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Technical Specification

**3rd Generation Partnership Project;
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IP Multimedia Subsystem (IMS) messaging;
Stage 1
(Release 11)**

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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x   the first digit:

   1   presented to TSG for information;

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   3   or greater indicates TSG approved document under change control.

y   the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

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Introduction

In today's world there are many different types of messaging services available both in the wired and wireless worlds. Some messaging services are supported in both environments; others are only to be found in one. The expectations of the services differ in that some are designed to be used in what is perceived as 'real' time, whereas others are designed as a 'mailbox' service where the message is stored ready for collection or delivery at a later stage.

The 3GPP Technical Report TR22.940 identifies the issues and needs surrounding messaging solutions related to the 3GPP IP Multimedia Subsystem (IMS) taking into consideration use cases that illustrate the needs of both service providers and users. This Technical Specification takes the Technical Report into account when defining the requirements for the support of IMS Messaging.

IMS Messaging services incorporates one or more of the following messaging types Immediate messaging and Session based messaging. With Immediate messaging the sender expects immediate message delivery in what is perceived as real time. With Session based messaging a communications association is established between two or more users before communication can take place. In the simplest form Session based messaging maybe a direct communication between two users. This specification defines the requirements for both the Immediate message type and the Session based message type.

The specification provides the ability to develop interoperable messaging services that use Immediate and/or Session based message types.

1 Scope

The present document specifies the stage one description of the IMS Messaging services. Stage one is an overall service description and defines service requirements, primarily from the subscriber's and service providers' points of view, and does not deal with the details of the human interface itself.

The present TS includes information applicable to network operators, service providers and terminal, switch and database manufacturers.

The present TS contains the requirements for IMS Messaging services, which are sufficient to provide a complete service. The messaging types identified in this document are: immediate messaging and session based messaging.

It is highly desirable that technical solutions for IMS Messaging services should be sufficiently flexible to allow for possible enhancements. Additional functionalities not documented in this 3GPP TS may implement requirements which are considered outside the scope of this 3GPP TS. Such additional functionality shall not compromise conformance to the core requirements of the service.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   Void

[2]   3GPP TS 22.250: 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Stage 1, IMS Group Management

[3]   RFC 2486: "The Network Access Identifier"

[4]   3GPP TS 21.133; 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3G Security; Security Threats and Requirements

[5]   3GPP TS 26.140; 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Multimedia Messaging Service (MMS); Media formats and codecs

[6]   3GPP TS 26.234: "End-to-end transparent streaming Service (PSS); Protocols and Codecs".

[7]   3GPP TS 22.228; 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Service requirements for the Internet Protocol (IP) multimedia core network subsystem; Stage 1

[8]   3GPP TS 26.244: "Transparent end-to-end packet switched streaming service (PSS); 3GPP file format (3GP)";

[9]   3GPP TS 26.245: "Transparent end-to-end packet switched streaming service (PSS); Timed text format".

3 Definitions, symbols and abbreviations

3.1 Definitions

Immediate messaging: A type of IMS Messaging service by which the sender expects immediate message delivery in (near) real time fashion

IMS Messaging services: A group of services, supported by capabilities of the 3GPP IP Multimedia Subsystem 3GPP TS 22.228 [7], that allows an IMS user to send and receive messages to other users. IMS messaging services comprise of one or more types: Immediate messaging and Session based messaging.

Session based messaging: A type of IMS Messaging service by which the sender expects immediate message delivery in (near) real time fashion . In addition the sender(s) and the receiver(s) have to join to a messaging session e.g. chat room, before message exchange can take place

3.2 Abbreviations

IP   Internet Protocol
IMS   IP Multimedia Subsystem
OMA   Open Mobile Alliance

4 Informative description of messaging services in the IMS

As 3GPP has developed the concept of IMS it is thought useful to consider how a SIP based IP network can be utilised to provide messaging capabilities. One of the chief characteristics of SIP is its ability to rapidly and efficiently create real-time sessions between groups of users. It therefore appears that SIP based messaging would be a potential candidate to provide the equivalent of "Chat Room" and "Instant Messaging" (IM) type services found on the Internet today. Typical characteristics instant messaging are instant delivery of the messages to the targeted recipient(s) and interaction with presence information where users are able to see who is on-line as well as their status.

