WIRELESS APPLICATION

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ABSTRACT

This article describes iSMS, a platform that integrates IP networks with the short message service in mobile telephone systems. iSMS provides a generic gateway for creating and hosting wireless data services for mobile stations. Our approach does not require any modification to the mobile telephone system architecture. The iSMS system can be quickly developed and operated by a third party or end user without involvement of mobile equipment manufacturers and telecom operators. The project described in this paper involves designing and developing a wireless application, called SMS-CBS that runs over the terrestrial cellular network and supports several means of content delivery,mainly Bulk Short Message Service (SMS), and Cell Broadcast Service (CBS). Based on the iSMS platform, we illustrate services such as e-mail delivery/forwarding, Web access (e.g., stock and train schedule query) and handset music services. The iSMS platform and the services have been implemented for GSM networks. With iSMS, usersare able to use standard GSM handsets to access wireless Internet services, while other approaches like the Wireless Application Protocol and SIM Toolkit services require function-enabled MSsdelivery /forwarding, Web access (e.g., stock and train schedule query) and handset music services. The iSMS platform and the services have been implemented for GSM networks. With iSMS, users are able to use standard GSM handsets to access wireless Internet services, while other approaches like the Wireless Application Protocol and SIM Toolkit services require function-enabled MSs.

Keyword: Cell Broadcast, bulk SMS, wireless services.

I. INTRODUCTION

During the past 10 years, mobile services have evolved from basic voice communication to mobile-broadband multimedia services. The mobile-broadband applications and services commercially available around the world owe their existence to the evolution of wireless technology advancements of yesterday and today. The technology advancements achieved through airlink-performance enhancements—higher data rates, optimized quality of service (QoS),reduced latency and increased network capacity—have led to new and enhanced service offerings for mobile operators.

Evolution of Wireless

To date, we have experienced four stages in the progression of mobile services, namely simple communication, high-speed downloading, high-speed downloading and uploading, and real-time latency-sensitive services. A fifth stage, seamless fixed-mobile convergence, is about to enter

service. In this section, we will briefly review the evolution of each mobile service, in the order of progression.

 SMS (Short Message Service), commonly referred to as "text messaging," is a service for sending short messages of up to 160 characters (224 characters if using a 5-bit mode) to mobile devices, including cellular phones, smartphones and PDAs.SMS is similar to paging. However, SMS messages do not require the mobile phone to be active and within range and will be held for a number of days until the phone is active and within range. SMS messages are transmitted within the same cell or to anyone with roaming service capability. They can also be sent to digital phones in a number of other ways, including:

1. From one digital phone to another
2. From Web-based applications within a Web browser
3. From instant messaging clients like ICQ
4. From VoIP applications like Skype
5. From some unified communications applications.

Typical uses of SMS include:

1. Notifying a mobile phone owner of a voicemail message
2. Notifying a salesperson of an inquiry and contact to call
3. Notifying a doctor of a patient with an emergency problem
4. Notifying a service person of the time and place of their next call
5. Notifying a driver of the address of the next pickup

Enhanced messaging service (EMS), an adaptation of SMS that allows users to send and receive ringtones and operator logos, as well as combinations of simple media to and from EMS-compliant handsets. Many of these uses depend upon short telephone numbers called common short codes (CSCs), usually consisting of five digits, that are used to address SMS and MMS messages from cellular telephones. In recent years, SMS spam has become an issue for some users a security attack in which the user is tricked into downloading a Trojan horse, virus or other malware onto a cellular phone or other mobile device. Users can send messages from a computer via an SMS gateway. SMS gateways are Web sites that allow users to send messages

to people within the cell served by that gateway. They also serve as international gateways for users with roaming capability.

