Multimedia Messaging Center (MMSC)

Technology Overview

MMS is an evolution of SMS technology which has proven to be a great success worldwide. It is expected to bring the same benefits in 2,5-and 3-rd generation networks as SMS brought in 2-nd generation networks.

MMS technology allows not only text messages, but also graphics, facsimiles and/or audio information, to be transmitted over mobile networks. The MMS message can be simply a text file with attachments, or photo, audio and text components can be synchronously replayed to create a multimedia presentation. Video clip formats are also supported in MMSC PROTEI. Mobile phones, PDA and PCs can all be used in MMS message exchange.

Subscribers of mobile networks that support MMS services can order multimedia resources from content providers. Content providers' applications need to be connected to a Multimedia Messaging Service Center (MMSC).

MMS technology is independent of the bearer transport. MMS messages can be transferred over existing GSM networks (over WAP), over GPRS networks, and later over 3-rd generation networks (WCDMA).

There are no strict restrictions in MMS specifications on the data types used in MMS messages. However, there are several recommended formats. Among others there are: US-ASCII for text information, JPEG and GIF for graphics, MPEG 4 for video, MP3, MIDI and WAV for audio and ARM for speech encoding.

MMS messages can also be sent to the subscribers whose mobile phones do not support MMS. SMS notification of a received multimedia message with HTTP or a WAP link can be sent to such phones, and they can view their message on the specified Internet page.

Today more than 5 million subscribers worldwide use MMS, and the number of phones manufactured with MMS support has exceeded 90 % of all the phones in production. Operators who offer their subscribers MMS maintain a firm competitive standing in the telecommunications market.

Operator Benefits

- Effective use of GPRS and 3G technology for increasing data traffic in advanced networks and providing new and profitable services;
- Provide subscribers on-demand or subscription-based multimedia news, weather forecast and sports reports. For example, sport events can be broadcast using MMS by sending photo and video clips with the most interesting moments;
- Offer new types of services using MMS: interactive Internet videogames, an option to decorate plain text messages with sound effects or animation, sending MMS greeting cards and much more;
- Encourage subscribers to use information and entertainment multimedia services, data storage services and other Value-added services (VAS) related to the sale of MMS content – both the operator's own content and that received from content providers;
- MMS for advertising;
- Encourage subscribers to use MMS services by organizing various marketing programs. For example, reduce outgoing message cost by including some advertising information in the message body, so a part of the cost is paid by the advertiser.

MMSC in Operation

PROTEI MMSC enables GSM operators to provide their customers with a whole range of multimedia messaging between subscribers' mobile phones, and also between mobile phones and computers. Also using MMSC subscribers can order multimedia resources from content providers. PROTEI MMSC allows external WAP gateways to be used, supports a wide range of standard interfaces and provides an open interface to external content conversion systems and profile management systems. Embedded push-proxy gateway allows easy interconnection with third-party SMSCs.

MMS messages sent from a mobile terminal arrive at the operator's MMSC through the WAP gate. The recipient phone's capabilities are defined based on information from an MMS center subscriber profile handling subsystem.

If the recipient's mobile phone supports MMS technology, the MMSC sends a special short message (WAP-push) through the operator's SMSC, containing the WAP-link to the address where MMS message is stored. After receiving the WAP-push message the recipient's mobile phone sends a request for message receipt and the MMSC delivers MMS message to the addressee.

PROTEI MMSC also provides MMS messaging to phones which do not support MMS. In this case the MMS center saves the message as a web page and sends an SMS message to the recipient's phone with the http address where the message can be viewed on the Internet.