A chat room is a "place" where multiple persons can join, follow and contribute to the ongoing discussion and leave the "room" at any time. Chat rooms are more permanent in nature when compared to IM exchanges and may be created by users or service providers. Additionally, chat rooms can be further divided to the private and public chat rooms. Normally, users who are participating in chat room will receive all the messages that are sent by the other participants. Similarly, the users are also able to send private messages to the chat room or even privately to some participant.

Unfortunately, the most popular internet based instant messaging services are usually based upon closed and proprietary protocols which has made it impossible for different service providers to allow interoperable messaging between their respective users. Additionally, internet based services do not take into consideration the wireless environment and the needs of operators to provide services that are commercially viable by for example, providing support for charging. This technical specification will further elaborate the essential messaging characteristic of these services and state how they may be enhanced, e.g. operators may be able to create and then advertise chat rooms containing specific content where users who join the room may be charged an 'entrance' fee,
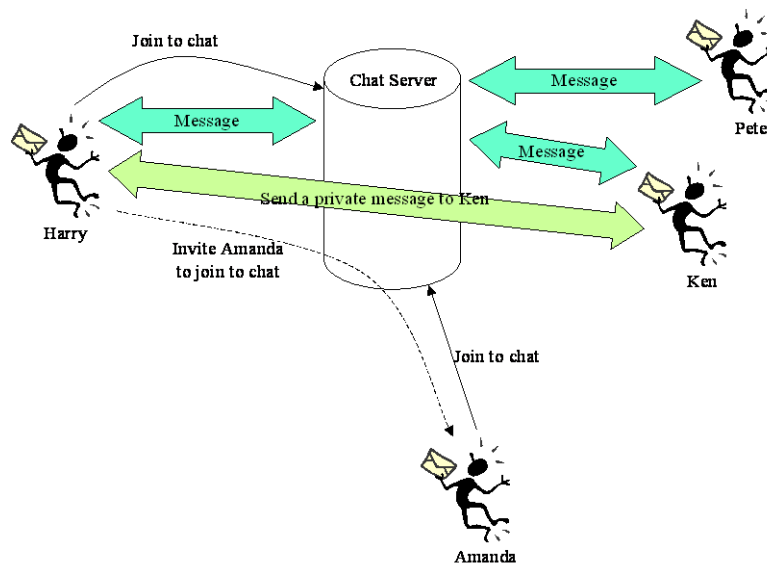

Figure 1. Example IMS Messaging service: Chat room

5 Informative description of messaging types

Messaging can be divided to two different main classes based on the expectation of the sender. The sender either expects the message to be delivered immediately or he does not care so much whether the message is delivered immediately or later.

The immediate case can be further divided to two different sub-classes based on the actions required form the user before he can engage in a communication. The user can both send and receive messages without any prior actions or he may be required to join to a messaging session before the message exchange can take place.

The messaging types considered in this specification are

- **Immediate messaging**:

    Typically, sender is aware of the availability of the recipient(s) (possibly through the use of the Presence service) before sending this type of message as, if the recipient is not available, the message may be discarded or deferred. An immediate message may be deferred by the recipient's network based on the message filtering settings defined by the recipient or by the recipient's IMS service provider.

- **Session based messaging**:

    The sender and recipient expect near real time message delivery. Typically, recipients of the session based messaging that are not joined to a group or are not available will not receive the messages. Typically, a sender may send a message to all participants in the messaging session without addressing them individually.

6 Immediate messaging requirements

6.1 General requirements

Network operators have different network configuration and commercial requirements. IMS Messaging shall be supported in a manner that meets the operator's IMS requirements. Thus, an identified set of functionalities and formats shall be standardized to ensure interoperability across networks and terminals to support IMS Messaging.

