Multimedia Messaging Service

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With the quick development of China´s mobile communication industry and the fiercer competition in China´s communication market, traditional voice services make a less and less contribution to mobile operators´ revenues. Mobile operators are facing a serious problem of "rise in number and stagnancy in income", that is to say, though the number of subscribers is still growing, the growth rate has slowed down. At the same time, the expenditure of new subscribers keeps decreasing, and ARPU keeps going down. Fortunately, the quick development of the Short Message Service (SMS) in last two years has brought new profits to China Mobile operators, and widened the development space for new services as well. With the advent of 3G age, there is no doubt that the Multimedia Messaging Service (MMS) will be a new business growth point for mobile operators, and be an effective method to stimulate more users to use mobile services and ultimately improve the value of ARPU.

1 Introduction

The most significant characteristic of MMS is to support multimedia contents. It can send not only texts, but also images, videos and audios. Therefore, MMS applications are much richer than those of SMS. MMS supports JPEG and GIF image formats.

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Common users can use MMS to send and receive pictures, while commercial users set up mobile offices with it. People can use MMS to customize real-time information in both descriptive texts and visual images. As for entertainment, flash works, games and movies will certainly become main MMS applications. In addition, MMS also provides email, commercial and positioning services. These are far beyond what SMS can provide.

Attractive MMS applications are based on advanced technologies. First, MMS is supported by the Wireless Application Protocol (WAP). WAP is an open protocol for communications between digital mobile phones, the Internet, Personal Digital Assistants (PDA) and computer applications. With the WAP technology, Internet information and services can be introduced into the mobile phone. MMS is an upper-layer application program over the WAP system. Second, MMS is based on the General Packet Radio Service (GPRS). GPRS is an efficient way of data transmission based on packet switch. It improves GSM circuit data services in transmission rate and data traffic, promotes the development and popularization of WAP services and lays a foundation for MMS development. As a 3G service, the MMS will be a key mobile value-added service.

Currently, there are 6 typical modes to send MMS messages [1, 2]:

(1) Sending messages to an MMS mobile phone via an MMS mobile phone

MMS messages can be sent via an MMS mobile phone to another MMS mobile phone in the same way as SMS messages, except that MMS messages include multimedia contents.

(2) Sending messages to a non-MMS mobile phone via an MMS mobile phone

Since the non-MMS mobile phone can´t receive multimedia messages, the MMS system automatically forwards the messages to the receiver

´s corresponding email box and then sends a notification to his mobile phone.

(3) Sending messages to any email boxes via an MMS mobile phone

Multimedia messages can be sent via an MMS mobile phone to an email box, and the receiver logs on to the email box to read the messages. However, most email boxes don´t support multimedia messages yet.

(4) Sending messages to a MMS mobile phone via an email box

A user logs on to his email box, selects multimedia messages to sent, inputs a receiver´s MMS mobile phone number, and sends the messages as an attachment.

(5) Downloading multimedia messages from the Internet to an MMS mobile phone

A user can customize and order multimedia messages on websites that provide MMSs and then send the messages to an MMS mobile phone.

(6) Sending messages from an MMS mobile phone to personal e-albums

A user can send MMS messages to his personal e-album via an MMS mobile phone. He writes MMS messages in the mobile phone, inputs the album website number and then sends the messages.

2 System Architecture

The Multimedia Messaging Service Environment (MMSE) can be set up on the bearer platform of various existing networks to provide MMS applications. However, due to special requirements for transmission bandwidth and mobile terminals, MMS can only make a full play on GPRS or 3G networks and allow users to enjoy benefits from them well.

A complete MMS system is composed of the MMS terminal, Multimedia Messaging Service Center (MMSC), MMS subscriber database and external application server. In addition, WAP gateway

equipment is needed because WAP is the MMS bearer. An MMS mobile phone will automatically pick up multimedia messages from the MMS message center according to the notification sent as a short message.

The MMS system architecture is shown in Figure 1.

MMS terminals, such as MMS handsets, belong to the functional entity at the application layer. They provide basic functions such as message sending, receiving, browsing, adding and deleting as well as necessary management functions such as encryption and decryption.

MMSC is a multimedia message control center, consisting of the MMS server and MMS relay. It is a core part to build MMSE. MMSC provides addressing, storing and forwarding functions. Receiving a message, the MMS server searches for its receiver´s address. If the address is found, the server will immediately send the message out, otherwise it will store the message to send it later. Supported by special protocols, MMSC can forward messages not only to other MMSCs, the Internet and email interfaces, but also to external application servers for extended services.

