A great opportunity for WiMAX

Mobile TV

Notable for its enormous potential, WiMAX Multicast Broadcast Service (MCBCS) is emerging as the most viable technology for mobile TV, a new service that looks poised to become hugely important for the mobile industry.

By Cao Jie

Great market potential

Mobile Internet is now integral to our modern life. There are generally three major mobile data customer groups, and each is characterized by different needs and tastes. Communication (e-mail, messaging, conferencing), Entertainment (games, video, music), and Information management (databases, documents, note-taking) delineate the main categories, although they possess some overlapping features.

Mobile TV & video presently account for one third of the mobile Internet market. Based on falling prices due to increasingly mass application and consumption, this figure is destined to rise dramatically. Gartner statistics indicate that mobile TV users - including unicast - will reach 1 billion by 2012.

This prediction is consolidated by existing, widespread commercial deployment trends. In 2004 NTT DoCoMo launched the world's first mobile TV service based on unicast technology. This was soon followed by SKT in 2005 and by Verizon, who provide mobile TV via DMB broadcasting and Media flow technology respectively. To date, around 30 countries have deployed mobile TV networks, and this number is rising on a monthly basis. It’s believed that mobile TV will start to boom in the 2008 - 2009 timeframe.

Leading WiMAX MCBCS technology

Competition promotes mobile TV

The rapid evolution of mobile technology supports higher capacity networks, and as such is both enabling and accelerating the popularity of mobile TV. Originally voice formed the successful driver for 2G networks and, today, video and TV underpin 3G deployment. The evolution from 3G to 4G is set to be stimulated by services that offer
enhanced quality. Quality indicators span increased bandwidth, elevated sophistication in terms of large-scale information provision, and improved customization capabilities. The maturity of key 4G technologies such as OFDMA, MIMO, and optimized MAC scheduling algorithms realize a range of desirable features. These include enhanced handover and mobility, major infrastructure design requirements that promote a rapid response, elevated session rates, increased capacity, reduced user charges, swift return on investment (ROI) for operators, and simplified autonomous terminals. WiMAX, in this context, describes a leading choice for pre-4G technology. Its rapid time to market provides an ALL IP flat network solution that can complement existing 2G/3G networks so as to deliver mobile TV and video services with a guaranteed Quality of Service (QoS).

Based on the mobile access methods mentioned above, Table 1 details a variety of competing technologies that are available for mobile TV service provision. The three main categories cover mobile and broadcast networks, and DVB-SH for satellite. The availability of multiple broadcasting technologies offers operators more options to choose from, and vendors richer experiences in mobile TV solutions. Additionally, the competition between different technologies is necessary to promote the development of mobile TV.

WiMAX MCBCS: the right choice

Given that 3G networks are currently under utilized, some mobile operators are offering streamed TV and video content at highly attractive prices to encourage consumers to adopt and use their services. However, the capacity of a typical voice-centric WCDMA network tends to quickly reach its limit when accommodating increases in both traditional voice and data applications. WiMAX neatly sidesteps this capacity issue.

WiMAX TDD, which operates under a duplexing mode, is best suited for data applications and advanced antenna technologies. The rapid scheduling of uplinks and downlinks realizes bandwidth requirements for different applications. Flexible and diversified mobile TV and video service business models are facilitated, which results in maximized profit margins for operators.

The WiMAX Forum MCBCS sub team has been aggressively pursuing related standard development. The team has completed the first draft for MCBCS Stage 2 base line text and finalized it at the Taiwan FtF meeting in October 2007. MCBCS is expected to be fully issued by Q2 2008.

In terms of network deployment, operators are broadly concerned with economic development, rapid ROI coupled with a long-term evolution potential that protects investment, device availability, appropriate pricing, and smooth upgrade capabilities can accommodate nascent applications. WiMAX is based upon a 2-layer ALL IP network architecture and is widely regarded as a cost-effective means to provide VoIP and data services. The WiMAX Forum is committed to enabling MCBCS with minimal changes to existing networks in order to support mobile TV & video. Mobile WiMAX has enjoyed a long-term and smooth transition route towards 802.16m, which allows a network to support peak data rates with at least 6.5bps/Hz for downlinks, and 2.8bps/Hz for uplinks. Particularly with 802.16m, a dedicated carrier will be allocated for MCBCS. Optimized switching between broadcast and unicast services can be achieved, and the maximum MCBCS channel reselection interruption time is 1 second for intra frequency and 1.5 seconds for inter frequency. All these features give WiMAX operators a considerable advantage in terms of MCBCS adoption and a tangible lead with respect to mobile TV & video service provision.

