

EDGE Update

Software and Hardware Support for EDGE Service Improvement

Motorola Reach Solutions



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Motorola continues to support the rollout and growth of EDGE to support high-speed mobile data service on new and existing GSM networks. As the rollout of EDGE continues, the end user expectation of GSM data services continues to increase. New applications test the data speeds and service providers are looking for improvements to keep pace with these needs.

The GSM Suppliers Association has published the following information on the adoption of EDGE in their May 4, 2006 EDGE Operators Worldwide datasheet.¹

- 204 networks in 113 countries deploying GSM/EDGE networks
- 151 commercial networks in 88 countries
- 67 service providers operating or deploying combined EDGE/WCDMA network
- EDGE deployments are spreading in Middle East, Africa, Europe

The GSA paper also highlights how service providers are now recognizing that EDGE is a complementary service to 3G and HSDPA.

The latest mobile handsets offer a number of new standards-based features that can both improve the end-user experience and give benefits to service providers. Motorola is implementing support for some of these in the new GSM software release GSR 9 in 2007.

Increasing data capacity in the network also becomes an issue as the number of subscribers and their usage of data both increase. Hardware changes in the Motorola Reach GSM portfolio will support increased EDGE capacity.

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Details on the release dates are contained in the Motorola Roadmap, available from your Motorola regional contacts.

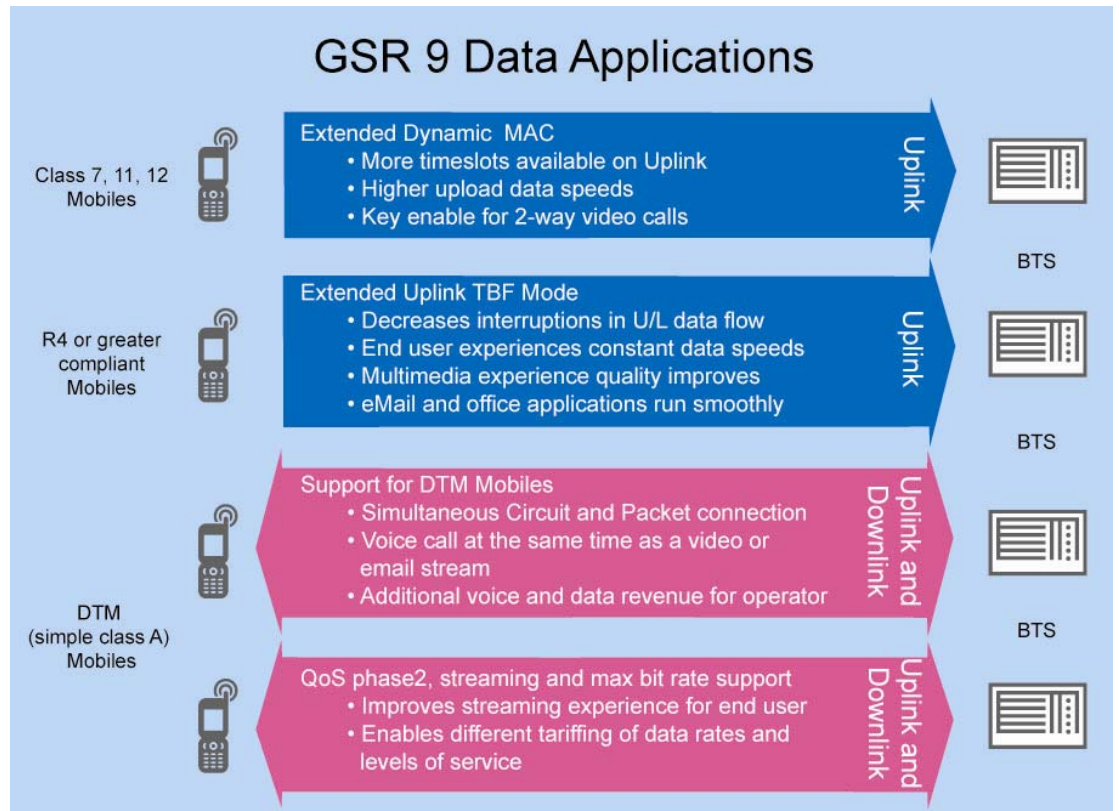
SOFTWARE FEATURES IN SUPPORT OF EDGE

The 2007 GSR 9 release includes the following features for enhanced GPRS and EDGE-based data service. Taken together, they will significantly improve the service provider's revenue by enabling advanced services and increasing throughput.

