OMA IMPS Delta Requirements

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Open Mobile Alliance

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1. Scope (Informative)

The OMA Instant Messaging and Presence Service (IMPS) includes four primary features:

- Presence
- Instant Messaging
- Groups
- Shared Content

Presence is the key enabling technology for IMPS. It includes client device availability (my phone is on/off, in a call), user status (available, unavailable, in a meeting), location, client device capabilities (voice, text, GPRS, multimedia) and searchable personal statuses such as mood (happy, angry) and hobbies (football, fishing, computing, dancing). Since presence information is personal, it is only made available according to the user's wishes - access control features put the control of the user presence information in the users' hands.

Instant Messaging (IM) is a familiar concept in both the mobile and desktop worlds. Desktop IM clients, two-way SMS and two-way paging are all forms of Instant Messaging. Wireless Village IM will enable interoperable mobile IM in concert with other innovative features to provide an enhanced user experience.

Groups or chat are a fun and familiar concept on the Internet. Both operators and end-users are able to create and manage groups. Users can invite their friends and family to chat in group discussions. Operators can build common interest groups where end-users can meet each other online.

Shared Content allows users and operators to setup their own storage area where they can post pictures, music and other multimedia content while enabling the sharing with other individuals and groups in an IM or chat session. These features, taken in part or as a whole, provide the basis for innovative new services that build upon a common interoperable framework.

These features, taken in part or as a whole, provide the basis for innovative new services that build upon a common interoperable framework.

The OMA IMPS Specification Version 1.2 is the latest standard that defines technological framework and the protocol to build the IMPS service. The features and functions for OMA IMPS v1.2 are defined in [IMPSF&F] but there is still some room for optimization and improvement. This document identifies some high-level use cases that are not fulfilled in IMPS v1.2 and define the requirements that should be considered as such optimization and improvement possibility – which will be included in OMA IMPS v1.3. The document does not include requirements from the previous versions of the specifications. It is a ‘delta’ requirement document meaning that requirements are included only for those features, which are going to be changed.

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2. References

2.1 Normative References

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels". S. Bradner. March 1997.
URL:http://www.ietf.org/rfc/rfc2119.txt

[PRIVACY] Privacy requirements for mobile services
URL: http://www.openmobilealliance.org/ftp/PD/OMA-RD_Privacy-V1_0_0-20031104-A.zip

2.2 Informative References

[IMPSF&F] "WV-041 Features and Functions Version 1.2". Open Mobile Alliance. February 2003. URL: http://www.openmobilealliance.org/tech/release.html

[E.164] ITU-T Recommendation E.164 (05/97) The international public telecommunication numbering plan.
URL: http://www.itu.int/rec/recommendation.asp?type=folders&lang=e&parent=T-REC-E.164

[MMSCONF] MMS Conformance Document 1.2
URL:
http://www.openmobilealliance.org/ftp/Public_documents/MWG/MMS/permanent_documents/OMA-MMS-CONF-V1_2-20040727-C.zip

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3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

Alias	The name a user suggests others to use as NickName. Part of the User Presence – available only those who are authorized to retrieve it.
Auto login	A user setting within the device that allows the IMPS client to log into the IMPS service automatically without user action (e.g. selecting a "login" function or starting an application). The login sequence may be triggered at the client's discretion in a variety of ways (e.g. at power-on, when the service becomes available after an outage due to coverage, phone calls, use of other services etc.)
Contact	The representation of a single user in the IMPS technology – consist of a UserID and an optional NickName.
ContactList	A collection of Contacts that resides on the server, and essential part of presence authoring functions. It is possible to address IMs using the ContactListID as well.
Contact Details	A collection of information, which is available for the service provider only, and there is no way to retrieve it by any other user. The information is typically collected when the user buys his/her IMPS subscription.
Friendly Name	A name that the user suggests for the general public to use as a nickname and is available to all users at all times.
Inbox	A local repository on the client device where the incoming messages are stored.
MDN	A Mobile Directory Number (MDN) is used in 3GPP2. An MDN is a dial able number associated with the mobile station through a service subscription. A Mobile Directory Number is not necessarily the same as the mobile station identification on the air interface. An MDN consists of country code, national destination code, and subscriber number. An MDN consists up to 15 digits.
NickName	A name that is used internally in a client device to hide the UserID of contacts from the end-user. It is not possible to address other users using the NickName.
OnlineStatus	A presence attribute that indicates whether the client application (and the user) is logged on to an IMPS server or not.
Private Group Conversation	A temporary chat group that is the result of extending a one-to-one messaging to many-to-many messaging.
Phonebook	A local database in the terminal containing phone numbers, names, etc.
Public Profile	A user’s profile information that is available to the public – it is maintained by the owner user and is searchable with some restrictions.
Registration	The action or process by which an individual, who generally is a subscriber of the mobile network operator, becomes an active user of the IMPS.
ScreenName	A combination of a name a user chooses in a group session, and the Group-ID itself. The user MAY have different ScreenNames for different occasions as well as on different groups. The ScreenName is always connected to a group.
System Message	A special type of message sent by the IMPS system for different purposes (e.g. advice of charge, service notifications, advertisements, instructions, etc). System

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	Messages MAY contain a list of possible options and require actions or response from the user.
User-ID	Identifier for a single user that is unique across all IMPS services.

3.3 Abbreviations

IMPS	Instant Messaging and Presence Service
ISDN	Integrated Service Digital Network
MMS	Multimedia Message Service
MSISDN	Mobile Station International ISDN Number. A Mobile Station International Integrated Services Digital Network Number (MSISDN) is used in 3GPP. An MSISDN is a dial-able number associated with the mobile station through a service subscription. An MSISDN consists of country code, national destination code and subscriber number. An MSISDN MAY be up to 15 digits.
OMA	Open Mobile Alliance
SSP	Server-Server Protocol
WV	Wireless Village

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4. Introduction (Informative)

The Instant Messaging and Presence Service (IMPS) consist of four main service features:

- ¸ Presence feature,
- ¸ Instant messaging feature,
- ¸ Group feature, and
- ¸ Shared content feature.

A service provider may create its own IMPS community by providing either a full range of services or a subset of services. The service provider may also support the existing instant messaging communities on the Internet via an open interface.
The IMPS system provides a unique address space for presence, instant messaging, chat and content which is interoperable with existing instant messaging systems. The brief introduction of each feature is given below. Refer to [IMPSF&F] for more detail.

4.1 Presence Feature

Presence features are provided by the presence service element. Presence features can be separated into three defined parts: the definition of presence information for interoperability, the authorization and delivery mechanisms for presence information, and the contact list feature.

4.2 Instant Messaging Feature

Instant messaging features are provided by the instant messaging service element. The features include instant message origination and receiving, as well as delivery status reporting. Two separate receiving mechanisms are provided: direct push to the client as well as notification/pull. The instant messaging service is also used to send and receive instant messages through the group feature. Instant messaging using contact lists is also possible.

4.3 Group Feature

The concept of a user group means a chat room–type discussion forum formed either by a service provider or an individual WV user to exchange information such as opinions, comments, thoughts, etc., about a particular issue, which is the topic of the group. The group is a basic feature that allows the service providers to create communities of IMPS users.
Messaging to and from a group is done via the instant messaging features described earlier. Using the instant messaging features, the messages are directed toward a group instead of individual recipients. The key difference between group messaging and ordinary point-to-point messaging is that a group acts as a distribution mechanism for the messages. Consequently, every user that wants to receive messages from a group and participate in a discussion must join the group.
The users joined to a group may participate in the discussions using their WV user name, or they may pick a suitable screen name when joining to the group to maintain anonymity.

4.4 Shared Content Feature

The shared content feature allows IMPS users to share content, such as images and documents, while sending messages or chatting in a group.
In the current specification release, the shared content is realized with the common invitation function described in detail below. Using the invitation function, the users can send a URL of the content they are willing to share. Similarly, they can cancel the invitation when they no longer want to share the content. Currently there are no mechanisms to upload or download content.

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5. Use Cases (Informative)

5.1 Use Cases for Low memory clients

5.1.1 Managing block/grant/contact lists

5.1.1.1 Short Description

The user is managing its block/grant/contact lists, and adds a lot of users to it. The user does what he wants to, and he terminates the session in the end. Later the user logs in again and the client retrieves the block/grant/contact lists, but these lists are longer than the client can accept, so the lists are truncated. The user is wondering what is happening, where are the user-IDs he just added?

5.1.1.2 Actors

U – User

C – Client

S – OMA IMPS Server

5.1.1.3 Actor Specific Issues

C uses OMA IMPS v1.1 or v1.2 protocol, which is supported by S.

C has a small memory footprint meaning that it is not capable to handle long lists.

5.1.1.4 Actor Specific Benefits

None.

5.1.1.5 Pre-conditions

U has a valid subscription on S.

C is logged in to S:

The blocking mechanism is supported on both C and S, and it was agreed during service negotiation.

U has blocked/granted/contact lists, which already includes a lot of entries.

5.1.1.6 Post-conditions

C is able to retrieve the full block/grant/contact list for the U.

5.1.1.7 Normal Flow

U adds addresses to his/her block/grant/contact lists. C does not retrieve those as C has a local copy.

U finished messaging, and logs out. C purges cached data.

U logs in again, and C needs to retrieve the block/grant/contact lists.

S sends as much data as possible to C within the response, but S cannot send all data as C has limited memory.

U is wondering where the addresses he/she added lately to the lists are.

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5.1.1.8 Operational and Quality of Experience Requirements

- The protocol allows retrieval of long lists in parts.

5.1.2 Retrieving the list of joined users

5.1.2.1 Short Description

A user joins a discussion group, and retrieves the list of joined users. Since the list is too long, it is truncated. The user receives instant messages from other users in the same group, while he thought those users have not even joined. So he is wondering what is wrong, why he cannot see that those other users have joined, too.

5.1.2.2 Actors

U – User

C – Client

S – OMA IMPS Server

5.1.2.3 Actor Specific Issues

C uses OMA IMPS v1.1 or v1.2 protocol, which is supported by S.

C has a small memory footprint meaning that it is not capable to handle long lists.

5.1.2.4 Actor Specific Benefits

None.

5.1.2.5 Pre-conditions

U has a valid subscription on S.

C is logged in to S:

The group and messaging mechanisms are supported on both C and S, and was agreed during service negotiation.

5.1.2.6 Post-conditions

C has the full joined users' list, meaning that U is aware of all persons in the particular chat room.

5.1.2.7 Normal Flow

U joins a chat room.

C requests retrieval of the list of joined users from S.

S sends as much data as possible to C within the response, but S cannot send all as C has limited memory.

U receives instant messages from people that he is not aware of.

5.1.2.8 Operational and Quality of Experience Requirements

- The protocol allows retrieval of long lists in parts.
- U will be fully aware of others in the chat room.

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5.1.3 Retrieving presence information

5.1.3.1 Short Description

A user subscribed a few other users' presence information. The server may be implemented in a way that it collects presence updates, and sends these every 120 seconds. It means that occasionally the presence information to be sent to he client may be quite extensive. The server sends the presence update to the client – which does not have enough memory to handle it – then the client either displays only part of the presence information, or it simply crashes. The user does not have any idea what happened.

5.1.3.2 Actors

U – User

C – Client

S – OMA IMPS Server

5.1.3.3 Actor Specific Issues

C uses OMA IMPS v1.1 or v1.2 protocol, which is supported by S.

C has a small memory footprint meaning that it is not capable to handle long lists.

S collects presence updates and sends those out in a timely manner.

5.1.3.4 Actor Specific Benefits

None.

5.1.3.5 Pre-conditions

U has a valid subscription on S.

C is logged in to S:

The presence mechanism is supported on both C and S, and was agreed during service negotiation.

5.1.3.6 Post-conditions

C has received the full presence update, meaning that U has all of the updated presence information at all times.