The following general requirements shall be supported by Immediate messaging.

a) It shall be possible for the UE and the network to differentiate between immediate messages from other messaging types.

b) Within the capabilities of networks and terminals, the user shall have a consistent experience regardless of the access network e.g. 3GPP systems, fixed networks, the Internet.

c) Immediate messaging shall support a minimum set of functionality for message delivery, management and filtering to ensure interoperability between different terminals and networks.

d) Immediate messaging shall be able to support the ability of the recipient's network to take into account the recipient's terminal capabilities. In addition, the originating network/terminal may also be able to take into account recipient's terminal capabilities. Specifically the recipient's terminal capabilities that may be taken into account at a minimum include:

    1) Display capabilities (including screen size, number of colours, number of lines of text, etc);

    2) Media content types supported (Audio, Video etc);

    3) Media content formats supported (JPEG, GIF, etc);

    4) Media Storage capacity;

    5) Encryption/Security mechanisms supported

    The capabilities of the user's terminal may be reflected in the message filtering and corresponding actions as identified in clause 6.7.

e) Immediate messaging should be able to take into account the availability and changes of the state of availability of the terminal. Immediate messaging shall be able to make use of the Presence Service, if provided by the network.

f) It shall be possible to store in the ISIM a number of sets of configuration information to allow access to Immediate messaging services. One of these sets of configuration information is preset by the issuer of the ISIM. Such preset configuration information set shall only be configurable by issuer of the ISIM. The preset configuration information is selected unless otherwise specified by the user. It shall be possible to retain the configuration information when the UICC is used in different terminals.

g) It shall be possible to send and receive immediate messages without prior establishing a messaging session.

h) It shall be possible for the network operator providing the Immediate messaging service to choose, wherever possible, the most suitable transport mechanism for carrying messages (e.g. signalling network, dedicated PDP context, other access technologies and so on…) both for UE originated and UE terminated messages.

i) It shall be possible for the network operator providing the Immediate messaging service to choose, wherever possible, the parameters used (i.e. QoS) both for UE originated and UE terminated messages.

6.2 Message content requirements

Following requirements are specific to content delivered with immediate messaging.

a) Content size shall not be limited by technology.

b) It shall be possible to carry different media including text, images, video and audio within a single message. Media types shall be MIME encoded.

c) Immediate messaging shall provide a minimum set of supported formats to ensure full interoperability between different terminals and networks (e.g. JPEG for pictures, AMR for speech, H.263 for video). The minimum set of supported formats shall be common to all IMS Messaging types. The minimum set of supported formats should be aligned with formats used in other 3GPP-defined services 3GPP TS 26.140 [5], 3GPP TS 26.234 [6].

d) Content formats shall be defined so that interworking with 3GPP and Internet messaging solutions is facilitated.

e) It shall be possible to compose message of either a single medium (e.g. voice) or multi-media (e.g. voice and video). The IMS Messaging service shall be able to support a request for media sequencing.

6.3 Management requirements

The following management requirements shall be supported.

a) The IMS service provider shall be able to enable/disable message delivery and submission.

b) Immediate messaging shall be able to support a request from the user to enable/disable message delivery.

c) Immediate messaging shall be able to support the user to manage his user service profile related to Immediate messaging (e.g. customize his messaging environment within the capabilities of the terminal, network and messaging application). This could be unconditional or conditional e.g. depending on roaming conditions or operator restrictions.

d) Immediate messaging shall allow an IMS service provider to configure Immediate messaging environment e.g. in such a way that submitted and/or incoming Immediate messages of a particular user are stored in a network based repository.

6.4 Message delivery requirements

Following requirements define the message delivery.

a) Message delivery shall be immediate i.e. messages are transported by the IMS system to the recipient's terminal (without notifications) subject to message filtering settings defined by the recipient or by the recipient's IMS service provider.

b) Messages shall not be stored by the network. If supported by the recipient's network as an application option messages may be stored in the recipients network.

c) It shall be possible for the sender to receive delivery acknowledgements (success/failure) for sent messages.