MMS enhances personal connectivity and productivity through a more immediate exchange of rich content. Construction project, or capture and store a new design concept for later review. Synchronized presentations using the synchronized multimedia integration language (SMIL, an XML-based protocol), MMS enables PowerPoint-style presentations (with integral audio and video) to be created on, and sent from/received by mobile devices. Using a simple media editor, users can incorporate audio and video along with still images and format-ted text in multimedia presentations. Video on the ultimate extension of the MMS digital imaging capabilities will be video content. Users will be able to record a scene using a built-in digital camera and transmit the clip to a recipient (initially, they will be able to exchange 30-second video clips). Streaming media on large video and sound content can be streamed using MMS with-out having to occupy memory in the phone. Although this seems like a contradiction since the basic principle of MMS is to store messages locally in the phone streaming technology is actually well suited for MMS. When the message is viewed in the phone, the content is not stored, but is streamed directly to it Three main specifications have been defined for MMS:

1. 3G TS 23.140 Multimedia Messaging
2. Service defined by the Third-generation
3. Partnership Project (3GPP), this specification defines the overall MMS service, excluding the WAP-related areas (to which it refers)

II. SHORT MESSAGE SERVICES

In the SMS network operated by GSM service providers four layers of transport are used (Figure 1.):

SM-AL(ApplicationLayer)
SM-TL(TransferLayer)   SM-RL(RelayLayer)
SM-LL (Lower Layers)

Ozeki NG - SMS Gateway is located in the SM-AL layer. When sending an SMS message, the software creates protocol data units (PDUs) transported by the SM-TL layer. When a GSM device attached to the PC receives an SMS message, the message is also encoded according to the SM-TL layer PDU specification. Ozeki NG - SMS Gateway decodes this PDU and makes the message readable for computer programs and computer users.
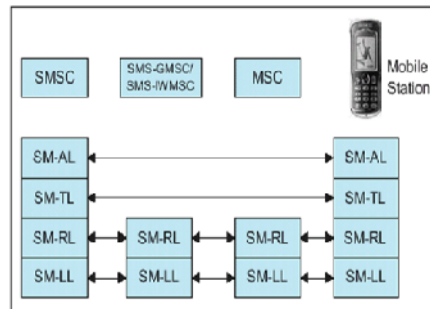

Figure 1 - SMS network layers

To understand how the SMS travels from the mobile phone to the SMSC, look at Figure 2 below. In this figure you can see which protocols are used and which GSM network entities take place in the communication process. As you can see, the mobile phone (Mobile station) transmits the SMS message to the GSM base station (BTS) through a wireless link. Then the message goes though the backbone network of the service provider. The Mobile Switching Center (MSC), the Home Location Register (HLR) and, optionally, the Visitor Location Register (VLR) is used to find out the appropriate Short Message Service Center (SMSC) which will store and forward the message when the receiving party becomes available.
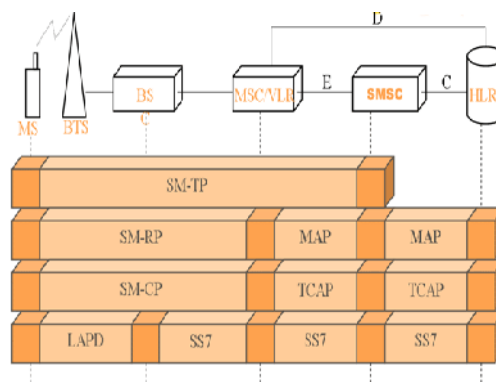

Figure 2 - SMS transportation

III. ENHANCED MESSAGING SERVICES

Enhanced Messaging Service (EMS) is an adaptation of the Short Message Service (SMS) that allows users to send and receive ring tones and operator logos, as well as combinations of simple media to and from EMS-compliant handsets. Because EMS is based on SMS, it can use SMS Centers (SMSCs) the same way that SMS does. EMS works on all Global System for Mobile communications (GSM) networks (widely used in Europe and increasingly available elsewhere). If a message is sent to a phone that is not EMS-capable, the recipient will still receive the text portion of the message.EMS users can integrate text, melodies, pictures, sounds, and animations to enhance the expressive power of messages that are limited by the display constraints of mobile devices. Message senders can use images, sounds, and animation they download from an online library or create images and sounds directly on the phone.
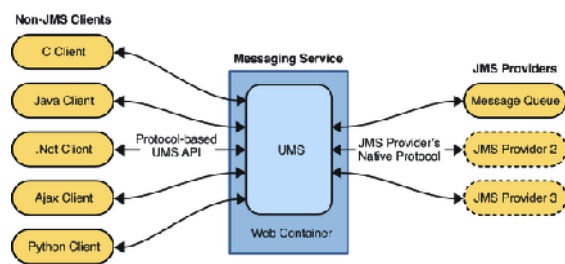

Figure 3: EMS with java messaging services

EMS is an open standard developed by the Third Generation Partnership Project (3GPP), a mobile telecommunications standards collaborative. The standard is considered an intermediate technology between SMS and Multimedia Messaging Service (MMS), with more capabilities than the former, but fewer than the latter technology. EMS is being actively promoted by Alcatel, Ericsson, Motorola, and Siemens. Nokia is promoting a similar proprietary standard called "Smart Messaging."

