GPRS brings services alive

NOKIA
CONNECTING PEOPLE

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With GPRS, operators can offer new, attractive services and exciting multimedia content, shifting their focus from the implementation of the technology to how it will change people's lives.

With Nokia GPRS, operators can position themselves as leaders in the fast-growing data services market.

GPRS has quickly become an established technology. Nokia currently has more than 70 GPRS contracts, with more than half of these launched as commercial networks.

The potential for GPRS to create new business for operators has been clearly shown by the early success of Multimedia Messaging Service (MMS). MMS is widely accepted as being capable of generating significant revenue from a fast-growing global penetration.

The focus now is on the services that GPRS and other 3G technologies make possible. GPRS is rapidly bringing Internet Protocol (IP)-based services to the mobile mass market. It is clear that in advanced mobile communications markets, packet-switched traffic will overtake circuit-switched traffic within a few years.

These new services will fundamentally change the conventional ways of managing our lives and conducting business.
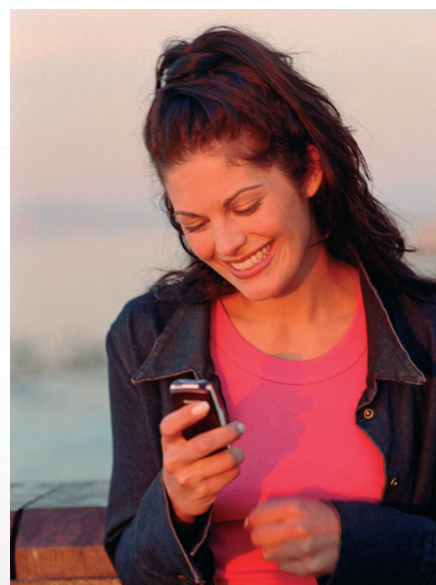
From packet data to data in every pocket

Because GPRS provides continuous IP connectivity, fast session setup and practical access rates of 30 to 40 kbps, it opens the door to entirely new, innovative mobile applications. These include MMS, mobile business connectivity, remote control and maintenance of appliances and any number of monitoring or surveillance applications.

Mobile services can be defined by the following three categories

Person to person mobile services

The continuing success of SMS services and the early triumph of MMS services demonstrate the value of this category. Yet there is still huge growth potential, particularly from the new packet data capabilities of GPRS and other 3G technologies.

Content to person mobile services

Content downloading to mobile terminals is on the verge of an explosive boom. Java™ and generic content downloading of games, ringtones, icons and screensavers as well as new services such as video streaming, are leading the surge as an increasing variety of handsets with large colour screens, extensive internal memory and Java compatibility become available.

Mobile Business Connectivity

It is estimated that nearly a third of professional personnel spend at least one day per week working away from the office. With GPRS these users have efficient tools for remote use of business applications. Complementing GPRS access with Operator Wireless LAN capability further enhances the remote availability of applications such as calendar, corporate intranets and the Internet and encourages a significant boost in operator revenue. Growth in advanced business services will be assured as more companies achieve mobile connectivity.