6.5 Storage requirements

The following storage requirements shall be supported.

a) It shall be possible for a sender to request to persistently store a sent Immediate message in a network based repository at the time of sending if the IMS service provider provides such application level service.

b) Immediate messaging shall be able to support a request from a user to retrieve messages that are stored in a network based repository.

c) Immediate messaging shall be able to support a request from a user to delete messages that are stored in a network based repository.

d) Immediate messaging shall be able to support a request from a user to forward one or more messages that are stored in a network based repository to another destination.

e) Immediate messaging shall be able to support a request from a user to view the list of messages and message related attributes, such as sender, recipient, subject and date/time, in a network based repository.

f) Immediate messaging shall be able to support a request from a user to upload one or more Immediate messages into a network based repository for persistent storage.

6.6 User privacy requirements

Following requirements define user privacy.

a) It shall be possible for the recipient to see the public ID of the sender of the message unless the sender has requested to hide it.

b) It shall be possible for the sender of the message to request to hide its public ID from the recipient (anonymous sender).
The sender's public ID shall not be delivered to the recipient. The capability of public ID hiding is an IMS service provider and legislation issue and it may or may not be available. If the service is not available the message shall not be delivered to the recipient.

6.7 Message Filtering

It shall be possible for a subscriber to set up, modify, and delete filters in the network of the subscriber's IMS service provider, in order to control the treatment of a message by the network when an immediate message is received when the subscriber is either unavailable or when the subscriber does not currently want to receive messages. The filters shall also support the ability of the subscriber to specify the maximum size and type of message content etc that they are or are not willing to accept. The filters shall also support the ability of the subscriber to block (and unblock) messages from specific senders or anonymous senders.

Following specific requirements define the message filtering capabilities of the recipient.

a) It shall be possible to define specific message treatment based on following criteria

  1) sender address (including anonymous senders);

  2) message size;

  3) message class (e.g. advertisement, private….);

  4) message priority;

  5) message content type (e.g. video, audio….);

6) message content format (e.g. mpeg, jpeg….);

7) message type (e.g. immediate message);

8) message subject;

9) availability of the recipient; and

10) additional criteria maybe possible but are outside the scope of this document..

b) It shall be possible to specify the following message treatments in a filter:

1) Block the delivery of the message content.

2) Store the message content and notify recipient.

3) Store the message content for a specific time or until the recipient requests delivery.

4) Store and push the message content to recipient when available.

5) Redirect the message to another address.

6) Additional treatments maybe possible but are outside the scope of this document.

The IMS service provider shall also be able to set and control the filter settings either on behalf of the subscriber or based on policy.

7 Session based messaging requirements

7.1 General requirements

Network operators have different network configuration and commercial requirements. IMS Messaging shall be supported in a manner that meets the operator's IMS requirements. Thus, an identified set of functionalities and formats shall be standardized to ensure interoperability across networks and terminals to support IMS Messaging.

The following general requirements shall be supported.

a) There shall be a mechanism to differentiate session based messages from other messaging types.

b) Within the capabilities of networks and terminals, the user shall have a consistent experience regardless of the access network e.g. 3GPP systems, fixed networks, the Internet.

c) Session based messaging shall support a minimum set of functionality to ensure interoperability between different terminals and networks.

d) Session based messaging shall be able to take into account the capabilities of the terminals participating in the messaging session. Specifically the terminal capabilities that may be taken into account at a minimum include:

1) Display capabilities (including screen size, number of colours, number of lines of text, etc);

2) Media content types supported (Audio, Video etc);

3) Media content formats supported (JPEG, GIF, etc);

4) Media Storage capacity;

5) Encryption/Security mechanisms supported

The capabilities of the user's terminal may be reflected in the message filtering and corresponding actions as identified in clause 7.7.

e) It shall be possible to store in the ISIM a number of sets of configuration information to allow access to IMS Messaging services. One of these sets of configuration information is preset by the issuer of the ISIM. Such preset configuration information set shall only be configurable by issuer of the ISIM. The preset configuration

information is selected unless otherwise specified by the user. It shall be possible to retain the configuration information when the UICC is used in different terminals.

f) It shall be possible for the subscribers to join to a session e.g. chat room.

g) It shall be possible for the subscribers to leave a session e.g. chat room.

h) It shall be possible to send a message to all the participants of a messaging session without specifying the individual participant's addresses or using a message delivery list.

i) It shall be possible to invite new participants to the existing messaging session.