The user database includes information about a subscriber´s attributes and services ordered, such as his age, address, mobile phone number and VIP status. With such information, operators can get to know about his MMS use status and provide better services. The database is a base for operators to build a relation with subscribers. With it, a subscriber data warehouse can be set up for Online Analytical Processing (OLAP) to find service usage patterns with the support of data mining technologies, which

is extremely important for operators to prolong subscribers´ lifecycle.

As shown in Figure 1, MMSC provides data to the billing system. The external application server implements value-added services. The WAP gateway takes charge of protocol conversion between wireless networks and MMSC.

3 MMS Implementation

MMS, jointly defined by 3GPP and the WAP forum, is a multimedia service developed on the basis of SMS. It supports communication between different networks and terminals. It can be implemented by both WAP-based and IP-based ways [2, 3].

(1) By WAP-based Way

Mobile communication networks and MMSC are connected via the WAP gateway. When a MMS terminal sends an MMS message, WAP protocols encode it and send it to the WAP gateway through mobile communication networks such as GSM, GPRS and 3G networks. The WAP gateway then sends the message to MMSC according to Hypertext Transfer Protocols (HTTP). MMSC finally implements message addressing, storing and forwarding.

(2) By IP-based Way

Here MMS messages sent by an MMS terminal are forwarded to the IP gateway instead of the WAP gateway. Transfer Control Protocols (TCP) are adopted for communications between MMS terminals and the IP gateway. The IP gateway decodes MMS messages and then sends them to MMSC conforming to TCP. The messages are finally processed by MMSC.

At present, MMS is mainly implemented by the WAP-based way for the sake of forward compatibility.

4 Multimedia Messages

4.1 MMS Message Structure

The MMS message has a large application space and diversified service contents. Recommended size for an MMS message is 30 kb. Its transmission unit is the MMS Protocol Data Unit (PDU), which consists of a message head and a message body. The message head indicates the content types of the message body and specifies the content transmission sequence of the message body. The message body consists of various multimedia files that form an MMS message. Each multimedia file includes a file head and a file body. The file head describes the file and the body is the actual file content.

4.2 MMS Message and Multipurpose Internet Mail Extension (MIME)

An MMS message can be transferred to the WAP gateway or directly to email boxes. Therefore, with different transmission purposes, there are Wireless Session Protocol (WSP) messages and HTTP messages produced at MMS PDU. WSP messages follow WAP protocols, while HTTP messages must guarantee the compatibility between MMS and email services. It is obvious that an MMS message includes multiple types of files. Therefore, MIME, a new message packet assembling technology, is adopted in the MMS system.

MIME defines a format used to transfer structural data. Therefore MMS messages can comprise of various files such as voices and animated pictures without any necessity to convert files in different formats into binary or ASCII codes. MIME guarantees both the transmission of WSP messages and compatibility of MMS with email services, which greatly expands MMS applications.

4.3 MMS Message Content Production

In November 1997, World Wide Web Consortium released a standard language for MMS message content production -- the Synchronous Multimedia

Integrated Language (SMIL). SMIL provides many tags for the link of multimedia contents to Web pages. Similar to the Extensible Markup Language (XML), it arranges and controls message contents through a descriptive language. The description of SMIL is located at the start part of a message body, and can be interpreted and implemented by mobile terminals.

In order to facilitate MMS message content production, many mobile phone manufacturers provide simple writing tools, such as MMS Composer offered by SonyEricsson and NDSforMMS by Nokia. In addition, MMS messages production on Websites is very popular. Computer programming knowledge and Web development platforms such as J2EE and ASP are needed for professional MMS message content production.

5 Conclusion

The development of MMS needs more attention from equipment providers, network operators and users. Only in this way can MMS applications be expanded with continuous development of mobile communication and Internet technologies, which will further promote the popularization of MMS message content development. The MMS development will have a significant influence on the development of next generation communication networks.

References

[1] Zhao Xin, Jiang Liang. MMS Development and Application [M]. Beijing: Beijing University of Posts & Telecommunications Press, 2003, 8.
[2] 3GPP TS 23.140. Multimedia Messaging Service (MMS) [S]. 2002, 9.
[3] 3GPP TS 26.140. Multimedia Messaging Service (MMS): Media Formats and Codes [S]. 2002, 6.

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