5.1.3.7 Normal Flow

U subscribes to the presence information of a number of addresses.

S collects the presence updates of those addresses and sends these out every 120 seconds.

S collected presence updates from a lot of users.

S sends as much data as possible to C within the presence update, but S cannot send all as C has limited memory.

U looks at his terminal and thinks his colleague is in the office, while the colleague has left already – so U is misinformed.

5.1.3.8 Operational and Quality of Experience Requirements

- The protocol allows retrieval of long lists in parts.
- U will not be misinformed due to memory limits of his/her C.

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5.2 Use Case Add Contact By IMPS User ID

5.2.1 Short Description

This use case describes the addition of a known contact. The user inputs the IMPS User ID of his friend. After validity checks, the IMPS User ID, enhanced with a Nickname, is added to the Contact List. Depending on the added user's authorization model, the OnlineStatus is either visible immediately, or after an authorization request has been approved.

5.2.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
UserB	A human user of the IMPS Service, whose IMPS User ID is known to UserA
ClientA	The terminal and software that UserA is using to access IMPS services.
ClientB	The terminal and software that UserA is using to access IMPS services.
Server	The server providing IMPS services

5.2.3 Actor Specific Issues

Actor	Description
UserA	• Enlarge his List of Contacts. • Be able to communicate with his Contacts. • Protect his own privacy.
UserB	• Enlarge his List of Contacts. • Be able to communicate with his Contacts. • Protect his own privacy.
Server	• To enable the users to communicate by means of instant messaging and presence and store the up-to-date Contact Lists.

5.2.4 Actor Specific Benefits

Actor	Benefit
UserA	• Is able to see OnlineStatus of, and communicate with UserB
UserB	• Is able to see OnlineStatus of, and communicate with UserA without typing in UserA's User-ID.
Server	• The number of communicating users increases, encouraging messaging traffic, and hence revenue

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5.2.5 Pre-conditions

- UserA is a registered user of the IMPS service, logged in, and has negotiated IM functions (including blocking) and presence functions (including contact list functionality) using ClientA.
- UserB is a registered user of the IMPS service.
- UserA knows the IMPS User ID of UserB

5.2.6 Post-conditions

- UserA has UserB on his Contact List.
- UserA is authorized to see UserB's OnlineStatus and is able to message him.
- UserB has UserA on his Contact List.
- UserB is authorized to see UserA's OnlineStatus and is able to message him.

5.2.7 Normal Flow

1. UserA navigates to the contact database on ClientA, and starts adding a new contact.
2. UserA inputs the IMPS User ID of UserB.
3. UserA optionally inputs a Nickname for UserB.
4. ClientA sends a request to the Server to
    a. add UserB to UserA's selected Contact List with the specified UserID and NickName,
    b. add UserB to UserA's GrantList,
    c. add proactive authorization to UserB to see UserA's OnlineStatus.
5. The Server verifies that the IMPS User-ID to be added is valid.
6. The Server adds UserB's User-ID and NickName to the contact list that UserA requested.
    a. If UserA has not specified the Nickname, the Server sets the Nickname to UserB's Friendly name.
    b. If UserB has not set a Friendly name, the Server sets the Nickname to UserB's User ID.
7. The Server adds UserB to UserA's GrantList (ignore if already there).
8. The Server creates a non-ContactList-specific proactive authorization for UserA's Default-List so that UserB is able to access the OnlineStatus attribute of UserA (ignore if already there).
9. Finally the Server sends the response to ClientA with the newly added User-ID and Nickname.
10. ClientA saves the newly added User-ID and NickName to UserA's local contact database.
11. At the same time (see step 10) the Server sends a notification to UserB – unless UserB has explicitly requested not to be notified – that informs UserB about the fact that UserA has added UserB to one of his contact lists. UserA's ContactList-ID is not disclosed, but the notification includes UserA's User-ID and Friendly name (if available).
12. ClientB receives this notification.

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13. ClientB looks through UserB's contacts database and checks whether if UserA is already there. If found, use case ends here.

14. ClientB did not find UserA in UserB's contacts database, ClientB asks UserB whether he wants to add UserA to his contacts database. If UserB does not wish UserA to be added to his contacts, use case ends here.

15. If UserB wishes to add UserA to his contact database, ClientB restarts this use case from step 3 (as User-ID is already available and there is no need to fill it in) where the role of UserA and UserB, ClientA and ClientB is swapped. However no notification is sent to UserA.

5.2.8 Alternative Flow

5.2.8.1 UserA adds UserB to Contact List from Watcher List

The Watcher list (those users who have UserA on their Contact List) may be used as a platform for enlarging UserA's Contact List.

- UserA views his Watcher List, and sees UserB, who is not yet on UserA's contact list.
- UserA chooses the option "Add to Contact List" from the Watcher List Menu.
- The use case proceeds at step 3 in the basic use case described above, as the User-ID of UserB is already available.

5.2.8.2 UserA adds UserB to Contact List from group messaging

Groups are a great place to talk with "new" people. Sharing the User-ID within a group is up to the users though, so the use case described below will not work if UserB did not authorize showing his User-ID.

UserA joins a chat room, and gets involved in the discussion. He realizes that UserB is very much alike, and decides to add UserB to his contacts database.

- UserA checks the properties of UserB's ScreenName and notices that UserB's User-ID is available.
- UserA chooses the option "Add to Contact List" from the properties.
- The use case proceeds at step 3 in the basic use case described above, as the User-ID of UserB is already available.

5.2.9 Operational and Quality of Experience Requirements

- In order to simplify the user experience, it is recommended that the automated process described above:
    - is triggered easily, with minimal user interaction.
    - is widely accepted and used (e.g. to be defined as mandatory part of the contact list management functions).
- The users OnlineStatus is visible to authorized users.
- The notification includes Server defined text so that the server can deliver the notification in the currently set language and service UI style.

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5.3 Use Case Add Contact By MSISDN

5.3.1 Short Description

Note: The MSISDN is always considered to be in the format of E.164. [E.164]

This use case describes the addition of a known contact by mobile number. The user inputs the MSISDN of his friend. The Client performs a search request for the associated User ID. The server performs the search, and returns the result. If successful, the Client adds the returned User ID without user interaction, and the normal authorization flow takes place.

Note that user interaction is not required after input of the MSISDN; the client must perform the Search and Add tasks automatically.

5.3.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
UserB	A human user of the IMPS Service, whose MSISDN is known to UserA
Server	The IMPS Server application

5.3.3 Actor Specific Issues

Actor	Issue
UserA	• Enlarge his List of Contacts. • Wants to communicate with his friend UserB, whose MSISDN UserA knows.
UserB	• Enlarge his List of Contacts. • Wants to communicate with his friend UserA • Wants to maintain his privacy
Server	• Wants to enable the users to communicate by enlarging the Contact Lists of both users

5.3.4 Actor Specific Benefits

Actor	Benefit
UserA	• Is able to see status of, and communicate with UserB
UserB	• Is able to see status of, and communicate with UserA
Server	• The number of communicating users increases, encouraging messaging traffic, and hence revenue

5.3.5 Pre-conditions

- UserA knows UserB's mobile phone number

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- UserB has registered with the IMPS service
- UserB has proactively authorized the general public to see his default presence attributes

5.3.6 Post-conditions

- UserA has UserB on his Contact List.
- UserA is authorized to see UserB's Presence Attributes.
- UserB has UserA on his Contact List.
- UserB is authorized to see UserA's OnlineStatus and is able to message him.

5.3.7 Normal Flow

1. UserA navigates to the Contact List page on his IMPS Client, and chooses an option named "Add Contact".
2. UserA inputs the MSISDN of UserB (which he knows).
3. UserA optionally inputs a Nickname for UserB
4. The Client sends a search request to the Server to find the corresponding IMPS User-ID.
5. The Server uses the MSISDN to search for the corresponding IMPS User-ID.
6. The Server sends a search response with IMPS User-ID to the Client.
7. The Client requests that the User ID be added to UserA's Contact List **without** UserA's intervention.
8. The Server adds the IMPS User-ID and the Nickname to the Server Contact List.
    a. If UserA has not specified a Nickname, the Server sets the Nickname to UserB's friendly name.
    b. If the Nickname has not been specified by UserA and UserB has not set a friendly name, the Server sets the Nickname to UserB's MSISDN.
9. The Client saves the IMPS User-ID and the Nickname to the local (client) contact list. Note that this is seamless to the user, as it is done in the background
10. The Server sends a notification to UserB that "UserA has added you" (unless UserB has requested not to be notified). See Use Case "System Message" for details on system notifications.
11. From this System Message, UserB may add UserA reciprocally to his own Contact List.

The workflow is depicted as a UML sequence diagram in Figure 1.

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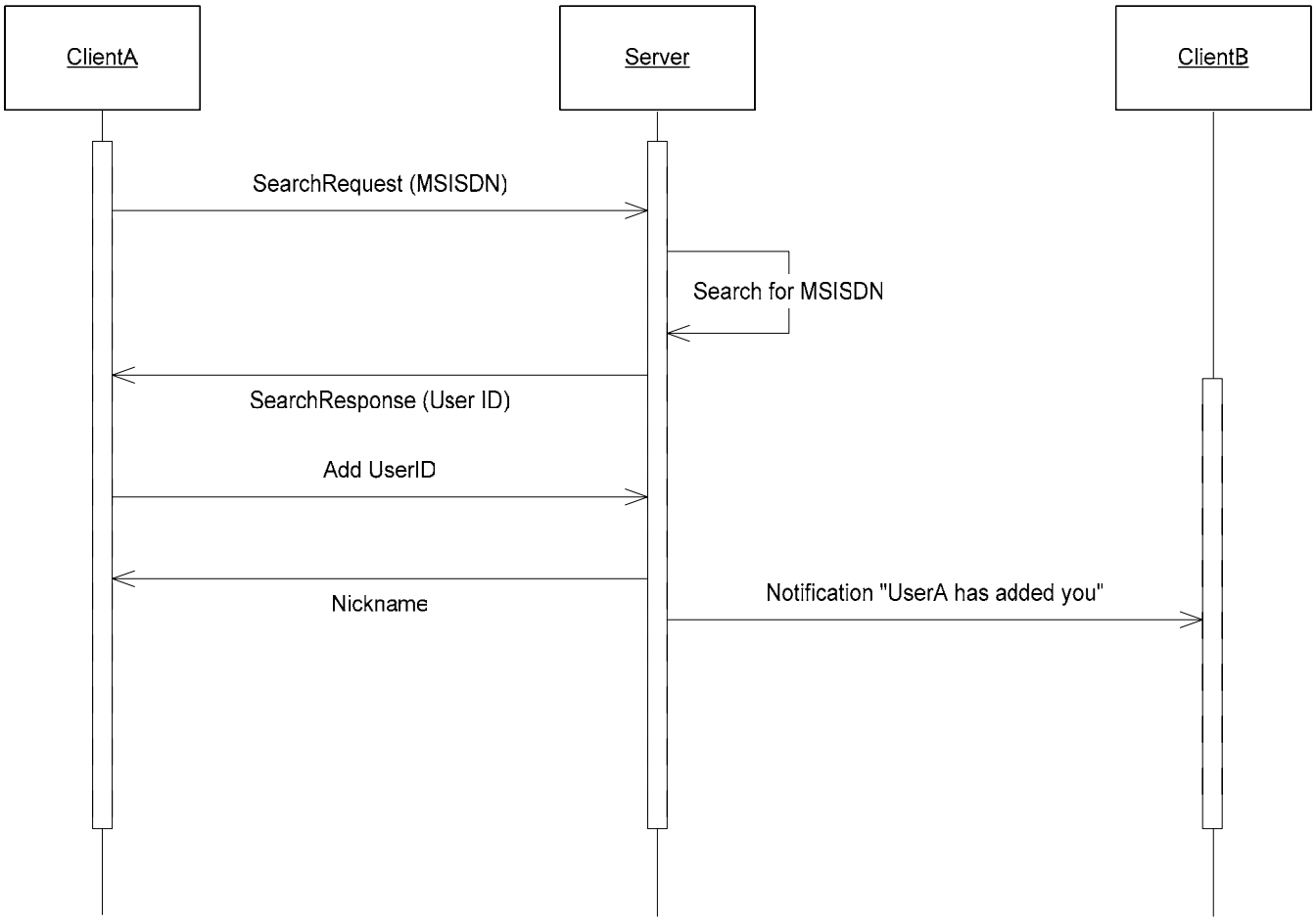

Figure 1: Sequence diagram of Add a Registered User by MSISDN Use Case

5.3.8 Alternative Flow - Add MSISDN from Phonebook

- The “Add By MSISDN” functionality should be implemented also as an option from the handset’s phonebook.
- The user may choose the option “Add from Phonebook” from the IM Client menu, OR the user may choose the option “Add to IM Contacts” from the phonebook menu.
- The nickname chosen will in this case be the same as the phonebook display name.

