WHAT IS WCDMA/HSPA?

The online multimedia world made possible by mobile broadband has changed people’s perceptions of data speeds and network service quality. Regardless of where they are, consumers no longer accept slow speeds as they send and receive e-mail, music or video clips on their laptops and mobile devices. 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), a world-leading mobile standard. Ericsson is also at the forefront of Long Term Evolution (LTE), which delivers even higher broadband speeds.

With current commercial download speeds reaching 42Mbps, HSPA offers users fixed broadband speeds from their iPads, tablets, smartphones and other devices – network coverage permitting. 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 double their system capacity while reducing latency delays for interactive services.

LTE is the next generation of mobile communication technology. More information on LTE can be found on the LTE Media kit [1]

Mixed mode in multi standard RBS 6000, including GSM, WCDMA and LTE cater for lower site costs and efficient traffic migration.

Just as LTE is the next step in the evolution of mobile networks, Evolved Packet Core (EPC) represents the next step in the parallel evolution of packet core networks. One of the key highlights of EPC is its ability to handle multiple access technologies. Thus, it provides a smoother migration for operators and selected sites can use LTE access while the rest of the network remains on 2G/3G access. Combined with HSPA and LTE access networks, EPC provides users with true broadband access, to a wide variety of applications while significantly reducing the cost of ownership for operators.

Mobile broadband brings people closer together and gives them more flexibility and control over their working and private lives. Mobile applications in areas such as health care, public safety, travel and transport, utilities and manufacturing, are of increasing importance.
HSPA is a huge success. As of November 2013, there were more than 537 commercially deployed HSPA networks, serving subscribers in more than 204 countries worldwide. What’s more, a burgeoning ecosystem of mobile broadband devices and services has emerged around the technology. For example, more than 4,000 different models of HSPA-enabled devices have been launched, including feature phones, smartphones, notebooks, PC modems, touch pads and wireless routers.

Ericsson estimates 8 billion people who will have mobile broadband subscription by 2019. According to the Global mobile Suppliers Association (GSA), as of October 2011 100 percent of the world’s WCDMA operators had deployed HSPA on their networks.

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

Ericsson supplies Radio Access Network equipment to nearly half of all operators that have commercially launched HSPA. Consistent with Ericsson’s tradition of supplying future-proof products based on cutting-edge technology, its customers’ upgrade to HSPA required only a software upgrade of its existing WCDMA radio base stations.

HSPA provides mobile broadband capacity and coverage using the same resources in the radio base stations that are used for voice and other services. This enables operators to provide simultaneous voice, video and data services, as well as shared channel high-speed data services (multi-services) over the same carrier – thanks to a two- to three-fold increase in system data capacity.

The next phases of HSPA Evolution will increase end-user data downlink speeds to 336Mbps and beyond. 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 and multi-carrier techniques. MIMO doubles the potential downlink data rate using multiple transmit and receive channels and antennas to improve performance and throughput.

Multi-carrier technology enables consumers to receive data simultaneously on two, three or more frequency channels. This increases the user data rate in the coverage area of an HSPA network and also on the cell edge, where consumers normally experience lower data rates.

As the number of smartphones connected to a network increases and usage of heavy data generating applications surges, uplink capacity is becoming more and more important. Ericsson’s commercially available receiver technology, Ericsson Interference Suppression,
with quad-antenna radio base stations, improves the uplink capacity by a factor of three.

Improving uplink capacity with these technologies offers operators an elegant way to better serve a greater number of customers, who increasingly choose to upload information from mobile devices to cloud services – for example, when sharing photos over social networks. Furthermore, on the HSPA uplink, the future introduction of 16-QAM modulation, MIMO and multi-carrier technology could provide data rates of up to 24Mbps and even higher. The network capacity is further increased with functions such as Fast Dormancy which will dramatically decrease the time the smartphone is in the most resource-intensive state and Continuous Packet Connectivity (CPC), which has the effect of dramatically improving uplink capacity by limiting interference.

Many commercially available smartphones already use Fast Dormancy and growing numbers are appearing with CPC.

Further, up to 60 percent of the data bursts in smartphone networks are below one kilobyte. HS FACH, E-FACH are two features that enables operators to provide more efficient means to handle these small data bursts. These features also includes improved downlink and uplink—uplink is important for social networking apps. Together they reduce signaling, improve bandwidth capacity and provide a faster experience for the end user.

The ability to extend WCDMA/HSPA coverage efficiently is vital to turning the proliferation of low-cost HSPA smartphones into increased revenue from MBB services.

One key way of doing this is to refarm the 900MHz spectrum from GSM to WCDMA/HSPA. This spectrum typically gives a 6 dB link budget advantage over the 2,100MHz spectrum, which translates into substantial coverage advantages.

Other WCDMA/HSPA coverage-enhancing measures include four-way receiver diversity (rather than two-way), lower speech rate for better voice coverage, and the capability for improved scaling of control and traffic channels.

The Psi Coverage solution is an Ericsson unique cost-efficient product designed for building cost-efficient HSPA to meet coverage demands in low/medium populated and light traffic areas.

**EVLDEVED PACKET CORE FOR MULTI-ACCESS**

EPC is a flat and efficient, IP-based core network architecture that supports all types of network access and provides device and service mobility across all networks. In the simplified, flat architecture for LTE, there are only two node types in the traffic plane – base stations (eNodeBs) and packet gateways (S-GW and PDN-GW). This makes it inherently more efficient, bringing higher throughput and faster response times. This architecture is
designed to optimize network performance, improve cost-efficiency and facilitate the uptake of mass-market, IP-based services like mobile broadband.

Ericsson offers a complete EPC portfolio with all the features needed by operators to implement LTE. The same EPC nodes can be used also for GSM/EDGE, WCDMA/HSPA, CDMA and wireline access. This streamlines operations and enables a smooth migration, with the introduction of LTE in metropolitan areas while relying on GSM/WCDMA or CDMA for nationwide coverage during a transitional period. All of this can be achieved with a minimum of traffic disturbances, as mobility between the different access technologies is supported.

Operational expenditure reduction has been a key consideration for the design and development of Ericsson’s EPC. The result is fast and easy installation, hassle-free integration and deployment with a minimum of preparation and manual interaction. A common EPC network also enables the consolidation and pooling of centralized functions such as mobility management (MME), authentication, security, traffic inspection and policy control, and charging.

February 2012 the Evolved Packet Gateway (EPG) based on the Smart Services Router (SSR 8000) Family for EPC was launched.

Ericsson has pioneered the introduction of all packet core technology and has a solid leadership position in the packet core arena. We have unparalleled experience in the deployment and operations of commercial LTE/EPC networks. As of February 2013, 58 live commercial networks rely on our EPC solutions to generate revenue from new and compelling multimedia services.
REFERENCES

1. LTE Media kit http://www.ericsson.com/thecompany/press/mediakits/lte

NOTES TO EDITORS

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Ericsson is the world’s leading provider of communications technology and services. We are enabling the Networked Society with efficient real-time solutions that allow us all to study, work and live our lives more freely, in sustainable societies around the world.

Our offering comprises services, software and infrastructure within Information and Communications Technology for telecom operators and other industries. Today more than 40 percent of the world’s mobile traffic goes through Ericsson networks and we support customers’ networks servicing more than 2.5 billion subscribers.

We operate in 180 countries and employ more than 100,000 people. Founded in 1876, Ericsson is headquartered in Stockholm, Sweden. In 2011 the company’s net sales were SEK 226.9 billion (USD 35.0 billion). Ericsson is listed on NASDAQ OMX, Stockholm and NASDAQ, New York stock exchanges.

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