IV. MULTIMEDIA MESSAGE SERVICES

The Multimedia Messaging Service (MMS), as its name implies, is intended to provide a rich set of content to subscribers in a messaging context. It supports both sending and receiving of such messages by properly enabled client devices. The multimedia messaging service is viewed as a

non-real-time delivery system. This is comparable to many messaging systems in use today. Prime examples include traditional email available on the Internet and wireless messaging systems such as paging or SMS. These services provide a store-and-forward usage paradigm and it is expected that the MMS will be able to interoperate with such systems.Real-time messaging also exists in various forms. For example, instant messaging available from various vendors or various chat services (e.g. text, voice) are becoming popular. Such services are not currently supported with the MMS system but may be considered for future releases. A key feature of MMS is the ability to support messaging activities with other available messaging systems. This is shown in Figure 2 below which shows an abstract view of an MMS network diagram. It is expected that specific MMS networks may have one or more such connections as well as include specific messaging services not directly represented (e.g. fax or voice mail systems).
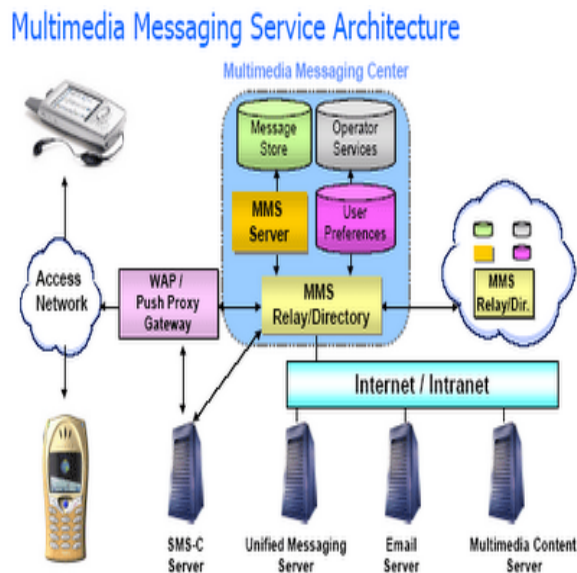

Figure 4: MMS Architecture

V. CONCLUSION

The new MMS standard enhances the SMS mobile messaging experience beyond all recognition, allowing users to add color images, animations, audio samples, and video clips to their personal and business messages. This opens up a significant source of revenue for network operators and content and service providers. Ericsson has already announced an MMS-capable mobile phone, and has developed an MMS solution that enables operators as well as service providers to

smoothly evolve their current SMS business toward mobile multi-media. We have shown that SMS can be successfully used in group discussions, be it in schools or business. It preserves anonymity, which allows people to articulate their views without fear of being criticized and is relatively easy to use. All that is needed is a mobile phone which is SMS capable. There is no need to take minutes as everything is kept in the database and can be retrieved in the same state that is was last viewed, including sticky positions and colors. A possible idea for future research is to use mobile devices to send instant messages which can carry much more information than text messages, but would be free to use except for the price of getting online. If the instant message arrives while the user is not online, it can be stored in a database and when the user logs on, he or she can retrieve their messages, rather like email Building on the success story of SMS, EMS and MMS are enhancing the user's messaging experience significantly. With MMS, communication between individuals will become much more visual, which increases the emotional value of the message and the desire to share it. Like SMS, MMS can become a true mass market service that is used by both private and business customers and it could play a central role in offsetting the trend in declining revenues by driving the move to data services. MMS could become the key business-case driver for GPRS and also a central driver of the 3G business case. If content, interoperability, roaming and pricing issues are resolved, 2003 will be the year in which MMS makes a serious impact.

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