PROTEI MMSC supports a range of additional features that increase system functionality and ease of use:

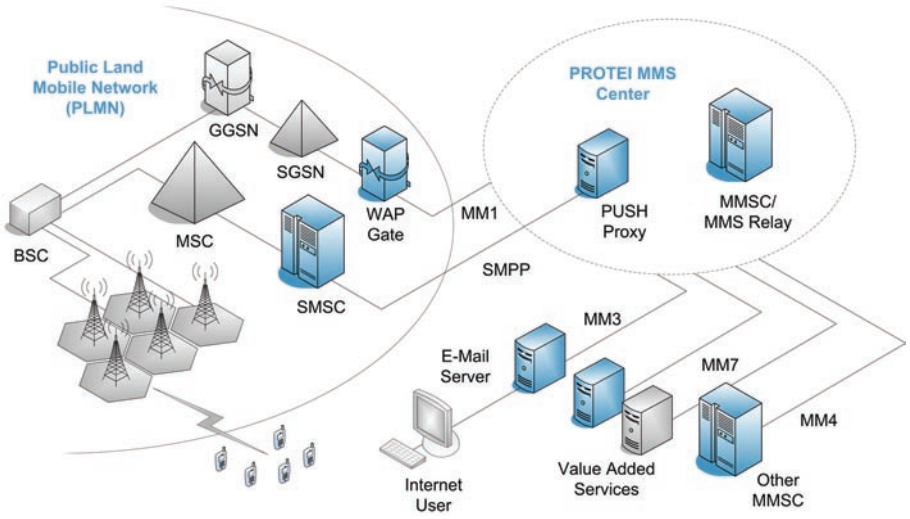
- powerful profile management tools contain subscribers' profiles that are automatically corrected on the basis of MMS messages transfer information. A profile can include information about terminal features and class of service (maximum message size, service ability, etc.); the attribute of MMS service ability activates by default after the first message has been sent successfully from the subscriber`s terminal;
- open interface for integration with external content adaptation system for message conversion into format suitable for recepient terminal;

- MMS interception function allows MMS traffic to be distributed between several MMSCs using a number of routing criteria for load balancing without the need to change WAP gateway settings in subscriber terminals (e.g. one part of MMS traffic can be processed by PROTEI MMSC while another part of the traffic remains at the main operator's MMSC) so PROTEI MMSC can efficiently be used for offloading of the operator's main MMSC;
- message forwarding service: the subscriber can order MMS forwarding to another terminal or to an e-mail address;
- interface with external e-mail server (SMTP-gate)

System Features

- **Message receipt.** MMSC PROTEI can receive messages from mobile phones, by e-mail and from web page;
- **Message delivery.** Messages can be delivered to mobile phones, e-mail addresses or to web pages;
- **Storage and postponed message delivery.** The received message is stored in the system's database until it is delivered to recipient, removed by system's administrator or until its storage time limit runs out. The MMS delivery scheme is defined in the same way as for SMS service. Repeated attempts to deliver messages are made according to a predefined delivery scheme. The delivery scheme can depend on the error which arose on the first sending attempt (i.e. the error which appeared on delivery of the WAP-push message, or on error in MMS message loading process);
- **Delivery report.** Similarly to SMS service, a sender can order a delivery report so as to receive information about message delivery results. MMS users can turn delivery notifications on and off;

PROTEI MMSC Architecture



- **Message storage on web page.** If the recipient's phone does not support MMS technology the message will be saved as web page, and the subscriber will be sent an SMS message with the http address of that page;
- **Message forwarding.** The subscriber can request MMS message forwarding to another terminal or to an e-mail address;
- **Alias service.** The subscriber can order a alias service, which will provide him with a number different to his user number (generally with fewer digits) or a nick name. Short numbers can be used for ease of message sending, or for hiding his user number from other MMS users;
- **Anonymous address service.** If the subscriber orders this option the recipient will not see his number;
- **Multiple recipients.** Several recipient addresses and addresses for transfer of copies can be specified;
- **Mailing lists.** The message is automatically delivered to all subscribers included in the mailing list;
- **Working in different numbering plans.** The system supports both E.164 and e-mail addressing plans;
- **Web administration tools.** The system supports a convenient web-based administration kit for configuration management, statistics analysis and CDR viewing;
- **Wide range of standard inerfaces:**
- MM1 for WAP-gate connections;
- SMPP v3.4 for SMSC connection;
- MM7 for application connection;
- MM4 for connection to another MMSC
- SMTP for connection to external e-mail servers.

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