5.3.9 Operational and Quality of Experience Requirements

- In order to simplify the user experience, it is recommended that the automated process described above:
  - is triggered easily, with minimal user interaction.
  - Should be widely accepted and used (e.g. to be defined as mandatory part of the contact list management functions).
- The users OnlineStatus is visible to authorized users.
- The notification includes Server defined text so that the server can deliver the notification in the currently set language and service UI style.

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- The client and the server will be capable of an MSISDN search (add by MSISDN and search corresponding WV ID)
- This function should be done with minimum user interaction.
- The traffic load is minimized.
- The Service Provider is able to refuse wildcard characters in MSISDN add.
- A user is able to add another user by MSISDN regardless if that user is registered to that service at that time.

5.4 Use Case Search By Contact Details

5.4.1 Short Description

This use case describes the search for another user. UserA fills the criteria for First Name, Last Name or friendly name. The client requests a search, and receives in return a set of zero or more search results in the form User ID and friendly name. From these results, the user may add one or more of the returned users to his Contact List.

5.4.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
Server	The IMPS Server application

5.4.3 Actor Specific Issues

Actor	Issue
UserA	• Wants to enlarge his List of Contacts. • Wants to communicate with known friends.
Server	• Wants to enable users to communicate by enlarging their Contact Lists

5.4.4 Actor Specific Benefits

Actor	Benefit
UserA	• Is able to find and add his friends.
Server	• The number of communicating users increases, encouraging messaging traffic, and hence revenue

5.4.5 Pre-conditions

- UserA knows his friend's First Name, Last Name, or friendly name

5.4.6 Post-conditions

- UserA can see his friend as a search result, and from there may add to his Contact List.

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5.4.7 Normal Flow

1. UserA navigates to the Contact List page on his IMPS Client, and chooses an option named “Search for Contact”.
2. UserA inputs at least one of the fields First Name, Last Name or friendly name.
3. The Client requests a search for users fulfilling the search criteria.
4. The Server returns a list of User IDs and corresponding Nickname (friendly name as defined by the searched user) to the client.
5. UserA may choose one or more of the returned users, and add to his Contact List

The workflow is depicted as a UML sequence diagram in Figure 2.

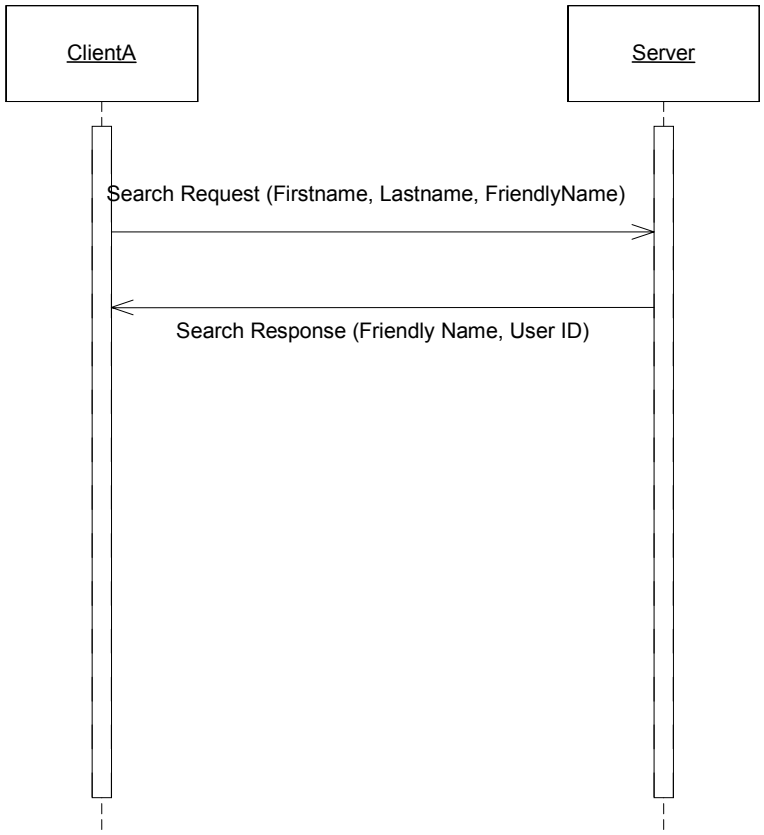

Figure 2: Sequence diagram of the Search By Contact Details Use Case

5.4.8 Operational and Quality of Experience Requirements

- A search for known friends is possible in the home domain.
- A search for known friends should be possible in an interconnected domain
- If there are more search results than can be reasonably displayed on the client the server is responsible for handling this.
- In order to maintain privacy, and ensure usability on mobile devices, IMPS implementations should not allow the use of wildcard characters in searches.

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- The Service Provider is able to refuse wildcard characters in searches.
- In order to maintain privacy, Contact Details such as Name or Email address won't be returned by searches.
- In order to make the search result comprehensible for the user, the friendly name of the returned user is presented before the User ID.

5.5 Use Case Send where UserA is not on UserB's Contact List

5.5.1 Short Description

This use case describes the sending of an Instant Message to an online user where the receiving user does not have the sending user on his contact list.

5.5.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
UserB	A human user of the IMPS Service
Server	The IMPS Server application

5.5.3 Actor Specific Issues

Actor	Issue
UserA	• Wants to communicate with his friend UserB.
UserB	• Wants to be available for messaging. • Wants to protect his privacy.
Server	• Wants to enable the users to communicate, in order to increase revenue.

5.5.4 Actor Specific Benefits

Actor	Benefit
UserA	• Can communicate online with UserB.
UserB	• Can communicate online with UserA.
Server	• The number of online users increases, encouraging messaging traffic, and hence revenue.

5.5.5 Pre-conditions

- UserA has UserB on his Contact List.
- UserB does not have UserA on his Contact List

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- UserA and UserB are both online

5.5.6 Post-conditions

- UserA and UserB have an IM session.
- UserB has UserA on his Contact List

5.5.7 Normal Flow

1. UserA chooses UserB from his Client Contact List.
2. UserA types and sends an Instant Message to UserB.
3. The Server checks that UserB is online and accepts messages from users not on his contact list (assumed true in basic workflow).
4. The Server sends the message to UserB.
5. UserB's Client alerts UserB to the incoming message by screen icon and sound.
6. In the normal messaging case, it is assumed that messages from UserA are displayed with UserA's Nickname. Since UserA is not on UserB's Contact List, then messages from UserA should be displayed with UserA's Friendly name
7. UserB may reply with a message to UserA.
8. UserB's client adds UserA to UserB's contact list if UserB replies to UserA.

The workflow is depicted as a UML sequence diagram in Figure 3.

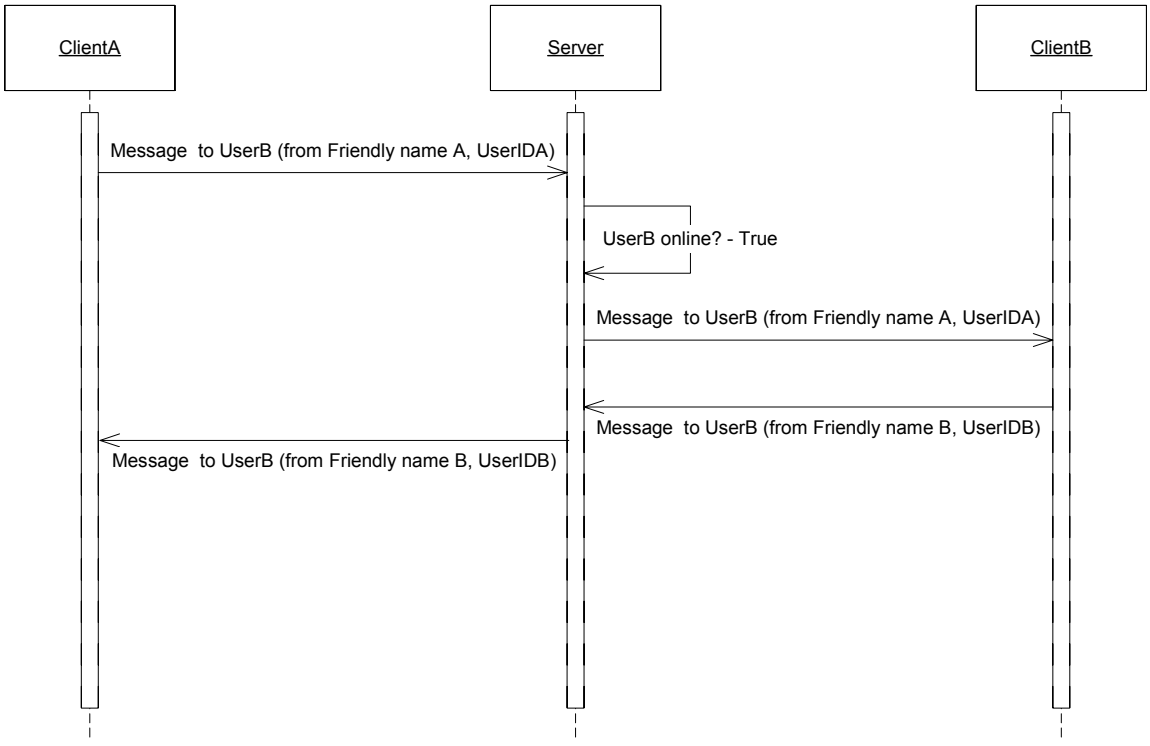

Figure 3: Sequence diagram of the Online Messaging Use Case

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5.5.8 Operational and Quality of Experience Requirements

- Note that in order to achieve faster delivery times and reduce unnecessary traffic, the server should push the messages to the client, rather than the client polling for messages.
- Users should be able to choose different alerts (icon on screen and sound/vibration) for different IMPS actions e.g. new message, friend coming available, new invitation received. At minimum there must be a generic alert for these actions and a new message icon.
- The sending user will be identified by both User ID and Friendly name

5.6 Use Case Send Instant Message (Offline)

5.6.1 Short Description

This use case describes the sending of an Instant Message to an offline user. If the sender is not blocked to message the offline recipient, the message is delivered the next time that the recipient logs in. A notification is sent to the recipient, to let him know that an offline message is waiting.

5.6.2 Actors

Actor	Description
UserA	A human user of the IMPS Service.
UserB	A human user of the IMPS Service.
Server	The IMPS Server application

5.6.3 Actor Specific Issues

Actor	Issue
UserA	• Wants to communicate with his friend UserB, regardless of UserB's online status.
UserB	• Wants to be notified if he has messages waiting
Server	• Wants to enable the users to communicate, in order to increase revenue.

5.6.4 Actor Specific Benefits

Actor	Benefit
UserA	• Can send offline messages to UserB.
UserB	• Can receive offline notifications of messages from his friends.
Server	• Users are encouraged to come online, encouraging messaging traffic, and hence revenue.