The above analysis underpins our belief that 3G-based enterprises should boost ARPU by taking advantage of the unused capacity and availability that can be found in multicast broadcast technology. This can fulfill the needs of mobile TV & video service users who form a third of the mobile Internet market. However, we

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<th>TV Centric</th>
<th>Telco</th>
<th>Satellite</th>
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<td>DVB-H</td>
<td>T-DMB</td>
<td>M-FL0</td>
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<td>Commercial launch in Italy, Finland, South Africa etc; terminals available</td>
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are aware that both unicast and multicast based on a 3G network are cost prohibitive in a mass market context.

High levels of investment are necessary for the deployment of proprietary mobile TV technologies based on satellite networks. The cost per subscriber is expedient, but applications are unable to be personalized. Satellite, therefore, is only a temporary or complementary choice to broadcast architectures.

WiMAX MCBCS, however, renders multicast cost-competitive with broadcast technology, and it is scaleable to serve the mass market. Thus, it forms a long term solution for the mass consumption of mobile TV & video applications.

An innovative approach

The WiMAX mobile TV solution

With this vision in mind, Huawei has partnered with NextWave, a global provider of mobile multimedia and mobile broadband technologies, to announce a strategic agreement that seeks to jointly develop the market advanced WiMAX broadcast solutions for mobile operators worldwide. This collaboration will bring WiMAX solutions to the market more rapidly, and offer a cost effective way to meet the growing need for mobile TV and broadcast services.

WiMAX MBS solution features simple design and ALL IP flat architecture, as illustrated in Fig. 1. On the access network side, there are base stations (BSs) and a gateway. In the core network, a MBS Controller (MBSC) is connected to the content server that can operate under the control of an operator or a third party. AAA is employed to perform authentication and authorization with appropriate user profile information, collect billing information, and then send it to the Business Operation Support System (BOSS). To provide this solution, NextWave is working on the IP Encapsulator and MBSC. Huawei is providing the following network elements and associated functionalities: ASN-GW, BS, and AAA.

The two ways to provide mobile TV are through unicast and broadcast, and they differ in three basic aspects: channels (dedicated or common), requirements (individual or general), and tariffs (high or low). Mobile TV services usually embody a basic service need in the form of programs with mass appeal. Examples include live sporting events and real-time news. Pay-to-view prime time programs target a given user group with specific interests, and these are not necessarily live programs.

Therefore, we suggest using broadcast for basic services and unicast for targeted services. Given this, the Huawei/NextWave solution delivers a flexible business model that responds to the varied demands of both mass and specific user groups.

Coherent partnership-based development

As a key player in the WiMAX Forum, Huawei has been notably proactive, and currently enjoys a leading position in MCBCS development. In January 2007, Huawei proposed the first complete MCBCS technical solution (MXtv) to the WiMAX Network Working Group (NWG), and this now forms the base for proposal integration. NextWave finalized MXtv, and by doing so realized a milestone in a process that has given the company a wealth of experience in the mobile TV field. NextWave is continuing to closely liaise with Huawei regarding the formation of a standardized technology.

In April 2007, Huawei successfully demonstrated its WiMAX solution for real-time monitoring to China Mobile and, as such, was selected to provide the mobile broadband network to support mobile video applications for the 2008 Olympic Games in Beijing.

Huawei’s rich experience in next generation broadband networks has positioned it as a leader in a range of telecommunication fields, including IP and mobile transmission. Furthermore, we are active in discussions with other companies concerning the provision of chipsets and related solutions.

During CTIA 2008, Huawei showcased the fruit of its partnership with NextWave by demonstrating the extremely well received mobile TV solution. We thus anticipate a robust end-to-end WiMAX mobile TV solution that will be available for commercial launch by the second half of 2008.

Embracing the spirit of partnership that is central to cohesive development, Huawei is currently working with over 100 global operators to progress WiMAX deployment and applications. To date, we have been awarded 17 WiMAX contracts and over 35 trials, which are serving to accelerate the future development of mobile TV. We are certain that mobile TV represents a great opportunity for WiMAX.