- Dual Transfer Mode (DTM) will support simultaneous circuit and packet traffic. A key revenue generator for service providers will be 3G-like services on their 2G network, for example "see what I see". Service for end users will also be improved.
- Features such as Extended Dynamic MAC (Medium Access Control) and Extended Uplink TBF (temporary Block Flow) Mode will increase uplink speeds and overall throughput by using up to four uplink timeslots of EDGE, to a maximum speed of 238 kbit/s.
- The Quality of Service (QoS) feature is also enhanced with support for streaming class traffic and Maximum Bit Rate Enforcement. These allow a service provider to more reliably offer new data services or to offer differential data tariffing based on Grade of Service (GoS) offered.



The following diagram illustrates these features.



EDGE ON EXTENDED RANGE CELL

The Extended Range Cell feature has been available in the Motorola GSM system for some time. This offers an extended range voice service out to a maximum of 120km cell radius where propagation allows. Service providers in both mature and emerging countries have requested the availability of data services with this feature allowing them to provide a very wide area data service, for example to islands and coastal regions, farms or medical centers in remote locations. Motorola will release Data over Extended Range Cell in a GSR 8 Feature Pack in 2007. This will support both GPRS and EDGE in the extended range mode.

IMPROVED TIMESLOT SHARING FOR HORIZON CTU2 RADIO

The current CTU2 radio platform supports two carriers of voice or one carrier of EDGE data traffic. With the GSR 8 Improved Timeslot Sharing feature, we can now provide the EDGE capability without the need to sacrifice the two-carrier voice capacity when it is needed.

When transmitting EDGE data using switchable timeslots (TS) the total capacity of 16 TS is reduced as one TS from each carrier is combined for every TS needed to carry 8PSK traffic. The individual carrier timeslots that were combined for EDGE can be available individually to carry voice traffic depending on the cell loading and the configuration used.

For example, if the radio is configured with four switchable EDGE TS then the total number of timeslots available for the two carriers will vary from 16 TS for voice (no data active) to eight TS for voice plus four TS for EGPRS. While there is some reduction in capacity, the effect on the overall network is insignificant when EDGE traffic is still building and most importantly, the full voice capacity of the two carriers is available when needed.





EDGE EVOLUTION

3GPP Release 7 is still in the standardization process but it very likely will include further enhancements to data services running on GSM networks. Both service providers and end users have had good experience using EDGE as a wide area data service. As a result, service providers and manufacturers alike are now promoting EDGE as a complementary service to 3G and HSDPA.

The rollout of 3G and HSDPA in city and business locations can only further increase the expectations of end users who want 'continuity of experience' when in areas not served by 3G or HSDPA. EDGE today can be considered as a 100–200kbit/s service – the proposals being considered for EDGE Evolution would push EDGE into the 200–300kbit/s class of service.

Motorola is active in the standards bodies that are specifying these improvements and is carefully considering the implications on future GSM hardware and software platforms. We recognize that service providers want improvements that minimize the hardware changes in their GSM networks. To date, Motorola has been very successful in making it possible for older networks to be upgraded to EDGE. We continue to work closely with user groups on EDGE Evolution, pushing for improvements that have a strong business case while minimizing the upgrade cost to service providers.

NEW HORIZON CTU2-D RADIO

Motorola will introduce a new CTU2-D radio in 2007, specifically developed to address the demands of high data usage with EDGE. As data services usage increases, more radio capacity will be used for EDGE data relative to voice traffic than is currently the practice.

The CTU2-D will allow one of its two carriers to be fully utilized for EDGE traffic (all eight TS carrying 8PSK traffic in both the up and downlinks) with zero loss of voice capacity on the second carrier. For applications that make significant use of downlink data capacity, such as streaming, the CTU2-D will optionally allow full use of both carriers for EDGE 8PSK traffic in the downlink. Bi-directional GMSK based traffic is always allowed on any or all timeslots of both carriers.



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