5.6.5 Pre-conditions

- UserA has UserB on his Contact List.

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- UserA is online; UserB is offline.

5.6.6 Post-conditions

- UserB goes online
- UserA and UserB have an IM session.

5.6.7 Normal Flow

1. UserA chooses UserB from his Client Contact List. UserB is shown as offline, but the client still allows a message to be composed.
2. UserA types and sends an Instant Message to UserB.
3. The Server checks that UserB is online (assumed false in basic workflow).
4. The Server sends an offline message notification to UserB.
5. UserB logs in
6. The Server sends the message to UserB
7. UserB may reply with a message to UserA

The workflow is depicted as a UML sequence diagram in Figure 4.

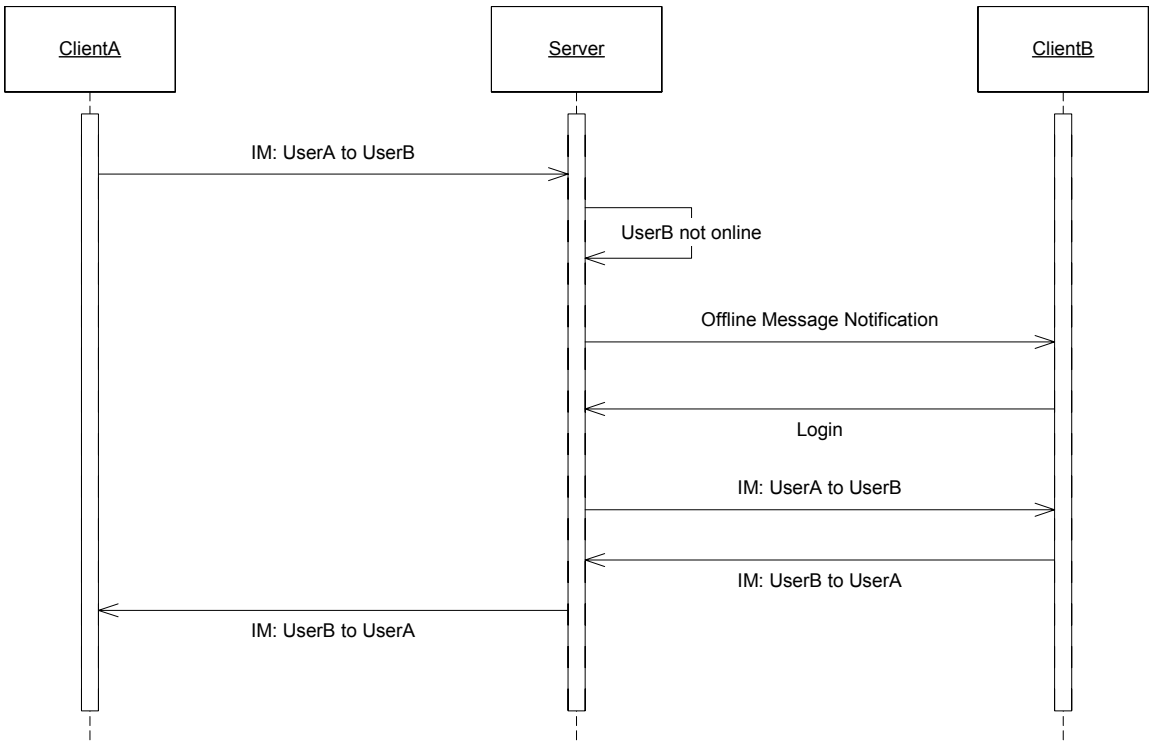

Figure 4: Sequence diagram of the Offline Messaging Use Case

5.6.8 Operational and Quality of Experience Requirements

The transport mechanism for the offline message notification is still to be decided – this may be an SMS or WAP Push. In the case that WAP Push is used, the user should be offered a link that logs him into the IM client, and shows him the message content immediately.

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5.7 Use Case Extend IM to Private Group Conversation

5.7.1 Short Description

This use case describes the seamless extension of a 2-way IM session to a multi-party private group conversation. Note that from the user perspective, these types of conversation are identical.

UserA, while in an IM session with UserB, decides to invite UserC to the conversation. The IM session is closed and Group conversation opened for UserA and UserB. UserC joins the conversation as normal. UserA and UserB do not perceive a change in the conversation other than the joining of UserC.

5.7.2 Actors

Actor	Description
UserA	A human user of the IMPS Service, UserA is the Group Creator. Has administration rights, but these should not be apparent to the user.
UserB	A human user of the IMPS Service, UserB is a Group Participant. UserB has user rights.
UserC	A human user of the IMPS Service, UserC is a Group Participant. UserC has user rights.
Server	The IMPS Server application

5.7.3 Actor Specific Issues

Actor	Issue
UserA	• Wants to include UserC in conversation with UserB
UserB	• Wants to maintain conversation with UserA
UserC	• Wants to be included in the conversation
Server	• Wants to encourage messaging

5.7.4 Actor Specific Benefits

Actor	Benefit
UserA	• Seamless transition to a group conversation.
UserB	• Seamless transition to a group conversation.
UserC	• Is able to join the conversation.
Server	• The number of users sending messages increases, and hence revenue increases.

5.7.5 Pre-conditions

- UserA has UserB and UserC on his Contact List

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- UserA and UserB have an IM session together

5.7.6 Post-conditions

- UserA and UserB's IM session is closed
- UserA, UserB and UserC are in a Private Group Conversation

5.7.7 Normal Flow

1. UserA and UserB exchange IM messages.
2. UserA (or UserB) decides to invite an extra user, UserC to the conversation.
3. UserA's Client sends a request to create the group with members UserA, UserB and UserC to the Server.
4. UserA's Client joins the group and closes the IM session. This is done silently, such that UserA does not see the change from IM to Group conversation.
5. The Server creates the new open non-searchable group.
6. The Server sends invitations to join the group to UserB and UserC.
7. UserB's Client recognizes that the invitation is from UserA, with whom UserB is chatting.
8. UserB's Client joins the group and closes the IM session. This is done silently, such that UserB does not see the change from IM to Group conversation.
9. UserC accepts the invitation and joins the group in the conventional way.
10. All participants will be notified that UserC is joining the group. This may be done by a joining icon in the conversation, or a message such as "UserC has joined".

The workflow is depicted as a UML sequence diagram in Figure 5.

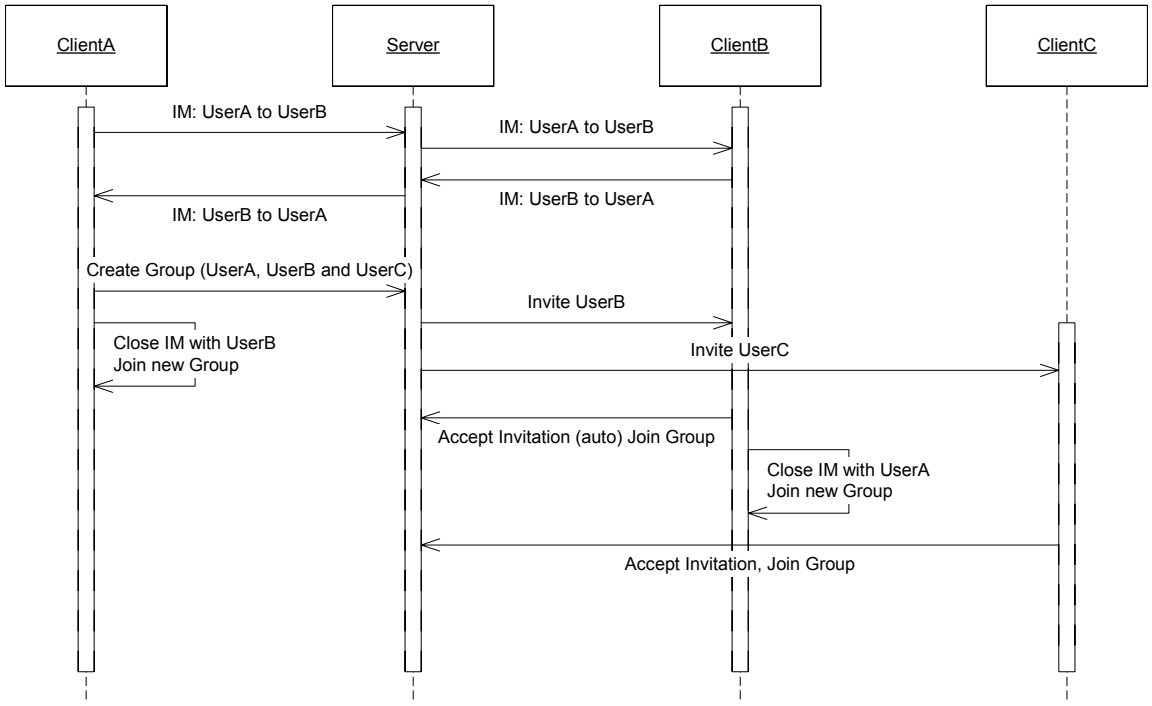

Figure 5: Sequence diagram for Extend IM to Group Conversation Use Case

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5.7.8 Operational and Quality of Experience Requirements

- The transformation from IM to Group conversation is seamless for both UserA and UserB.
- UserC won't get the message history
- IM and Group Conversation should not be differentiated in the client, the user should not see any difference between these two types of conversation.
- In order to simplify the user experience, the screen name should be set to the user's friendly name by the client automatically. If the friendly name is non-unique in the private group conversation, the server adds a digit suffix to the friendly name to form a unique screen name. The client adopts this suffixed screen name.
- The group will be open and non-searchable to allow added users to add other users.
- The server ensures that non-invited users cannot join.
- In case UserC joins a message should be sent to all participants

5.8 Use Case Participate in Private Group Conversation

5.8.1 Short Description

This use case describes the user's participation in a Private Group Conversation. UserA creates the group conversation, and invites his friends UserB and UserC to join him. UserB and UserC accept the invitation, and join the group. The three friends exchange messages. UserA leaves the group first, followed by UserB and UserC. Once each user leaves, his group membership ceases. The group is not deleted when the creator leaves, rather when the last member leaves.

5.8.2 Actors

Actor	Description
UserA	A human user of the IMPS Service, UserA is the Group Creator. Has administration rights, but these should not be apparent to the user.
UserB	A human user of the IMPS Service, UserB is a Group Participant. UserB has user rights.
UserC	A human user of the IMPS Service, UserC is a Group Participant. UserC has user rights.
Server	The IMPS Server application

5.8.3 Actor Specific Issues

Actor	Issue
UserA	• Wants to create a conversation with his friends UserB and UserC
UserB	• Wants to message UserA and UserC
UserC	• Wants to message UserA and UserB
Server	• Wants to encourage messaging

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5.8.4 Actor Specific Benefits

Actor	Benefit
UserA	• Can participate in a group conversation.
UserB	• Can participate in a group conversation.
UserC	• Can participate in a group conversation.
Server	• The number of users sending messages increases, and hence revenue increases.

5.8.5 Pre-conditions

- UserA has UserB and UserC on his Contact List

5.8.6 Post-conditions

- UserA, UserB and UserC have finished their Private Group Conversation and left the group
- The group is deleted

5.8.7 Normal Flow

1. UserA chooses “Create Private Conversation” with participants UserB and UserC from his Client Contact List.
2. The user may choose a welcome message for the group. However, in order to simplify the group creation process, it is recommended that the Client application should not ask UserA to specify a Conversation Name, Conversation Topic, or Invitation Message. Instead, the Server should auto-generate these, and other necessary group properties.
3. UserA’s Client sends a request to create the group with members UserA, UserB and UserC to the Server.
4. The Server creates the group, and sends invitations to UserB and UserC.
5. UserB accepts and joins the group. The acceptance of the invitation brings UserB seamlessly into the group conversation.
6. UserC accepts and joins the group. The acceptance of the invitation brings UserC seamlessly into the group conversation.
7. UserA leaves actively the group. His membership is revoked, and he cannot rejoin the group. The group remains open.
8. UserB leaves actively the group. His membership is revoked, and he cannot rejoin the group. The group remains open.
9. UserC leaves actively the group. His membership is revoked, and he cannot rejoin the group.
10. As all members have left, the Server deletes the group.

