Multimedia Messaging Service

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Presentation overview

- What is MMS?
- History lesson
- MMS tech in brief
- WAP explained
- MMS "on" WAP
- MMS architecture
- MMS media formats and codecs
- MMS in action
What is MMS?

- Multimedia Messaging Service (MMS) is a store and forward messaging service that allows mobile subscribers to exchange multimedia messages with other mobile subscribers.
- Multimedia Messaging Service (MMS) is an important emerging service, which allows the sending of multiple media in a single message, and the ability to send a message to multiple recipients.
- Each Multimedia Message contains a number of pages (think of a PowerPoint slide show as an analogy). On each page, there can be one image and one set of text. An audio file can also be attached. The time that each “page” is displayed can be specified, so the user experience is somewhat like a slide show.
- An example of how to transfer a Multimedia Message:
  - Using an MMS compatible phone, take a photo
  - Use your phone to personalise the message by adding text, sound clip or your own voice.
  - Send the MMS message.
- On an compatible phone, the MMS message will appear with a new message alert. The picture message will open on the screen, the text will appear below the image and the sound will begin to play automatically.
- If the message is sent to a non-compatible MMS phone the user will receive a SMS message along the lines of: “You have been sent a picture message!”

History lesson

![History of Technology Diagram]
History lesson

- **SMS**
  - Introduced in 2G networks
  - New attractive services: Entertainment, information etc...
  - First touch to visual messaging.

- **WAP**
  - Introduced in 1999 as an enabler of mobile internet
  - GPRS can allow commercial breakthrough of WAP

- **WTA**
  - Wireless Telephonic Application
  - Part of the WAP standard (WAP 2.0)
  - Extends the functionality of WAP

- **MMS**
  - Was introduced using GPRS technology (2.5G)
  - First digital images, later with UMTS -> video clips
  - Even though possible with GPRS
  - MMS “krever” WAP 1.2.1

MMS tech in brief

- The MMS Client interacts with the MMS Proxy - Relay. This operation is consistent with the WAP model where the MMS Proxy - Relay operates as an Origin Server (Pull Operations) or as a Push Initiator (Push Operations).

- The MMS Proxy - Relay is the network entity that interacts with the user mailbox and is responsible for initiating the notification process to the MMS Client. The WAP Gateway provides standard WAP services needed to implement MMS, these include: HTTP methods; PUSH services; OTA security; and Capability Negotiations (UAProf).
MMS tech in brief

- The “Payload” in from the last figure is actually an MMS application specific packets holding the following structure:

<table>
<thead>
<tr>
<th>MMS headers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
</tr>
<tr>
<td>Message Body</td>
</tr>
<tr>
<td>presentation</td>
</tr>
<tr>
<td>image/jpeg</td>
</tr>
<tr>
<td>text/plain</td>
</tr>
<tr>
<td>audio/wav</td>
</tr>
</tbody>
</table>

WAP Explained

- WAP – Wireless Application Protocol
- The objective of WAP is to bring a standardized application protocol for wireless us, to a wide spread of devices
  - Cellular phones
  - PDA
  - Etc.
WAP Explained

- Wap content and applications are specified in a set of well-known content formats based on the familiar WWW content formats

- Wap utilizes proxy technology to optimize and enhance the connection between the wireless domain and the WWW
  - The Wap proxy may provide a variety of functions, including:
    - Protocol gateway
    - Content encoders and decoders
    - Caching proxy
WAP Explained

Application Framework
- Multimedia Messaging
- Content Formats

Protocol Framework
- Session services
- Transfer Service
- Transport Service
- Bearer Networks

MMS “on” WAP
MMS “on” WAP

- The application framework is a general purpose environment
- WAP mobiles/devices that are MMS-enabled will have the "Multimedia Messaging" application protocol/system integrated into the application framework
- If a non-MMS-enabled device/mobile has been sent a MMS message, it will receive notification about it by the means of an SMS message.
- Next we will describe the overall architecture of MMS with a presentation of all units working together to form a total MM service.

MMS architecture
MMS media formats and codecs

Text
Plain text. Any character encoding (charset) that contains a subset of the logical characters in Unicode shall be used (e.g. US-ASCII, ISO-8859-1, UTF-8, Shift_JIS, etc.). Unrecognized subtypes of "text" shall be treated as subtype "plain" as long as the MIME implementation knows how to handle the charset. Any other unrecognized subtype and unrecognized charset shall be treated as "application/octet-stream".

MMS media formats and codecs

Speech
The AMR codec shall be supported for narrow-band speech.
The AMR wideband speech codec shall be supported when wideband speech working at 16 kHz sampling frequency is supported.

<table>
<thead>
<tr>
<th>Codec mode</th>
<th>Source codec bit rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMR_12.20</td>
<td>12.20 kbps (GSM-06.68)</td>
</tr>
<tr>
<td>AMR_16.20</td>
<td>16.00 kbps</td>
</tr>
<tr>
<td>AMR_7.95</td>
<td>7.95 kbps</td>
</tr>
<tr>
<td>AMR_7.40</td>
<td>7.40 kbps</td>
</tr>
<tr>
<td>AMR_5.70</td>
<td>6.70 kbps</td>
</tr>
<tr>
<td>AMR_5.90</td>
<td>5.99 kbps</td>
</tr>
<tr>
<td>AMR_5.15</td>
<td>5.15 kbps</td>
</tr>
<tr>
<td>AMR_4.75</td>
<td>4.75 kbps</td>
</tr>
<tr>
<td>AMR_3.80</td>
<td>3.80 kbps (see note 1)</td>
</tr>
</tbody>
</table>
MMS media formats and codecs

Audio
MPEG-4 AAC Low Complexity object type should be supported. The maximum sampling rate to be supported by the decoder is 48 kHz. The channel configurations to be supported are mono (1/0) and stereo (2/0). In addition, the MPEG-4 AAC Long Term Prediction object type may be supported.

Synthetic audio
The Scalable Polyphony MIDI (SP-MIDI) content format defined in Scalable Polyphony MIDI Specification and the device requirements defined in Scalable Polyphony MIDI Device 5-to-24 Note Profile for 3GPP should be supported. SP-MIDI content is delivered in the structure specified in Standard MIDI Files 1.0, either in format 0 or format 1.

Still Image
ISO/IEC JPEG together with JFIF shall be supported. The support for ISO/IEC JPEG only apply to the following two modes:
- mandatory: baseline DCT, non-differential, Huffman coding
- optional: progressive DCT, non-differential, Huffman coding

Bitmap graphics
The following bitmap graphics formats should be supported:
- GIF87a
- GIF89a
- PNG
MMS media formats and codecs

Video
For terminals supporting media type video, ITU-T Recommendation H.263 profile 0 level 10 shall be supported. This is the mandatory video codec for the MMS. In addition, MMS should support:
- H.263 Profile 3 Level 10
- MPEG-4 Visual Simple Profile Level 0

Vector graphics
For terminals supporting media type "2D vector graphics" the "Tiny" profile of the Scalable Vector Graphics (SVG- Tiny) format shall be supported, and the "Basic" profile of the Scalable Vector Graphics (SVG-Basic) format may be supported.
MMS in action

- Example scenario
  - Send pictures between cell phones