IS MOBILE TV (MTV) REALLY A MOBILE DELIVERY VEHICLE (MDV)

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ABSTRACT

Mobile TV has been a technology with consumer interest and great promise of growth but the model of streaming audio and video has not seen rapid adoption. Perhaps a different approach can gain traction. This paper will discuss the content delivery options and business models available on digital multimedia broadcast networks. There will be review of the types of content that can be delivered over these systems including but not limited to stream-based audio and video, traffic information, file-based content, podcasts and downloads. We will examine the new opportunities these networks bring to broadcasters, network operators and content delivery companies that enter this space, and the impact on infrastructure and spectrum requirements. This discussion is based on Harris' experience and involvement with projects and networks around the world.
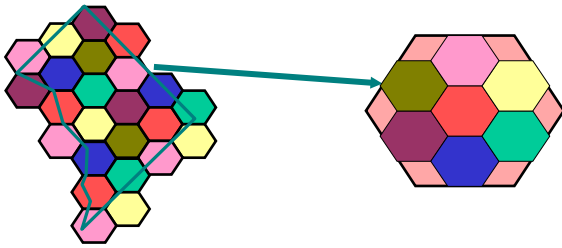
INTRODUCTION

Broadcasters and media network operators around the globe are on the verge of a brand new era in digital multimedia broadcasting. This is at once daunting, challenging and exciting. Mobile TV has been a hot topic of discussion with much anticipation for the past several years; however the adoption has seen differing levels of success in different parts of the world, causing some to refer to it as the "ever receding bonanza." During this same time, consumers continue to use their mobile phones for more and more applications, causing both advancement in the capabilities of the devices and the demands on the networks that deliver the content. While most people think of Mobile TV as the delivery of video streams to the end user on a mobile phone, broadcast Mobile TV is in fact a powerful delivery platform that can be used to distribute a wide variety of content to users on the move. This concept causes us to ask the question if Mobile TV is simply one application that can be delivered over this flexible platform, and if there are others that may offer a faster path to business results. We will explore a few of the possible applications and business implications in this paper based on the extensive experience Harris has with a full range of solutions and its implementation of hundreds of systems using all global standards.
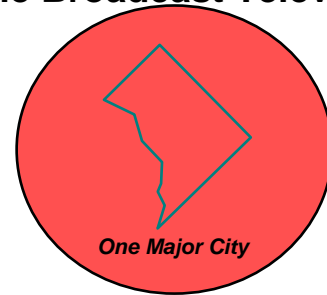
BROADCAST MOBLE NETWORK SCALABILITY

It is no surprise that this early activity into the market and the associated consumer interest has provided the fuel for operators to evaluate extended services. Many of the first extended services offered have been via existing and new mobile phone networks, which allows for the delivery of content now with existing technology, and creates awareness of new services. These new services are often formatted streams of existing content that may be available over other networks now offered on the move for consumer use, or short from clips.

While Mobile TV over a telecom network is often a quick way to introduce services to consumers, it may not be the most optimum implementation of a mobile service. As the demand and awareness of mobile content grows, existing systems that utilize point-to-point connectivity such as unicast or 3G networks will become clogged with traffic. This network congestion is driven by the point-to-point nature of the telecom system which requires a dedicated connection for each user, something which is required for a two-way phone conversation with a friend, but not needed to watch TV or download files. This congestion can be seen in the recent deployment of the iPhone, and the impact on network availability with thousands of simultaneous views of popular streams. AT&T in fact suspended selling the iPhone in New York City in December 2009 due in part because the network cannot support the demand of the rich media streaming and downloads the iPhone supports. Telecom networks additionally are designed with a large number of low-power transmitters or cells interwoven to create total area coverage for a city, region or country. This design is due in part to the need for the even lower power handheld device with a limited range to transmit your side of the conversation back to the tower. The solution to address this network congestion and the large number of cell sites required is to create a broadcast-based Mobile TV network to deliver real-time rich, unidirectional media streams, and leave bidirectional interactivity to the mobile phone network. With this complementary approach, operators can reach an unlimited number of users with rich media content and preserve the capacity on the mobile phone network.