The workflow is depicted as a UML sequence diagram in Figure 6.

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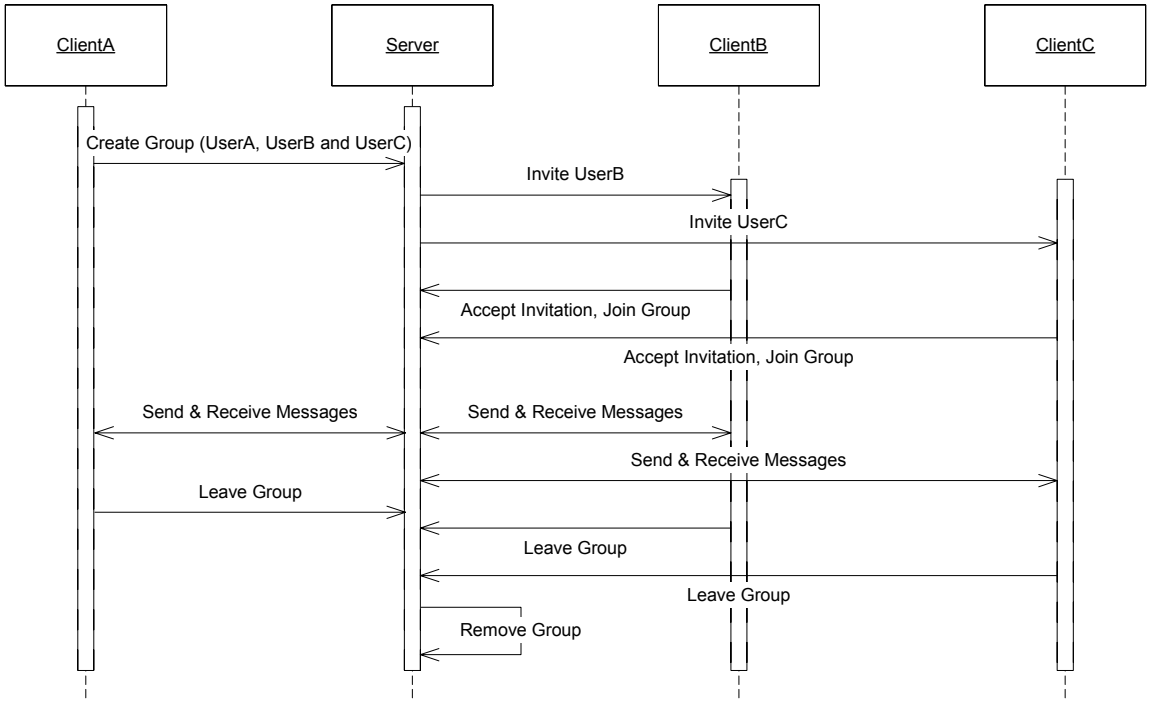

Figure 6: Sequence diagram for Group Conversation Use Case

5.8.8 Operational and Quality of Experience Requirements

- In order to simplify the User Interface, and create an egalitarian environment, neither group creator nor group participants should be able to expel users or delete the group.
- The Server administrator is responsible for responding to complaints, and subsequent expulsion of users.
- All users are able to invite other users to join the group.
- It is visible to all users when users join a private conversation:
    - An indication should be given within the conversation window when a new user joins
    - Any joined user may choose to view a list of all joined group members not just the creator and admin.
- Person-to-person communication ("whisper" functionality) should not be allowed within the group conversation.
- In order to simplify the user experience, the screen name should always be set to the user's friendly name by the client automatically. If this is non-unique in the private group conversation, the server should add a digit suffix to the friendly name to form a unique screen name. The client should adopt this suffixed screen name.
- Invitations from UserA who is blocked by UserB will not be delivered to UserB.
- If a user leaves the group passively (loss of network signal or browsing another application) the user is able to rejoin the group conversation for a limited timeout period. After that timeout period the user is considered to have actively left the group.

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5.9 Use Case Add/Update Public Profile

5.9.1 Short Description

This use case describes the addition of information to the Public Profile by the user. The Public Profile, or Public Identity, is the information that other users can view and search on, in order to find new friends. In order to encourage users to fill in their profile and facilitate search, users shall not be able to search for other users by profile until they have at least filled in all of the conditional fields of their own profile.

Note that all fields apart from Free Text are searchable. The search result is shown as friendly name in an overview list. The user may drill down into a detail view showing IMPS User-ID and the Search Result fields described below. The search result SHALL not include identifying information such as name, MSISDN, email address. The following table shows the fields supported by the Public Profile. The first name and last name are considered part of the Contact Details, not the Public Profile). Due to child protection users under a configurable age SHALL not be found by a search on public profile:

Field	Required	Searchable	In Search Result	Comment
Friendly Name	Mandatory	Yes	Yes	
Age	Mandatory	Yes	Yes	Entered as year and month of birth, searched for by age
Gender	Optional	Yes	Yes	
Intention*	Optional	Yes	Yes	
City	Optional	Yes	Yes	
Country	Mandatory	Yes	Yes	Default to country of MSISDN
Free text	Optional	No	Yes	

* For example: chat

5.9.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
Server	The IMPS Server application

5.9.3 Actor Specific Issues

Actor	Issue
UserA	• Wants to add his profile, so other users can get to know him • Wants to search for other users by profile
Server	• Increase the number of searchable profiles, so that users can find new friends • Inhibit voyeuristic users who may want to search, without giving information about themselves

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5.9.4 Actor Specific Benefits

Actor	Benefit
UserA	• Is enabled to search for other users by profile • Is enabled to be found by other users using search by profile
Server	• The number of communicating users increases, encouraging messaging traffic, and hence revenue

5.9.5 Pre-conditions

- UserA is registered with the IMPS Service and online

5.9.6 Post-conditions

- UserA has edited his Public Profile
- UserA is able to search for other users by profile
- UserA can be found by other users who use search by profile

5.9.7 Normal Flow

1. UserA navigates to the main menu on his IMPS Client, and chooses an option named “Public Profile”.
2. UserA enters or changes information in conditional fields (Age, Gender, Intention, City and Country)
3. UserA presses the “Save” button. Note that saving the inserted information is possible, even if all the conditional fields have not been filled completely (mandatory field friendly name must be filled). However the user shall not be able to search if these conditional fields have not been filled completely.
4. The client saves the changed information and returns it to the server to update UserA’s profile.
5. Before the information is searchable, UserA is presented with a system advice message, explaining the consequences to privacy of filling the profile and UserA must agree.

5.9.8 Alternative Flow - Clear Public Profile

Should the user desire to delete optional or conditional fields in his public profile, the client should give him the functionality to do so in one action as well. The workflow then looks like:

1. UserA navigates to the main menu on his IMPS Client, and chooses an option named “Public Profile”.
2. UserA chooses the option to “Clear Public Profile”
3. A confirmation message asks if the UserA really wants to clear his profile
4. On confirmation, the server and client delete all of the Public Profile information. The friendly name and Contact Details are **not** deleted.

5.9.9 Operational and Quality of Experience Requirements

- All fields apart from Free Text should be searchable.
- The search result is shown as friendly name in an overview list.
- The user may drill down into a detail view showing IMPS User-ID and the Search Result fields described below.
- Users without completed public profiles cannot search and cannot be searched.

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- The search result won't include identifying information such as name, MSISDN, email address.
- The first name and last name are not considered as part of the Public Profile.
- Due to child protection users under a configurable age cannot be found by a search on public profile.

5.10 Use Case Search by Public Profile

5.10.1 Short Description

Note: Friendly Name: A name that a user suggests for others to use as NickName

This use case describes the search for another user. UserA fills all conditional criteria friendly name, age, gender, intention, city and country. The client requests a search, and receives in return a set of zero or more search results. From these results, UserA may add one or more of the returned users to his Contact List.

5.10.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
Server	The IMPS Server application

5.10.3 Actor Specific Issues

Actor	Issue
UserA	Wants to enlarge his List of Contacts and thus his capacity to communicate.
Server	Wants to enable users to communicate by enlarging their Contact Lists. Wants to protect the privacy of searched for users.

5.10.4 Actor Specific Benefits

Actor	Benefit
UserA	Is able to find and add new contact new friends.
Server	The number of communicating users increases, encouraging messaging traffic, and hence revenue

5.10.5 Pre-conditions

UserA has entered his own Public Profile

UserA knows at least one criterion to search for

5.10.6 Post-conditions

UserA can see Public Profile information of other matching users, and from there can add to his Contact List.

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5.10.7 Normal Flow

1. UserA navigates to the Contact List page on his IMPS Client, and chooses an option named “Search by Public Profile”.
2. UserA chooses values or inputs data in at least one of the searchable fields described in public profile.
3. The Client requests a search for users fulfilling the search criteria.
4. If there are users matching the search criteria, and their numbers do not exceed a pre-set limit, the Server returns a list of these users
5. UserA browses through the results, clicking on the friendly names to look at the contacts’ Public Profiles
6. UserA may choose one or more of the returned users, and add them to his Contact List

5.10.8 Alternative Flow - UserA has not completely filled in his Public Profile

In this case the Search by Public Profile functionality SHALL NOT be available. Instead, UserA is brought to the “My Public Profile” screen from where he can fill his Public Profile.

Too many Results

- If more results are returned than UserA can reasonably read (maximum to be specified and depending on the used client device) then one of the following options could be used.
    - The search dialog could be re-opened, and UserA must refine his search criteria.
    - The server may return a selection (e.g. random) back to the device.
    - The server may return a series of selection (chunking) back to the device.

No results returned

If the search produces no results, then the search dialogue is re-opened, and UserA must relax his search criteria or exit the search.

5.10.9 Operational and Quality of Experience Requirements

- In order to maintain privacy, and ensure usability on mobile devices, IMPS implementations don’t allow the use of wildcard characters in searches.
- In order to make the search result comprehensible for the searching user, the Friendly Name of the returned user is presented before the User ID.
- Due to child protection users under a configurable age will not be found by a search on public profile
- Users, which have not filled out the mandatory part of their public profile won’t be returned by a search and are not able to search.
- The search result won’t include identifying information such as name, MSISDN, email address.
- The first name and last name are not considered as part of the Public Profile.
- If a UserA adds a searched UserB on his contact list UserB will see UserA’s status.

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5.11 Use Case Locate Friend and Show Map

5.11.1 Short Description

This use case describes the action of a user receiving textual and visual information about another user's location.

5.11.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
UserB	A human user of the IMPS Service
Server	The IMPS Server application

5.11.3 Actor Specific Issues

Actor	Issue
UserA	Wants to receive information about the whereabouts of UserB.
UserB	Wants to enable his friends to see his whereabouts. Wants to control his privacy.
Server	Wants to increase conversation traffic. Wants to protect the privacy of users.

5.11.4 Actor Specific Benefits

Actor	Benefit
UserA	Is able to receive information about the whereabouts of UserB.
UserB	Provides his friends information about his whereabouts, while protecting his privacy.
Server	Improves service attractiveness, thereby increasing traffic, and hence revenue.

5.11.5 Pre-conditions

UserA is on UserB's contact list.

UserB is on UserA's contact list.

UserB has chosen the non-default setting "Allow other users to see my location".

UserB has chosen UserA from his Contact List as a Contact authorized to locate him.

5.11.6 Post-conditions

UserA is aware of UserB's whereabouts.

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5.11.7 Normal Flow

UserA navigates to the Locate Contact menu on his IMPS Client.