1) The invitations shall be semi permanent i.e. it is not required that invitee will act immediately.

2) It shall be possible to cancel the invitation by the inviter.

3) It shall be possible for the inviter to define the validity period of the invitation.

4) It shall be possible for the invitee to see the originator of the invitation unless the inviter has required hiding his public ID.

5) It shall be possible for the inviter to define the messaging session to which the invitation is made.

6) It shall be possible for the invitee to identify the messaging session to which he was invited.

j) It shall be possible for the recipient of the message to identify from which messaging session the message came from (for both public and private messages).

k) It shall be possible for the recipient to identify the sender (unless the sender has required hiding its public ID) of the message in addition to the messaging session from which the message came from.

l) It shall be possible for the sender to send a private message for a selected recipient.

m) It shall be possible for the recipient to determine if the message was send as a private message within a messaging session.

n) It shall be possible for the subscriber to request the message session properties e.g. list of active members.

o) It shall be possible for the subscriber to automatically receive updates containing the changes in message session properties e.g. change in the list of active members.

p) It shall be possible to utilize IMS Group Management 3GPP TS 22.250 [2] as appropriate.

q) It shall be possible for a subscriber in an IMS Messaging session to request and to receive an indication of when user is entering a message ("Is typing"). This request may apply to a specific user or users in the same session. Subject to privacy requirements, the corresponding indications will identify the persons who are entering a message.

r) It shall be possible for the network operator providing the IMS Messaging service to choose, wherever possible, the most suitable transport mechanism for carrying messages (e.g. signalling network, dedicated PDP context, other access technologies and so on…)

s) It shall be possible for the network operator providing the IMS Messaging service to choose, wherever possible, the parameters used (i.e. QoS)

t) The operator shall be able to enforce the use of the preferred transport mechanism and parameters both for UE originated and UE terminated messages.

7.2 Message content requirements

Following requirements are specific to content delivered with session based messaging.

a) Content size shall not be limited by technology.

b) It shall be possible to carry different media including text, images, video and audio. Media types shall be MIME encoded.

c) Session based messaging shall provide a minimum set of supported formats to ensure full interoperability between different terminals and networks (e.g. JPEG for pictures, AMR for speech, H.263 for video). The minimum set of supported formats shall be common to all IMS Messaging types. The minimum set of supported formats should be aligned with formats used in other 3GPP-defined services 3GPP TS 26.140 [5], 3GPP TS 26.234 [6].

d) Content formats shall be defined so that they enable interworking with 3GPP and Internet messaging solutions.

e) It shall be possible to compose message of either a single medium (e.g. voice) or multi-media (e.g. voice and video). The IMS Messaging service shall be able to support a request for media sequencing.

7.3   Management requirements

The following management requirements shall be supported.

a) IMS Messaging shall be able to support a request from the IMS service provider to enable/disable message delivery and submission.

b) IMS Messaging shall be able to support a request from the user to enable/disable message delivery and submission.

c) IMS Messaging shall be able to support the user to manage his user service profile related to IMS Messaging (e.g. customize his messaging environment within the capabilities of the terminal, network and messaging application). This could be unconditional or conditional e.g. depending on roaming conditions or operator restrictions.

d) It shall be possible for IMS service provider to configure messaging session environment e.g. in such a way that all incoming IMS Messages are stored in a network based repository.

e) It shall be possible for an authorized user or an IMS service provider enable session based messaging (e.g. create chat room) and thus become an administrator of messaging session.

f) It shall be possible for the administrator of a messaging session to control who is allowed to participate in the messaging session.

g) It shall be possible for the IMS service provider or administrator of a messaging session to disable messaging session (e.g. close a chat room).

h) It shall be possible for the administrator of the messaging session (to set properties related to the messaging session (e.g. the chat room name, topic, maximum number of active users).

7.4   Message delivery requirements

Following requirements define the message delivery.

a) Message delivery shall be immediate i.e. messages are transported by the IMS system to the recipient's terminal (without notifications) subject to message filtering settings defined by the recipient or by the recipient's IMS service provider.

b) It shall be possible for the sender to receive delivery acknowledgements (success/failure) for sent messages.