Packet Cellular Video

Mobile Broadcast Television

One Major City

Today there are a wide array of options one could select for the delivery of content over a broadcast delivery platform. ATSC M/H pioneered by Harris and LG in North America complements the ATSC broadcast system, much like DVB-H complements the DVB-T system deployed widely in Europe and around the world. The ISDB-T standard is used in a complementary mode with terrestrial television in Japan and Brazil. There are also several mobile-only type formats, notably MediaFLO developed by Qualcomm and deployed in North America and several trials around the world. CMMB is seeing wide adoption in China, and DMB has seen great success in Korea, China, and parts of Europe, notably Norway. In addition, the newly adopted DVB-T2 standard holds promise for enhanced mobile content delivery with improved payload capacity.

The hallmark of a broadcast approach is one that supports unlimited consumers, and typically a large coverage area from a single or small number of transmitter sites. By leveraging the broadcast approach, the cost to deliver per user drops dramatically as what could be hundreds of sites become as few as one.

FILE-BASED DELIVERY

A multitude of new applications supported on mobile devices offer the ability to select and download content for use on the device. Several devices such as Smartphone, iPhone, and TRO; or connected devices such as the Amazon Kindle or the new iPad promote the ability to select content such as books, songs, games or video content from an online source and download it to the device for personal consumption. In addition to real-time selection of content, one can subscribe to daily or monthly content from sources such as newspapers, magazines and specialty newsletters that are automatically sent to users who subscribe. Currently these downloads or subscription services use the data capability on the mobile phone network for the delivery of the content, and require a one-to-one connection to each user who selects this content in the same way an individual phone call would take place. This type of distribution works well as long as there are a few number of users who subscribe to services. But when subscription climbs, it taxes the capacity of the mobile network.

For example, if you take a large city such as Tokyo with a population of about 12 million people, and only 10 percent of them subscribed to morning news headlines, that would cause 1.2M individual file transfers of the same content to the 1.2M users on a mobile phone network. By contrast, a Broadcast Mobile Delivery platform allows that same file to be broadcast to every user set to receive that content. This dramatic reduction in network resources greatly reduces the demand on the mobile telephone network, and delivers this content at a much lower cost that scaling up the mobile phone network to support the additional demand. In addition the broadcast network can support a large number of file transfers in a fraction of the time required over a mobile phone network since all recipients receive the file at the same time. The one-to-many capability creates an incredibly cost-effective delivery mechanism that can be used in any type of delivery where more than one copy of a file needs to go to more than one person. At first this seems like the application

might be limited to only mass appeal content, but if we look at many of the typical applications of file-downloaded content like movies, music, reading material and games, the top 20 percent of the titles accounts for the vast majority of the downloads. Delivering files of any sort (music, video, games, written word) are all great applications for the broadcast mobile delivery platform known as Mobile TV, which can do it for a lower cost than additional capacity on a mobile phone network. This is an excellent opportunity for mobile operators to use complementary technology in conjunction with their existing networks to delivery consumers the content they want without taxing their networks.

MOBLE DIGITAL SIGNAGE

The out-of-home advertising market is seeing growth as it morphs from the days of static billboards and buss cards to the electronic world of digital signage. Screen Digest reports that digital out-of-home (DOOH) advertising revenues in Western Europe will quadruple over the next five years from €160m in 2007 to €626m by 2012. By 2012, DOOH share is expected to grow to approximately 10 percent of total out-of-home ad revenues. While this is just one region of the world, results are similar in other geographical regions. Delivering content to fixed location signs is easily accomplished by the used of wired networks, but delivering content to moving platforms presents a more challenging task. Public transportation including trains, buses, taxi cabs and ferries offer ideal, captive audiences for digital advertising. The challenge is that these vehicles are always on the move and not tethered to a network. Early attempts to connect to these vehicles often used simple wi-fi connections while located in a terminal or hub, or used a costly connection over a mobile phone network.