UserA chooses to locate UserB.

The Server checks that UserA is authorized to see UserB's location.

The Server sends the respective location information to the Client.

UserA sees UserB's location in textual form (e.g. city and street name), and graphically via a corresponding map on his Client device.

The workflow is depicted as a UML sequence diagram in the Figure below:

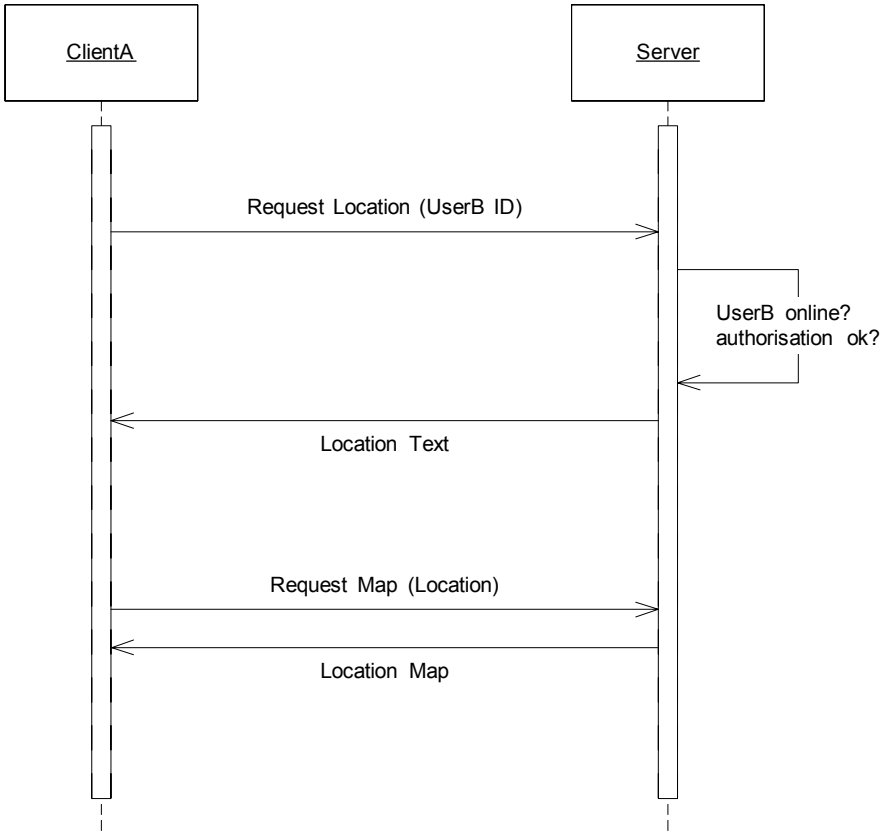

Figure 7: Sequence diagram of the Locate Friend and Show Map Use Case

5.11.8 Alternative Flow - UserA not authorized

If UserB has not authorized UserA to view his location information, then UserA receives an appropriate error message.

5.11.9 Operational and Quality of Experience Requirements

IMPS Client has the ability for users to grant or deny to other users the authority to locate them, in order for users to be able to locate one another while protecting their privacy.

This authorization is logically independent of the authorization to see other presence attributes and send messages.

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5.12 Use Case Auto-Registration

5.12.1 Short Description

This use case describes the automated, seamless registration of a user with the IMPS service. The registration process should appear similar to login from the user perspective. On opening the application, the Server authenticates the user via the MSISDN. A User ID is generated automatically, and the user is asked for an FriendlyName. The UserID is updated on the Client.

5.12.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
Server	The IMPS Server application

5.12.3 Actor Specific Issues

Actor	Issue
UserA	• Wants to register with the service • Wants to avoid unnecessary typing on a mobile phone
Server	• Wants to register many users, in order to increase revenue

5.12.4 Actor Specific Benefits

Actor	Benefit
User	• Is enabled to use the service • Is known within the IMPS service as a friendly name of his choice
Server	• Quicker and easier registration implies that greater number of users will try the service

5.12.5 Pre-conditions

- UserA is a mobile phone subscriber
- UserA is **not** a registered user of the IMPS Service.
- UserA's mobile device has appropriate pre-configuration (e.g. Client Name, Icons, Service Name, HomePage, IP address, GPRS IP Access Address, IMPS user id, IMPS password, login setting, default user privacy settings) to access the IMPS Service.
- If UserA's mobile device has a Boolean setting "Auto-Login on Phone Start-up" then this setting is OFF. This setting should not be editable by the user before registration.

5.12.6 Post-conditions

- UserA is registered with the IMPS Service.

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- UserA has a User ID and FriendlyName in the Server.
- If UserA's mobile device has a Boolean setting "Auto-Login on Phone Start-up" then this setting is ON.

5.12.7 Normal Flow

1. UserA navigates to the Client application on his IMPS mobile device.
2. On opening the application, the Client makes a login request to the Server. The User ID and password are passed as <User ID>/<password> (these should be pre-configured on the phone).
3. The MSISDN is automatically recognized and used by the Server for authentication.
4. The Server checks if the MSISDN is registered in the service. In this basic use case we assume that UserA is not previously registered and thus has no data available on the Server.
5. The Server recognizes that UserA is new to the IMPS Service, and generates a new, unique, IMPS User ID.
6. The MSISDN is saved on the Server as an attribute of UserA.
7. The Server logs the new user into the IMPS service.
8. Optionally, the User ID is updated on the mobile device.
9. In order to provide a friendly name for the user, the Client requests a FriendlyName from UserA.
10. UserA inputs a non-unique name for himself, and this is saved on the Server as an attribute of UserA.

The workflow is depicted as a UML sequence diagram in Figure 8.

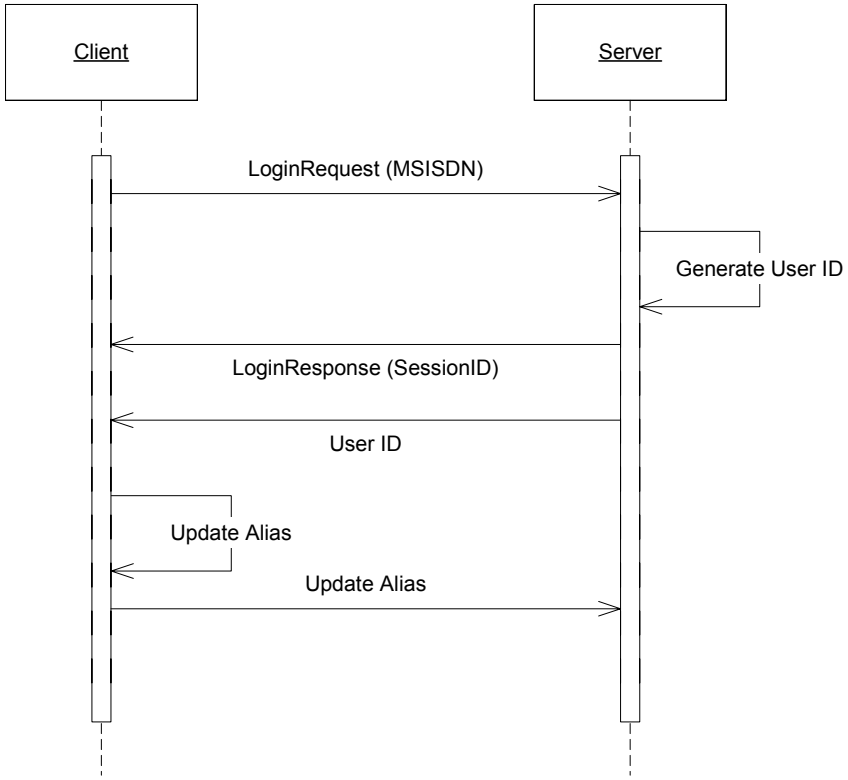

Figure 8: Sequence diagram of the Auto-Registration Use Case

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5.12.8 Alternative Flow

- If UserA ignores the request for an friendly name, then the friendly name should default to the newly generated IMPS User ID.

5.12.9 Operational and Quality of Experience Requirements

- In order to enhance the user experience, it is important that users be known by a friendly name. For this reason, the Client should insist on the user entering a FriendlyName on registration.

5.13 Use case Auto Login

5.13.1 Short Description

This use case describes automatic login to the IMPS service. On phone start-up, or when coming in to network range, the client mobile device logs in to the Server without user intervention. The user remains logged in until he actively logs out, turns phone off, or is out of network range.

5.13.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
Server	The IMPS Server application

5.13.3 Actor Specific Issues

Actor	Issue
UserA	• Wants to be online and use the IMPS Service. • Wants to be logged in automatically, to avoid unnecessary typing.
Server	• Wants to ease the login process for users, in order to increase revenue.

5.13.4 Actor Specific Benefits

Actor	Benefit
UserA	• The user need not worry about logging in and out, as he is online while the phone is on and in network range.
Server	• The number of online users increases, encouraging messaging traffic, and hence revenue.

5.13.5 Pre-conditions

- UserA is a registered user of the IMPS service.
- UserA has turned his mobile device off, or is out of network range.

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- UserA's mobile device has a Boolean setting "Auto-Login on Phone Start-up". This setting controls whether or not the mobile device automatically logs in to the IMPS service when connection is possible.
- UserA has turned this "Auto-Login on Phone Start-up" setting ON.

5.13.6 Post-conditions

- UserA has his mobile device on, and is within network range
- UserA is logged in to the IMPS service.

5.13.7 Normal Flow

1. The user turns on his IMPS mobile device, or comes into network range.
2. The Client application starts up and makes a login request to the Server.
3. UserA's MSISDN is automatically recognized by the Server and used for authentication.
4. The Server checks if the MSISDN belongs to a registered user of the service. For this use case we are assuming that UserA is registered
5. The Server sends a login response, allowing the Client to login
6. The Server updates UserA's status to be Online
7. The Client synchronizes the Contact List(s) with the Server (the user may have changed his details via another client).
8. The Client shows the Contact List(s), together with the OnlineStatus of UserA's Contacts.

5.13.8 Alternative Flow - UserA has turned the Auto-Login setting OFF

- In the event that the "Auto-Login on Phone Start-up" setting is OFF or non-existent, the User must manually log in.
- UserA navigates to the Client application on his IMPS mobile device.
- On opening the application, the Client makes a login request to the Server.
- The MSISDN is automatically recognized and used by the Server for authentication and login.

5.13.9 Operational and Quality of Experience Requirements

- The server is the master in the Contact List synchronization at login.

5.14 Use Cases for System Message

5.14.1 Common to all System Message use cases

5.14.1.1 Actors

The following actors have been identified for this use case:

- End-users – using an IMPS clients
- Server - The IMPS Server applications

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- Operators – operating an IMPS system, either offering here own IMPS service or operating a SAP gateway to access a 3rd party IMPS service.

5.14.1.2 Actor Specific Issues

- End-user:
    - Wants to use the service – but needs to be informed about for example cost, terms and conditions, etc, before using the service.
    - Wants to communicate with his friend User B, regardless of User B's online status.
    - Wants to be notified if he has messages waiting
    - Wants intelligible, helpful, context-sensitive information.
- Operator:
    - Due to business or legal reasons wants to control the level of service offered to the IMPS client. In case of 3rd party enabling this must be possible without being required to store information about the end-user, such as authentication information (username / pwd).
    - Does not want to establish transactions towards a 3rd party IMPS provider until the end-user has negotiated access to the service.
    - Provides users with advice on using the system

5.14.1.3 Actor Specific Benefits

- End-user:
    - Is prompted with the Service Message at an early stage during login (usability).
    - Can send offline messages to other Users.
    - Can receive offline notifications of messages from his friends.
    - Receives intelligible, helpful, context-sensitive information.
- Operator:
    - Network load and cost of running the service is minimized due to early interruption of the login.
    - Transactions towards 3rd party IMPS provider are minimized before the end-user has negotiated access to the service.
    - Users are encouraged to go online, encouraging messaging traffic.
    - Increases customer satisfaction.