7.5   Storage requirements

Session Based Messaging shall support global storage of sessions (accessible to all participants) and personal storage (accessible to the user who requested the storage). For personal storage, all storage operations listed below are applicable. In the case of global storage, users will be able to list and retrieve messages, not delete messages or turn storage on or off.

The following storage requirements shall be supported.

a) It shall be possible for a participant to request to persistently store a sent Session Based Message or all messages associated with a session in a network based repository if the IMS service provider provides such application level service.

b) IMS Messaging shall be able to support a request from a user to retrieve one or more messages stored in a network based repository.

c) IMS Messaging shall be able to support a request from a user to delete one or more messages or sessions that are stored in a network based repository.

d) IMS Messaging shall be able to support a request from a user to view the list of messages and message related attributes, such as sender, recipient, subject and date/time, in a network based repository.

7.6 User privacy requirements

Following requirements define user privacy.

a) It shall be possible for the recipient to see the public ID of the sender of the message unless the sender has requested to hide it.

b) It shall be possible for the sender of the message to request to hide its public ID from the recipient (anonymous sender).
The sender's public ID shall not be delivered to the recipient. The capability of public ID hiding is an IMS service provider and legislation issue and it may or may not be available. If the service is not available the message shall not be delivered to the recipient.

c) It shall be possible for the sender to use nickname when sending messages.
In case of nickname the recipient shall only be able to see the nickname but not the real address from which the message came from. It shall be possible to use nicknames for public and private messages. It shall be possible for the recipient to reply to the message sent with a nickname.

d) It shall be possible for a member of an IMS Messaging session to disable the reporting of the indication that they are entering a message ("Is Typing") on a per session basis. Further granularity levels for this requirement is for further study.

7.7 Message Filtering

It shall be possible for a subscriber to set up, modify, and delete filters in the network of the subscriber's IMS service provider, in order to control the treatment of a message by the network when a message is received. The filters shall also support the ability of the subscriber to specify the maximum size and type of message content etc that they are or are not willing to accept. The filters shall also support the ability of the subscriber to block (and unblock) messages from specific senders or anonymous senders.

Following specific requirements define the message filtering capabilities of the recipient.

a) It shall be possible to define specific message treatment based on following criteria

   1) sender address (including anonymous senders);

   2) message size;

   3) message class (e.g. advertisement, private....);

   4) message priority;

   5) message content type (e.g. video, audio....);

   6) message content format (e.g. mpeg, jpeg....);

   7) message type (e.g. immediate message);

   8) message subject; and

9) additional criteria maybe possible but are outside the scope of this document.

b) It shall be possible to specify the following message treatments in a filter:

1) Block the delivery of the message content.

2) Store the message content and notify recipient,

3) Store the message content for a specific time or until the recipient requests delivery.

4) Store and push the message content to recipient when available.

5) Redirect the message to another address.

6) Additional treatments maybe possible but are outside the scope of this document.

The IMS service provider shall also be able to set and control the filter settings either on behalf of the subscriber or based on policy.

8 Addressing requirements

It shall be possible to use a single address to identify the recipient. The single address shall be either a SIP URL, a network address identifier (NAI as defined in RFC2486 [3]) or a MSISDN.

IMS Messaging shall be based on existing IMS address resolution and routing mechanisms.

9 Security

The user shall be able to use IMS Messaging and access messages in a secure manner. It shall be possible for the contents of messages to be read only by the intended recipient(s). A recipient shall be informed of the reliability of the identity of the sender in case the sender has authorised his identity to be transmitted.

The integrity of messages during transit shall be assured to extent of the network capabilities.

IMS Messaging shall be intrinsically resistant to attempts of malicious or fraudulent use.

The "Security Threats and Requirements" specified in 3GPP TS 21.133 [4] shall not be compromised.

10 Charging

Charging for IMS Messaging shall be based on existing IMS charging mechanisms as appropriate.

IMS Messaging shall be able to support various charging models, including:

a) sender only pays;

b) both sender and recipient pay their respective charges for message delivery; and

c) recipient pays.

