ERICSSON

February, 2008

**PRESS BACKGROUNDER**

# HSPA, LTE AND BEYOND – DELIVERING RICH COMMUNICATION, CONNECTIVITY AND ENTERTAINMENT OVER TRUE MOBILE BROADBAND

*The online multimedia world made possible by broadband has changed people's perceptions of data speeds and network service quality. Regardless of where they are, consumers no longer accept slow speeds on their laptops and mobile devices, as they send and receive corporate email, music or video clips. From the network operator and service provider perspective, speed isn't the only issue – more network capacity is needed to handle the growth in mobile traffic from both business and private users.*

To address these issues, Ericsson has led the development of High Speed Packet Access (HSPA), a standardized evolution of Wideband Code Division Multiple Access (WCDMA), the world's leading third generation mobile standard. Ericsson is also at the forefront of Long Term Evolution (LTE) of 3G networks, which will deliver even higher broadband speeds.

With current download speeds up to 14.4Mbps (current commercial devices support up till 7.2Mbps) and upload speeds of 1.4Mbps, HSPA offers users fixed broadband speeds from their notebooks and other devices anywhere there is coverage. People can experience a rich combination of voice, text, audio, photo and video content wherever they go. The coming years will see these data rates increase substantially, and operators will be able to more than double their system capacity and reduce latency delays for interactive services.

With reduced delay, users will enjoy shorter response times for interactive applications such as mobile office, and fast Internet access for gaming and audio and video downloads. Additionally, the faster uplink will improve user experience of mobile broadband services such as video conferencing, uploading user-generated content and sending e-mail with attachments.

For users, such capabilities mean a simpler, but enhanced, mobile experience. They help bring people closer together and give them more flexibility and control over their daily working and private lives. They also begin to realize the potential for mobile vertical applications in areas such as healthcare, public safety, travel and transport, utilities and manufacturing.

## HSPA going strong

HSPA is already a huge success. There are already more than 170 commercially deployed HSPA networks, serving subscribers in over 75 countries worldwide (February 2008). What's more, a burgeoning ecosystem of mobile broadband devices and services has emerged around the technology. For example, there are over 400 HSPA-enabled devices launched on the market – including phones, notebooks, PC modems and wireless routers.

Out of the estimated 1.8 billion people who will have broadband by 2012, some two-thirds will be mobile broadband subscribers. By this time, analysts predict that almost 200 million notebooks will ship annually, and Ericsson believes that already 2011 at least half of these will have HSPA embedded modules.

Experience from several countries has shown that adoption rates soar as soon as mobile broadband is available below a US$30 price point for unlimited monthly usage.

Ericsson works with close to half of all operators, which have commercially launched HSPA to date, to launch commercial HSPA services quickly and cost-efficiently. Consistent with Ericsson's tradition of supplying future-proof products based on cutting-edge technology, introducing HSPA requires only a software upgrade of its existing WCDMA radio base stations (RBSs).

HSPA provides mobile broadband capacity and coverage without the need to add additional frequency carriers in the RBS. Instead it makes efficient use of the shared resources in the base stations that are also used for voice and other services. This enables operators to provide simultaneous voice, video and data services and shared channel high-speed data services (multi-services) over the same carrier – thanks to two- to three-fold increase in system data capacity.

The next phase of the technology, HSPA Evolution, will ultimately bring end-user data rates up to 42Mbps in the downlink and 12Mbps in the uplink. This is made possible through the transmission of multiple parallel data streams to a single terminal using a technique called Multiple Input Multiple Output (MIMO), combined with higher-order modulation techniques.

2x2 MIMO doubles the potential downlink data rate using multiple transmit and receive channels and antennas to improve performance and throughput. Separately, using 64QAM (Quadrature Amplitude Modulation) provides a 50 per cent increase in potential downlink speed. By combining 2x2 MIMO and 64QAM, data rates of up to 42Mbps can be achieved on the HSPA downlink. Furthermore, on the HSPA uplink, the introduction of 16QAM provides data rates of up to 12Mbps.

## Long Term Evolution … and beyond

The Third Generation Partnership Project (3GPP) standard initiative, LTE, improves the user experience even more. It will enhance more demanding applications like interactive TV, mobile video blogging, advanced games and professional services. On January 17, 2008, 3GPP confirmed that the LTE Terrestrial Radio Access Network technology specifications have been approved and are now under change control, leading to their inclusion in the forthcoming 3GPP Release 8.

LTE provides a clear evolution path to meet future demands for a system that supports different spectrum allocations. It will provide smooth migration for 2G, 3G and other radio spectrum (including TV bands) for use in future mobile communication networks. The standard, sometimes referred to as 'Super 3G', is specified for data rates of at least 100Mbps in the downlink and latency below 10ms. Ericsson has already demonstrated LTE at data rates of 160Mbps, and expects LTE to be commercially available in second half of 2009.

Operators gain deployment flexibility and simplicity from LTE. It offers a choice of carrier bandwidths – from 1.4MHz to 20MHz – and supports both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) access. Ten paired and four unpaired spectrum bands have so far been identified by 3GPP for LTE, and there are more to come. This means that an operator may introduce LTE in 'new' bands where it is easiest to deploy 10MHz or 20MHz carriers, and eventually deploy LTE in all bands.

LTE radio network products will have a number of features that simplify the building and management of next-generation networks. For example, features like plug-and-play, self-configuration and self-optimization will simplify and reduce the cost of network roll-out and management. LTE will be deployed in parallel with simplified, IP-based core and transport networks that are easier to build, maintain and introduce services on.

In addition to mobile phones, many computer and consumer electronic devices, such as notebooks, ultra-portables, gaming devices and cameras, will incorporate LTE embedded modules.

Since LTE supports hand-over and roaming to existing mobile networks, all these devices can have ubiquitous mobile broadband coverage from day one.

In summary, operators can introduce LTE flexibly to match their existing network, spectrum and business objectives for mobile broadband and multimedia services.

Looking beyond LTE, the International Telecommunication Union (ITU) defines ‘4G’ as network technology with throughput of 100Mbit/s for wide area/mobile use and 1Gbps for hotspot coverage to be applied in new spectrum bands with 100MHz channels. Such systems will be commercially available to meet these requirements long beyond 2010.

*Ericsson is the world's leading provider of technology and services to telecom operators. The market leader in 2G and 3G mobile technologies, Ericsson supplies communications services and manages networks that serve more than 185 million subscribers. The company’s portfolio comprises mobile and fixed network infrastructure, and broadband and multimedia solutions for operators, enterprises and developers. The Sony Ericsson joint venture provides consumers with feature-rich personal mobile devices.*

*Ericsson is advancing its vision of ‘communication for all’ through innovation, technology, and sustainable business solutions. Working in 175 countries, more than 70,000 employees generated revenue of USD 27.9 billion (SEK 189 billion) in 2007. Founded in 1876 and headquartered in Stockholm, Sweden, Ericsson is listed on the Stockholm, London and NASDAQ stock exchanges.*

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