5.14.2 Use Case for System Message type: Off-line Service Message

5.14.2.1 Description

Upon login to the IMPS service the IMPS system (e.g. SAP gateway to a 3rd party IMPS Service) may send an off-line Service Message to the IMPS client. The message is shown to the end-user. The end-user responds to the off-line Service Message (e.g. as confirmation for AoC or T&C) based on the answer options provided within the off-line Service Message. The response is used by the IMPS system to control level of service offered to the IMPS client.

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The end-user response may be used to influence the service negotiation later on in the login sequence (e.g. to allow use of Presence Features only but not IM and Group features).

If used for an AoC notification, the IMPS system (e.g. SAP gateway) allows the IMPS client to continue the login sequence to the IMPS service (e.g. 3rd party IMPS provider) according to the user's response.

5.14.2.2 Pre-Conditions

- IMPS client has not logged in to the service.
- The end-user has been provisioned or registered for the service by the Operator.
- The end-user must be prompted with an off-line Service Message upon next login attempt (e.g. to agree on AoC).

5.14.2.3 Post-Conditions

- The user has been prompted with an off-line Service Message and responded to it.
- The IMPS system has allowed the IMPS Client to access the service according to the end-user response.

5.14.2.4 Normal Flow

1. The IMPS client logs into the IMPS service.
2. The IMPS system checks (e.g. SAP gateway) whether the end-user's access to the service must be negotiated (e.g. by sending an AoC off-line Service Message) prior to allowing the login to the IMPS service to continue (e.g. handover the log-in request to the 3rd party service).
3. Since negotiation must take place, the IMPS system sends an off-line Service Message including one or more answer options to the client.
4. The end-user views the off-line Service Message and selects an answer option (e.g. Accept AoC, T&C etc.).
5. The IMPS client sends the response to the IMPS system.
6. The response of the end-user may be used by the IMPS system to update the status for service negotiation accordingly.
7. Based on the end user's response, the IMPS system decides which level of service is granted and whether or not the IMPS client is allowed to continue the login (e.g. the SAP gateway does handover the log-in request to the 3rd party service).

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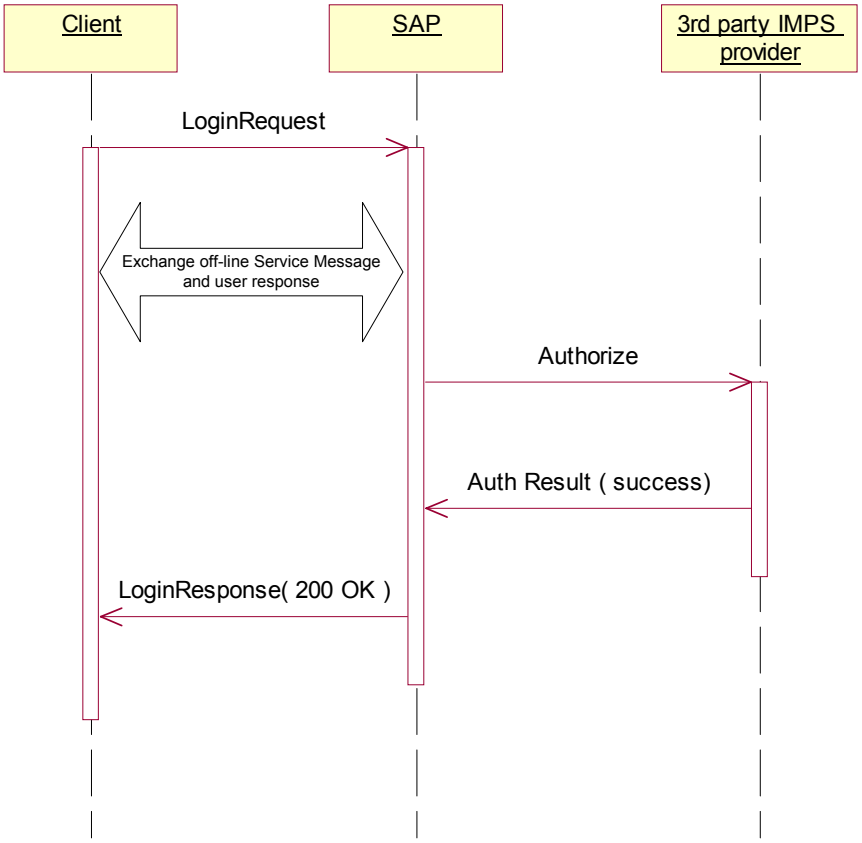

Example for AoC off-line Service Message for 3rd party IMSP (VASP) enabling

5.14.2.5 Alternative Flow

Same as main flow incl. bullet 3:

- The IMPS system does not receive a response from the IMPS client within some pre-determined timeframe.
- The IMPS system does not grant the IMPS client to continue the login sequence and therefore any access to the IMPS service (e.g. SAP gateway does not handover the login request to the 3rd party IMPS service).
- The IMPS Systems indicates the IMPS client about denial of access.

5.14.2.6 Operation and Quality of Experience Requirements

- The IMPS system supports sending the off-line Service Message to the client before the client is logged in to the IMPS service.
- The IMPS client supports means to handle and display service off-line Service Messages before logging in to the IMPS service.
- The IMPS system provides the same consistent order of user interaction comprised of the steps start of login, delivery of off-line Service Message and optional off-line Service Message response within an acceptable timeframe.

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5.14.3 Use Case for System Message type: Off-line User Message

5.14.3.1 Short Description

This use case describes the sending of an Instant Message to an offline user. If the sender is authorized to message the offline recipient, the message is delivered the next time that the recipient logs in. An off-line User Message notification is sent to the recipient, to let him know that an offline message is waiting.

The end-user responds to the off-line User Message (login / Ignore) based on the answer options provided within the off-line User Message.

5.14.3.2 Pre-Conditions

- UserA has UserB on his Contact List.
- UserA is online; UserB is offline.

5.14.3.3 Post-conditions

- UserB goes online.
- UserA and UserB have an IM session.

5.14.3.4 Normal Flow

1. UserA chooses UserB from his Client Contact List. UserB is shown as offline, but the client still allows a message to be composed.
2. UserA types and sends an Instant Message to UserB.
3. The Server checks that UserB is online (assumed false in basic workflow).
4. The Server sends an off-line User Message notification to UserB.
5. UserB selects an answer option (e.g. login, ignore etc.).
6. The IMPS client sends the response to the IMPS system.
7. In case of login the Server sends the message to UserB.
8. UserB may reply with a message to UserA.

The workflow is depicted as a UML sequence diagram in Figure 4

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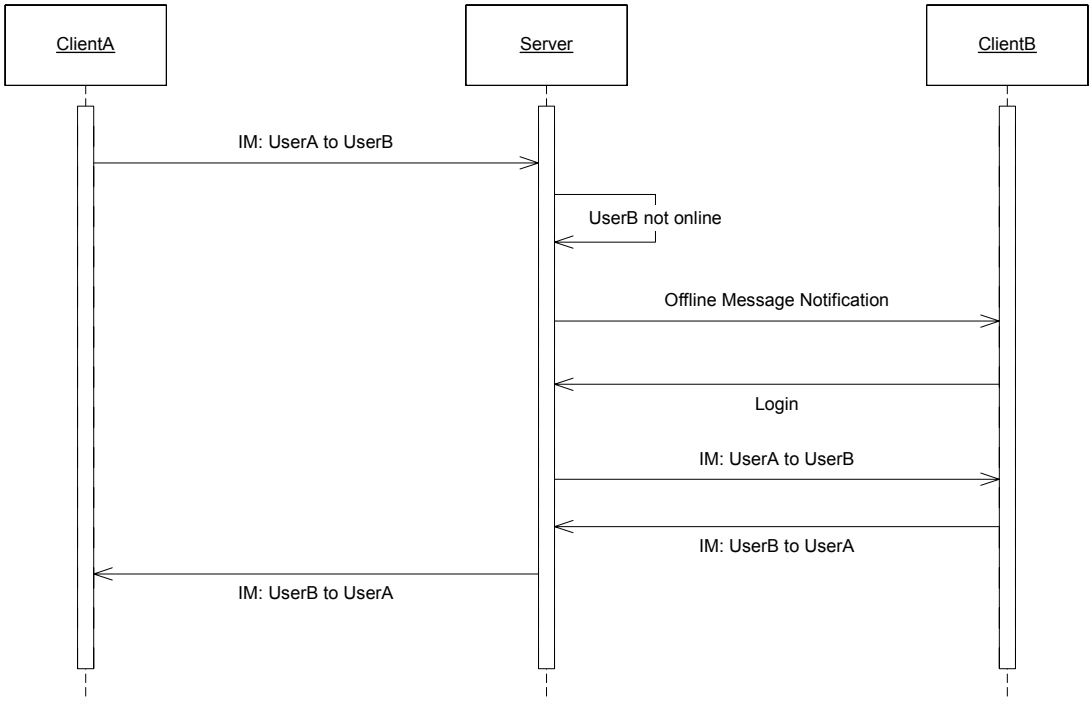

Figure 9: Sequence diagram of the off-line User Messaging Use Case

5.14.3.5 Operational and Quality of Experience Requirements

1. The IMPS system supports sending the off-line User Message to the client before the client is logged in to the IMPS service.
2. The IMPS client supports means to handle and display off-line User Messages before logging in to the IMPS service.
3. The IMPS system provides the same consistent order of user interaction comprised of the steps start of login, delivery of off-line User Message and optional off-line User Message response within an acceptable timeframe.

5.14.4 Use Case for System Message type: On-line Service Message

5.14.4.1 Short Description

This use case describes the sending of an on-line service or informational message to UserA. For various reasons, it can be advantageous for the system to provide the user with information and advice. Examples of this sort of information include:

- A welcome message and/or Terms and Conditions of the IMPS Service on first login.
- Privacy advice when the user makes sensitive presence information available.
- Help advice if the user makes repeated mistakes / receives repeated errors.
- Notification of being added to another user's Contact List.
- The end-user responds to the on-line Service Message (login / Ignore) based on the answer options provided within the on-line Service Message.

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5.14.4.2 Pre-conditions

- The system has a notification relevant to UserA. (E.g. T&C or notification of being added).
- UserA is logged in to the service.

5.14.4.3 Post-conditions

- UserA has read and responded to the message, optionally returning a choice to the server.

5.14.4.4 Normal Flow

1. The Server is triggered by an event to send an on-line Service Message to UserA. This event could be that UserA has used the service for the first time; UserA was added by another user; UserA has changed presence attributes authorization (e.g. UserA sets his authorization to proactive), etc.
2. The on-line Service Message is sent from the Server to UserA's Client.
3. UserA's Client displays the informational message to UserA.
4. In addition to the on-line Service Message, the system may show zero, one or more options to UserA. The text of these options is variable, and provided by the server at the time of the message.
5. UserA may respond to the message by choosing an option. Examples of options which might be presented to the user include "Accept" and "Cancel"; "Agree and "Disagree"; "Authorize" and "Deny authorization".
6. The IMPS client sends the response to the IMPS system.