IMS Messaging shall be able to support different charging approaches:

a) volume based charging;

b) QoS based charging;

c) service based charging;

d) number of messages sent and/or received; and

e) offline charging or/and online charging.

IMS Messaging shall be able to support various charging mechanisms. The following charging characteristics may be considered:

   a) message content type and length;
   Message content type should be declared using a standardised declaration [the note may need to be moved to a different section e.g. message filtering].

   b) roaming conditions;

   c) prepaid subscriptions;

   d) time when the message is sent;

   e) time when the message is delivered;
   [FFS, "delivered" could indicate message stored, message read, message received by the terminal and so on…]

   f) message origin and destination;

   g) access network employed; and

   h) the charging information shall describe the amount of data sent and received to and from the external data network [Note: this is introduced to take into account the network(s) transited by message].

11   Interworking

11.1   General

It should be possible for the IMS Messaging subscriber to send/receive messages to/ from subscribers of 3GPP defined messaging services (SMS, EMS, MMS). Optionally, it should be possible to send/receive messages to/from users of fixed Internet messaging service (e.g. SMTP and SIMPLE based services).

11.2   Requirements for SMS-Immediate Messaging service-level interworking

These requirements shall be considered for SMS-Immediate Messaging service-level interworking:

   -    it shall be possible for a user to send an Immediate Message or an SMS message to another user without having to know which messaging client the receiving user has;

   -    The user experience shall be consistent with the SMS and Immediate Messaging service level expectations to as large an extent as possible. If the recipient is not available and deferred messaging is offered then the message shall be kept until delivery is possible or the message expires;

   -    When interworking from an SMS message to an Immediate Message, the network should deliver all content types in an SMS message to equivalent IMS content types where they exist;

   -    When interworking from an Immediate Message to an SMS message, the network should deliver all content types in an Immediate Message to equivalent SMS content types where they exist;

   -    When interworking from an Immediate Message to an SMS message and a form of anonymity has been requested by the sending party and the operator of the interworking function cannot identify the sending party, subject to operator policy, interworking shall be suppressed for that message. Subject to operator policy and / or the ability to identify the sending party, the sending party may be informed that the message could not be delivered.

   -    When interworking from an Immediate Message to an SMS message, it shall be possible for the sender of the Immediate message to request to hide its public ID from the recipient (e.g. be an anonymous sender). In this case the sender's public ID may not be delivered to the recipient subject to operator policy.

- Based on operator policy, it shall be possible for e.g., an SMS system or data download message such as an over the air configuration message, to be prevented from being interworked at a service level to an Immediate Message, but to instead by transported as an SMS message via IMS, CS or PS;

- If a user is registered to receive SMS service, then the SMS message should be delivered as an SMS message via IMS, CS or PS transport instead of via service-level interworking, subject to operator and user preferences;

- If a user is registered to receive Immediate Messaging service, then the Immediate Message should be delivered that way instead of via service-level interworking, subject to operator and user preferences;

- If an SMS user requests an SMS status report, then an SMS status report should be generated when the message is delivered using Immediate Messaging;

- If an IMS user requests a notification that the message was delivered to the recipient, an SMS status report should be generated when the message is delivered to the SMS user's client;

- It shall be possible to generate the appropriate charging-related information and provide the appropriate online charging mechanism (if it is applied for the SMS and/or Immediate Messaging services) for the interworking services.

11.3 Requirements for SMS-Session based Messaging service-level interworking

These requirements shall be considered for SMS-Session based messaging service-level interworking:

- Pre Release 10 UE shall be supported by SMS-Session based messaging service-level interworking.

- it shall be possible for a session based messaging user to send a messaging session invitation to an SMS user;

- When interworking from a Session based message to an SMS message, the network should deliver all content types in the Session based message to equivalent SMS content types where they exist;

- When interworking from an SMS message to a Session based message, the network should deliver all content types in an SMS message to equivalent Session based message content types where they exist;

- If an SMS user requests an SMS status report, then an SMS status report should be generated when the message is delivered using Session based message and a success or failure delivery notification has been received from the Session based message user;

- If a Session based message user requests a notification that the message was delivered to the recipient, an SMS status report should be generated when the message is delivered to the SMS user's client; an SMS status report should be communicated to a Session based message user as a delivery notification;

- A session invitation sent towards an SMS user is handled in one of 3 ways (dependent on service provider policies):

    1) The session invitation is accepted by the network on behalf of the SMS user.