With Nokia Intelligent Content Delivery, operators can create innovative business models and position themselves exactly where they want within the packet-based services value chain by upgrading their existing packet core network. Nokia Intelligent Content Delivery provides the tools for greater control over revenues from different services.
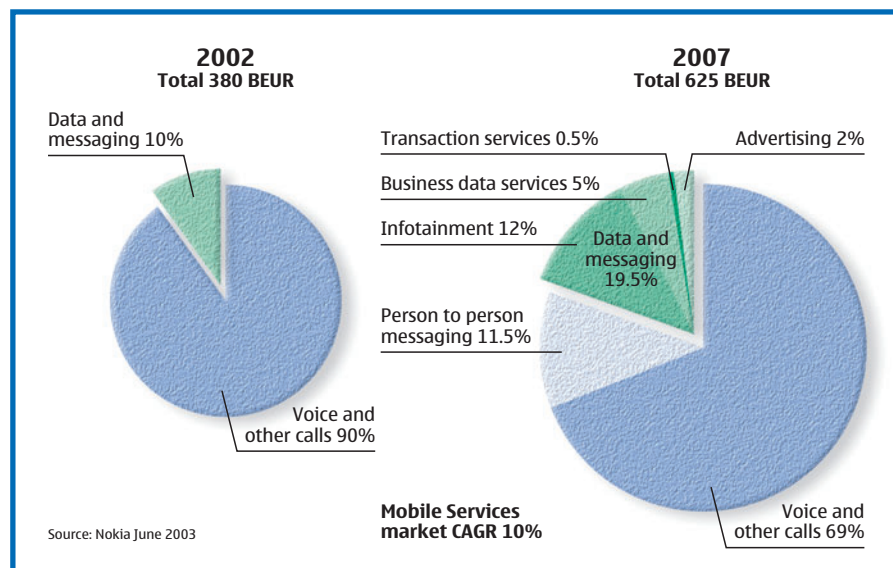
WAP comes alive

GPRS is an ideal bearer of services based on Wireless Application Protocol (WAP), which is an open platform for the development of wireless services compatible with a variety of digital mobile phones and other wireless terminals. At last, with the speed of GPRS and new handsets featuring colour screens, WAP is set to show its true potential

You can launch WAP services quickly using a Nokia WAP partner and the Nokia WAP Gateway as the service delivery platform.

The Nokia GPRS solution enables you to connect with the fast-growing data market, while your users stay connected to the information they value.

June 2003 forecast of mobile services. Global Mobile Service Revenues (Base Case, BEUR)

2002
Total 380 BEUR

Data and messaging 10%

Voice and other calls 90%

Source: Nokia June 2003

2007
Total 625 BEUR

Transaction services 0.5%

Business data services 5%

Infotainment 12%

Data and messaging 19.5%

Advertising 2%

Person to person messaging 11.5%

Voice and other calls 69%

Mobile Services market CAGR 10%

Build for the future, succeed today

Upgrading your current GSM radio network to GPRS is a straightforward process. The Nokia solution makes it easy by including new software that can be remotely downloaded to Nokia base stations without the need for site visits, cutting the time and cost of implementation. Nokia's powerful resource management algorithms help you get the highest possible capacity from your BSS, giving users a better quality of service.

The Nokia solution is built on proven IP technology and is designed to be flexible – allowing you to start small and expand capacity as your business grows, while keeping transmission and interconnection costs to a minimum.

The Nokia GPRS solution also supports 3GPP standards for interoperability and roaming. GPRS roaming is a key issue and the number of GPRS roaming agreements is expected to expand into the thousands, following the successful path of GSM roaming which currently has about 20,000 roaming agreements in place.

The core of your business

The Nokia GPRS core network protects your investment by evolving smoothly and cost-effectively to encompass other technologies from EDGE to WCDMA. This means that a significant part of your investment in hardware, software and skills can be re-used when upgrading your GPRS network.

Nokia SGSN

The Nokia Serving GPRS Support Node (SGSN) provides highly scalable, modular subscriber management services, matching the demands of the radio network to the IP core. Important functions of the SGSN include mobility management, user authentication, signaling to the mobile switching centre and collection of billing data. Using the proven Nokia multiprocessor-computing platform with built-in redundancy, the Nokia SGSN provides excellent system reliability to maximise your investment.

Nokia Intelligent Service Node

In the Nokia GPRS network the Gateway GPRS Support Node (GGSN) functionality that provides secure connections from the GPRS network to the Internet and corporate intranets is performed by the Nokia Intelligent Service Node (ISN).

In addition to these basic GPRS connectivity functions, the ISN analyses both the traffic and content of the user data flow. A key capability of this combined architecture is that it provides a single access point for the user connection while at the same time, several access points to serve the operator and third party services.

