

Unicast-multicast: A hybrid model whereby a consumer and network may dynamically shift from a unicast connection to a multicast connection if several consumers are viewing the same content.

Sources

Blair, Michael (November 21, 2013). "Qualcomm analyst day has messages for all players in smart connected devices". *Seeking Alpha* [blog]. Retrieved from: http://seekingalpha.com/article/1854471-qualcomm-analyst-day-has-messages-for-all-players-in-smart-connected-devices?source=iphoneportfolioapp_email

Ericsson (February, 2013). *LTE Broadcast: A revenue enabler in the mobile media era* [white paper]. Retrieved from: <http://www.ericsson.com/res/docs/whitepapers/wp-lte-broadcast.pdf>

Fitchard, Kevin (April 9, 2013). "Why Qualcomm thinks LTE-Broadcast will work where FLO TV failed". *Gigaom* [blog]. Retrieved from: <http://gigaom.com/2013/04/09/why-qualcomm-thinks-lte-broadcast-will-work-where-flo-tv-failed/>

Morris, Anne (October 30, 2013). "LTE Broadcast still far off in Europe, but coming into focus". *FierceWireless: Europe* [blog]. Retrieved from: <http://www.fiercewireless.com/europe/special-reports/lte-broadcast-still-far-europe-coming-focus>

Santo, Brian (April 4, 2013). "Telenor Sweden readies for multi-screen". *CED* [blog]. Retrieved from: <http://www.cedmagazine.com/news/2013/04/telenor-sweden-readies-for-multi-screen>

Seneviratne, Channa (October 28, 2013). "Telstra trials LTE-Broadcast". *Telstra Exchange* [blog]. Retrieved from: <http://exchange.telstra.com.au/2013/10/28/telstra-trials-lte-broadcast/>

van Zyl, Gareth (July 19, 2013). "Six African nations have commercial LTE networks – report". *WebAfrica* [blog]. Retrieved from: <http://www.itwebafrica.com/mobile/339-africa/231337-six-african-nations-have-commercial-lte-networks-report>

Blogs that address LTE-Broadcast issues

The 3G4G Blog

- <http://blog.3g4g.co.uk/>

FierceWireless Tech

- <http://www.fiercewireless.com/>

LteWorld

- <http://lteworld.org/>



ITK Vector Inc. is a leading vendor-neutral expert in LTE-Broadcast technology and deployment.

We offer strategy development and product support services to vendors and mobile network operators in the LTE-Broadcast eco-system.

See <http://www.itkvector.com> for other reports and additional information about our services.