There are a few notable examples of using a broadcast mobile network for the delivery of digital signage content. Cabvision in the UK offers content targeted to London cabs utilizing the DAB/DMB network in the UK, and in the U.S. WRAL-TV in Raleigh, North Carolina has launched a system with Harris delivering live content and digital signage to public busses around the city. The WRAL-Harris system uses the bandwidth in the ATSC M/H system to deliver a full-motion video stream with news, weather and advertising to digital signage systems installed on the public buses. WRAL, the local TV station, provides the content and distribution method, and sells advertising space on the signage using its existing sales force.

Digital Signage Business   **MPH Broadcaster**   **Public Transportation**

Advertising Sales Management

Traffic & Billing System

Digital Signage Management System

Advertising Creative Services

Main DTV Program

MPH Insertion

ATSC Transmitter

Local News Weather Sports

. Using this approach the operator can target the content of the advertising to the buses on specific routes, and scale to any number of buses while using the same amount of bandwidth. Early success at WRAL has prompted other U.S. broadcasters to enter early planning stages to implement this type of targeted mobile digital signage in their markets. Mobile digital signage is another ideal application for using the mobile delivery platform known as Mobile TV.

REAL-TIME TRAFFIC INFORMAITON

Traffic is the top issue commuters have to deal with in major cities around the world while on the way to work, school or shopping. The ability to deliver up-to-date traffic information to mobile devices has high value for consumers. The mobile delivery platform is another excellent application for broadcast Mobile TV. The combination of the popular GPS-based navigation systems and real-time traffic update overlays on the map is an ideal use of the mobile delivery platform. Technically the system works much like the application of the digital signage where data is transmitted over the broadcast mobile network, and received by enabled receivers coupled or imbedded in a navigation system. Signals complying with the T-PEG standard are sent over the network and present information on the map display on the navigation system showing areas of congestion, and other traffic-based information needed by drivers. This application is also an example of the same information being delivered to many users simultaneously using much reduced bandwidth as compared to the mobile phone network. All users in the same city receive the same map information, but only the information relevant to the area they are in is displayed. If one were to do this in a city such as Tokyo in our previous example, and again selected 10 percent of the population to access content from an online traffic system such as Google Maps, that would require 1.2M connections for the duration of the commute as compared to the minimal bandwidth needed in a broadcast mobile network for delivery to an infinite number of users. Scalability of such applications where many users receiver the same data is the foundation of the cost-effectiveness of the broadcast based networks. Companies such as i-SET, Navteq, and Garmin offer solutions using broadcast based networks for the delivery of content to users. Traffic information is also being offered using the ATSC M/H system in the current Washington, DC Mobile DTV trials. This is

being carefully watched as a prime application and revenue generating application to drive the broadcast mobile business model.

CONCLUSION

Delivering content to users on the move is a challenge both technically and financially. Finding a solution that meets the ability to reliably deliver the content to the masses and a price point the business model can support is the key balancing point every operator needs to achieve. Diligent evaluation, careful network planning, good financial modelling and critical partner evaluations are all part of making the right choices to ensure you have a successful deployment from day one and over the long term. There are some key points to consider that make broadcast Mobile TV and ideal mobile delivery platform:

• One-to-many capability provide infinite scalability

• Requires fewer transmitter sites and equipment to cover large numbers of people

• Complementary coexistence between broadcast network and mobile telephone network

• Conserve bandwidth on mobile telephone network for services that require one to one connections

• Lower cost per bit per user served

It is important to note that while examining many of the considerations using broadcast Mobile TV as a mobile delivery vehicle, it is key to pick a partner that has the technical capability and financial strength to partner with you to successfully delivery a robust and reliable network.

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