The result is a greatly simplified user experience with one-click access to all the different types of content and available services. This eliminates the irritating procedure of manually reconfiguring the handset on each reconnection when accessing different services, such as picking up e-mail, sending a multimedia message or browsing WAP pages.

Bringing intelligence to content delivery

This one-click access to all services is one of the major benefits of the new Nokia Intelligent Content Delivery (ICD) system. Using the Nokia ICD system to connect subscribers to content, operators can also charge according to the value of that content and the traffic generated. Differentiating access and traffic charging offers more flexibility in service provisioning and differentiation. The price can depend on the service access point, the protocol used (for example, e-mail, WAP browsing, MMS), the URL address or even the user's service profile.

The Nokia ICD solution is integrated with the Packet Core to reduce changes to the current network infrastructure and enable Quality of Service (QoS) to be controlled according to application and service needs. The QoS mechanisms implemented in the Packet Core provide a cost-effective way to implement high quality services with service quality differentiation. The Nokia Intelligent Content Delivery solution consist of the Nokia Intelligent Service Node (ISN), the Nokia Charging Gateway (CG), the Nokia Online Service Controller (OSC) and the Nokia Subscription Manager (NSM).

Postpaid and prepaid charging

The Nokia GPRS solution includes two elements to maintain accurate and reliable charging for services, for both prepaid and postpaid users.

The Nokia Charging Gateway collects and processes Charging Detail Records (CDRs) generated from postpaid and hot billing prepaid sessions and provides a single interface with the postpaid billing system, which significantly reduces traffic to the billing system.

The charging information generated by the SGSN and GGSN is relayed to the Charging Gateway, which then consolidates and pre-processes the data records before forwarding them, reducing the processing load on the billing system.

While the Nokia Charging Gateway looks after the charging for postpaid accounts, the Nokia Online Service Controller (OSC) brings online charging and credit control to manage prepaid subscriber account balances. Vitally, the OSC checks the credit on the user's prepaid account and if this runs out, tells the saGGSN to deny the service to the subscriber until a top-up has been made. Service denial can follow a set of rules to, for example, allow access to certain destinations but block other destinations.

Nokia Subscription Manager

The Nokia Subscription Manager (NSM) supplements existing subscriber service databases by consolidating subscription information for mobile packet data services into a single store and ensuring its consistency. It provides a single interface to the operator Business Support System, hiding the complexity of the underlying network structure.

The NSM is easily configured to adapt to new services and service attributes, saving operational costs and helping to increase customer loyalty and satisfaction.

Nokia NetAct™

Nokia's operations support system – Nokia NetAct™ – is a multivendor, multitechnology and multiservice management framework based on industry standards and open interfaces.

Nokia NetAct provides a future proof, scalable framework for operating the network or service provider's entire managed network, including GSM/EDGE, GPRS and WCDMA. As new technologies emerge, they will co-exist in the operator's network with previous ones. In this multi-radio environment it is even more important to have one management system in control.

With Nokia NetAct, sharing applications, databases and working methods across all technologies brings a streamlined information flow, achieves significant cost savings and speeds up the learning curve for IP management procedures.

Secure the differentiator for success

GPRS enables new IP-based mobile services, including e-commerce and access to corporate intranets, which demand excellent data security. With Nokia's GPRS solution, you can provide your customers with secure, reliable connections using integrated end-to-end security features.

In addition to state-of-the-art GSM security techniques, Nokia's GPRS solution features built-in IP Security (IPSec) compliance. IPSec is used to provide Virtual Private Networks (VPN) to tunnel data securely to corporate intranets as well as providing a secure tunnel for operator data such as billing, O&M and signalling traffic.

The Nokia Border Gateway improves security by providing a direct connection to other operators' GPRS networks enabling data to be transferred between networks without using the Internet.

For additional protection against external attack, for example from the Internet, Nokia offers the award winning Nokia IP router platform with integrated CheckPoint Firewall 1™, proven worldwide to provide robust security in service provider networks.