    2) The session invitation is denied by the network on behalf of the SMS user.

    3) The SMS user is asked for consent for accepting the session invitation:

        - The session invitation will be delivered as an SMS message to the SMS user; the appropriate instructions should be included to guide the SMS user how to react (join/reject) the session invitation.

        - The SMS user will send back a response in an SMS message according to the embedded instruction if included.

- The user experience shall be consistent with the SMS and Session based messaging service level expectations to as large an extent as possible;

- For session based messaging the session based connectivity should be maintained for the SMS user so that the SMS user could:

- participate in the session (i.e. exchange messages)

- exit the session (no more message exchange) according to the instruction embedded in the SMS message.

- When interworking a session invitation from a Session based messaging service to an SMS message and a form of anonymity has been requested by the sending party and the operator of the interworking function cannot identify the sending party, subject to operator policy, interworking shall be suppressed for that session invitation. Subject to operator policy and / or the ability to identify the sending party, the sending party may be informed that the session invitation could not be delivered.

- When interworking a session invitation from a Session based messaging service to an SMS message, it shall be possible for the sender of the session invitation to request to hide its public ID from the recipient (e.g. be an anonymous sender). In this case the sender's public ID shall not be delivered to the recipient subject to operator policy.

- It shall be possible to generate the appropriate charging-related information and provide the appropriate online charging mechanism (if it is applied for the SMS and/or Session based messaging services) for the interworking services. Such charging related information shall take into account the one-to-many relationship of messages sent to a session.

Annex A (informative):
Change history

Change history											
TSG SA#	**SA Doc.**	**SA1 Doc**	**Spec**	**CR**	**Rev**	**Rel**	**Cat**	**Subject/Comment**	**Old**	**New**	**Work Item**
			22.abc					Produced during IMS Messaging interim SWG meeting 23rd-24th September, Reading, UK		0.0.0	IMSM
		S1-021873	22.abc					Revisions on the requirements mainly due to new document structure	0.0.0	0.1.0	IMSM
		S1-022052	22.340					TS number updated, introduction, scope and definitions added, remaining issues (except the one concerning storage requirements in session based messaging and one in interworking) marked with editor's notes resolved	0.1.0	0.2.0	IMSM
12 /12/02	SP-18	SP-020671	22.340					Raised to version 2.0.0 for presentation for approval at SA #18	0.2.0	2.0.0	IMSM
12 /12/02	SP-18	SP-020671	22.340					Approved at SA #18	2.0.0	6.0.0	IMSM
SP-19	SP-030032	S1-030260	22.340	0001	-	Rel-6	D	CR to 22.340 on required message formats for IMS messaging	6.0.0	6.1.0	IMSM-TS
SP-27	SP-050062	S1-050255	22.340	0002	-	Rel-6	F	Removal of Deferred Messaging Requirements	6.1.0	6.2.0	IMSM-TS
SP-30	SP-050654		22.340	-	-	Rel7	-	Raised to Rel-7 to allow reference by TISPAN	6.2.0	7.0.0	FBI
SP-35	SP-070124	S1-070262	22.340	0004	1	Rel-8	B	CR0004 on 22.340 for SMS - IM service level interworking reqs	7.0.0	8.0.0	MESSIW
SP-39	SP-080038	S1-080282	22.340	0005	2	Rel-8	C	Addition of Privacy requirements when Service Level interworking is performed	8.0.0	8.1.0	SLIMS
SP-39	SP-080038	S1-080279	22.340	0006	2	Rel-8	F	Clarification on storage requirements	8.0.0	8.1.0	SLIMS
SP-45	SP-090485	S1-093269	22.340	0007	2	Rel-10	B	Enhancements for CPM-SMS Interworking	8.1.0	10.0.0	CPM_SMS
2012-09	-	-	-	-	-	-	-	Updated to Rel-11 by MCC	10.0.0	11.0.0	