Supporting you every step of the way

To help you take full advantage of the capabilities of GPRS, Nokia provides a range of operator services for planning, building and operating networks, maintaining and optimizing network performance, training operator personnel and integrating solutions that enable new mobile services.

While enabling you to focus on marketing your service launch, Nokia helps you achieve your goals for effective network strategy, rapid rollout and smooth integration of network elements from

different vendors. We also provide support for creating a seamless solution to enable commercially successful services tailored to your specific market.

By identifying areas for improvement, we can help you maintain and enhance network quality and performance. We also work with you to develop an appropriate evolution path, taking into account your growth plan, business strategy and technologies. This expertise, combined with Nokia NetAct, helps raise the quality and efficiency of your operations and achieve a permanent positive impact on your cash flow.

Designed for the best possible performance and highest cost-effectiveness, the Nokia GPRS solution helps you bring value-added mobile services to the market faster, giving you a rapid return on your investment.

Nokia GPRS architecture
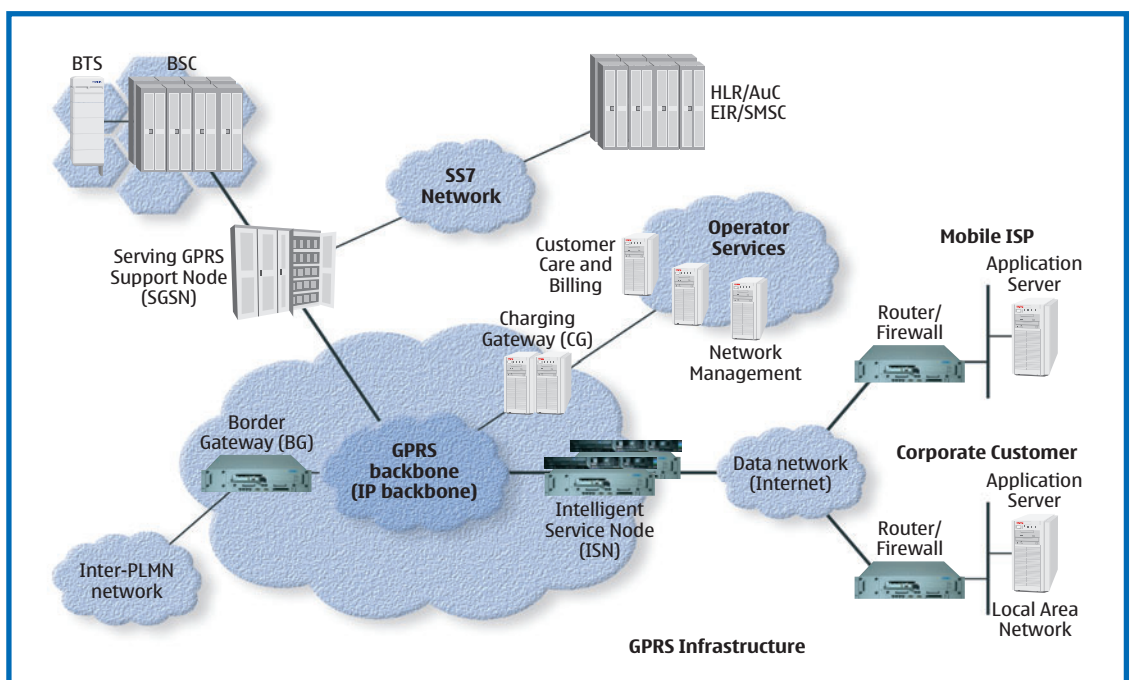
**Nokia end-to-end secure
GPRS solution:**

• All-in-one solution means maximum efficiency
• Ideal platform for value-added data services
• Low-cost solution for radio network upgrade
• Convergence of proven GSM and IP technologies
• Optimised system for reliable performance
• Secure access to Internet and intranet
• One-click access to all services
• Supports new charging methods for value-added
  services
• Comprehensive support for planning, building
  and managing the data network

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