The workflow is depicted as a UML sequence diagram in Figure 10:

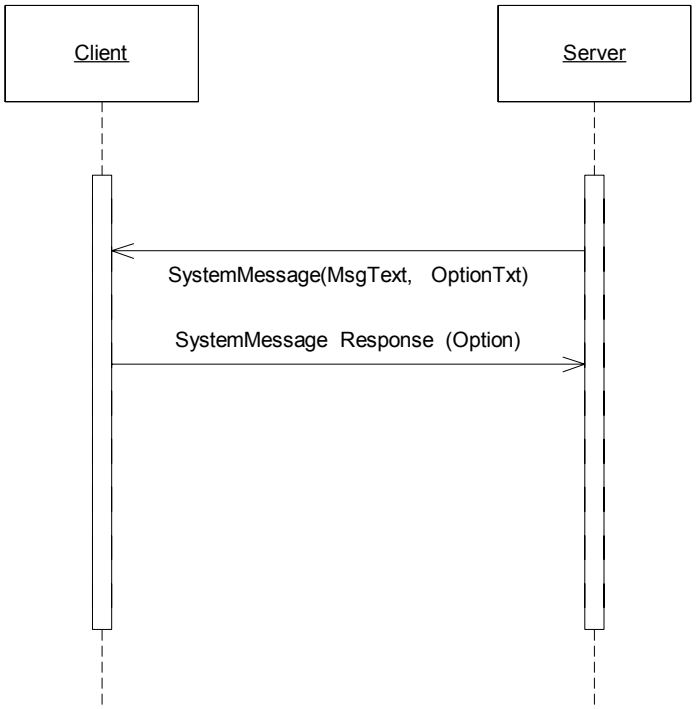

Figure 10: Sequence diagram for Push System Advice Use Case

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5.14.4.5 Alternative Flow

1. The Server is triggered by an event to send an on-line Service Message to UserA. This event could be that UserA has used the service for the first time; UserA was added by another user; UserA has changed presence attributes authorization (e.g. UserA sets his authorization to proactive), etc.
2. The on-line Service Message is sent from the Server to UserA's Client.
3. UserA's Client displays the informational message to UserA.
4. In addition to the on-line Service Message, the system may show zero, one or more options to UserA. The text of these options is variable, and provided by the server at the time of the message.
5. UserA must (depending on on-line Service Message type) respond to the message by choosing an option. Examples of options which might be presented to the user include "Accept" and "Cancel"; "Agree and "Disagree"; "Authorize" and "Deny authorization".
6. The IMPS client sends the response to the IMPS system.
7. Depending on the chosen option the server performs an action (e.g., accept T&C, add user to contact list)

The workflow is depicted as a UML sequence diagram in Figure 11:

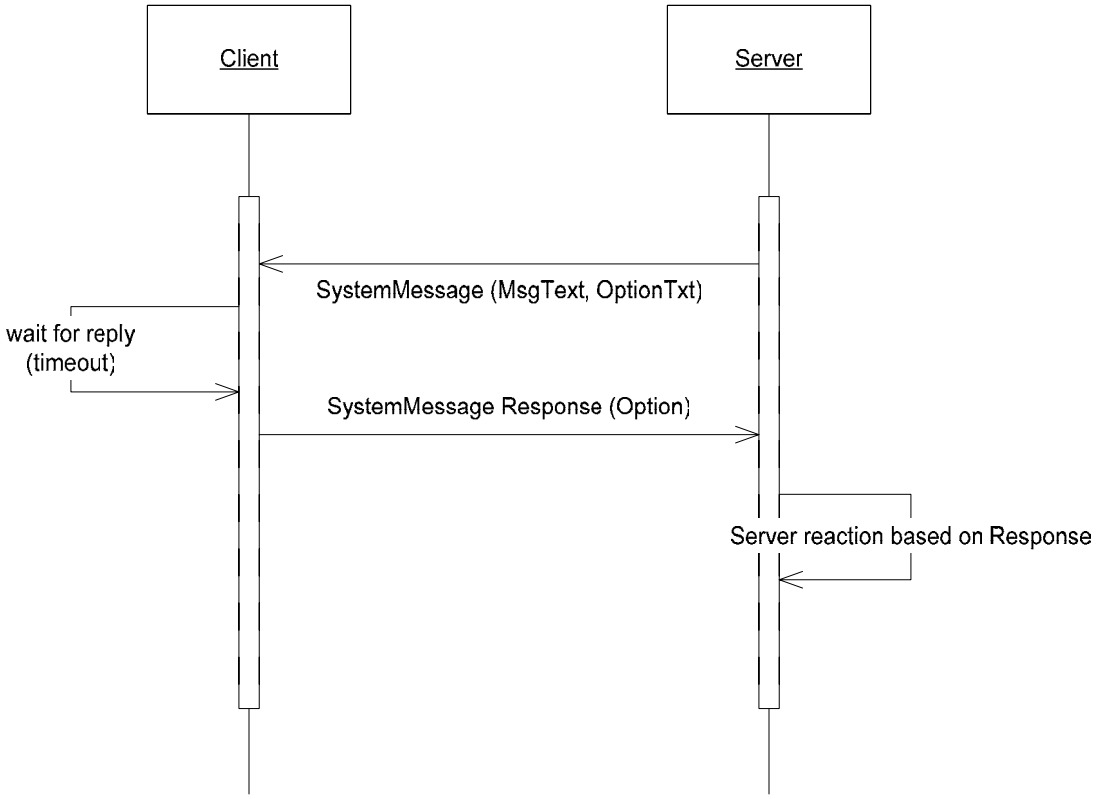

Figure 11: Sequence diagram for Push System Advice Use Case

5.14.4.6 Operational and Quality of Experience Requirements

1. For notification of UserA being added by UserB, UserA will have an option, which allows UserA to add UserB reciprocally to his Contact List.
2. For notification of e.g. Terms & Conditions or other messages which require an response, the user accepts or rejects the message

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3. For help messages, user should have an option “do not show any more help messages”. This sets a user preference not to show help messages automatically as they arrive. The user may still find and view help messages within user’s inbox. The user should be able to view the status of this user preference and enable it again.
4. The IMPS system supports sending the on-line Service Message to the client.

5.15 Advanced search

5.15.1 Short Description

This use case describes how advanced search allows a user to perform more specific searches.

5.15.2 Actors

User – IMPS user enjoying the IMPS services.

Client – IMPS client, which provides and interface to the user to access IMPS services.

Server – IMPS server, which provides the IMPS services.

5.15.2.1 Actor Specific Issues

User wishes to perform advanced searching in order to narrow the number of search results.

5.15.2.2 Actor Specific Benefits

User is able to find a specific result easier (with less searches).

IMPS users are more likely to use the IMPS service, as it is more useful.

5.15.3 Pre-conditions

User is properly authenticated and logged in, and knows the values for search criteria (name, phone number, etc).

Client supports and did negotiate search services.

Server is up and running.

5.15.4 Post-conditions

User receives the requested result(s).

5.15.5 Normal Flow

1. User wants to find a specific user-ID, so he activates the search functionality on his client.
2. User knows that his friend’s first name is John or Johnny, and has two mobile subscriptions. He does not know though which first name and phone number is registered to the IMPS service. So he defines a search criterion that indicates that the first name is either John OR Johnny, AND the phone number is either one OR another.

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3. The search continues normally from here: The client sends the search-criteria to the server, the server starts searching according to the criteria, and finally the server sends the results back.

5.15.6 Operational and Quality of Experience Requirements

- In order to save bandwidth the search is performed on the server. (This is already available in v1.2; this is included to make sure that it will remain the same in v1.3.)
- The client will be able to request a limited number of results. (This is already available in v1.2; this is included to make sure that it will remain the same in v1.3.)
- The client will be able to browse in the results (request earlier and later results). (This is already available in v1.2; this is included to make sure that it will remain the same in v1.3.)

5.16 Use of multiple applications/sessions

5.16.1 Short Description

This use case describes how multiple sessions can be utilized to enhance user experience by adding IM/presence based applications.

5.16.2 Actors

User – IMPS user enjoying the IMPS services.

Device – the hardware that the user uses to access IMPS service (mobile, laptop, PC, etc.)

Client – IMPS client, which provides and interface to the user to access IMPS services (device manufacturer provides this).

3APP – a third party IMPS application (in this case a turn-based game)

Server – IMPS server, which provides the IMPS services.

5.16.2.1 Actor Specific Issues

User wishes to be aware of his friends' presence information continuously – even while playing a game and using IM functionality.

5.16.2.2 Actor Specific Benefits

User is able to use multiple IMPS applications at the same time.

IMPS users are more likely to use the IMPS service, as it is more useful.

Ease and encourage the work of client application developers to implement IMPS-based applications.

5.16.3 Pre-conditions

User has a valid IMPS subscription, allowing User to access any IMPS service.

Device is up and running.

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Client is properly configured into the Device and supports all IMPS services.

3APP is properly installed and configured into the Device and supports those IMPS services that it needs for its normal operation.

Server is up and running.

5.16.4 Post-conditions

User happily enjoys the benefits of multiple sessions – using his IMPS client and another third party application at the same time.

5.16.5 Normal Flow

1. User starts the Client on his Device – proper authentication takes place between the User, the Client, and the Server, and a session is set up in order to access IM and presence services.
2. The Client subscribes to User's contacts' presence information and retrieves their presence information from the Server.
3. User feels bored so he decides to play a game with his friends, so he checks the presence information if his 'gamer' friends on his Client.
4. User notices that his friends are actually playing the game, and since he does not wish to miss the fun he starts up his 3APP.
5. Proper authentication takes place between the User, the 3APP and the Server, and separate session is set up since the 3APP cannot be aware of the session already created by Client.
6. 3APP subscribes to the game-specific presence information of the players, and retrieves the necessary presence information from the Server.
7. 3APP joins the group that the game is using to communicate with other players.
8. User starts playing the 3APP game, while he can separately send/receive instant messages via his Client.

5.16.6 Operational and Quality of Experience Requirements

- The separate sessions won't interfere with each other (e.g. presence subscriptions, joined groups).
- If there is no existing session and the Server offers offline storage, instant messages/invitations not targeted to a specific client will be queued up for a later delivery. (This is the basic requirement for servers offering offline storage; there is nothing new here. A server that offers offline storage will accept requests towards Clients that are not logged in as well.)
- If there is no existing session and the Server does not offer offline storage, instant messages/invitations won't be accepted for delivery. (This is the basic requirement for servers that do not provide offline storage; there is nothing new here. A server not offering offline storage will reject the requests towards Clients that are not logged in.)
- If there is at least one existing session, instant messages/invitations not targeted to a specific client will be delivered to all existing sessions. (This is the general messaging case, when the requesting end did not specify a target, so the message will be delivered everywhere.)
- If there is at least one existing session, instant messages/invitations targeted to a specific client – when the specific client is online - will be delivered to the specified client only. (A Client requested delivery for a specific client only, so it is obvious that the specific client needs to be addressed only.)
- If there is at least one existing session, instant messages/invitations targeted to a specific client – when the specific client is offline - won't be accepted for delivery. (A Client requested delivery for a specific

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client only – which is not available at the time of the delivery. The requesting Client needs to be fully confident that the other end is disconnected/logged out for some reason – so that the resources allocated can be freed.)

- User will be aware when a new session is established (charging, T&C).

5.17 Use of Remote User Session Management

5.17.1 Short Description

The end-user logs in to the IMPS service. The IMPS service consists of a local IMPS SAP responsible for connection handling and a remote IMPS SAP responsible for user session management. The two SAP entities communicate to establish a session on behalf of the end-user.

5.17.2 Actors

The following actors have been identified for this use case:

- End-users – using an IMPS clients
- Operator – Operates the IMPS SAP responsible for connection handling
- IMPS Service Provider – Operates the IMPS SAP responsible for user session management – may be collocated with the actual IMPS Service Elements.

5.17.2.1 Actor Specific Issues

- End-user:
    - Wants to use the IMPS service provided by the IMPS Service Provider on his mobile device.
- Operator:
    - Wants to enable the end-user to use the OMA IMPS service offered by the IMPS Service Provider.
    - May want to collocate connection points for multiple 3rd party IMPS services (such as SMPP connections, etc).
    - Wants to control the CSP or CLP link to the client without necessarily offering the IMPS service himself.
- IMPS Service Provider:
    - Wants to offer his IMPS service to mobile devices through the Operator.

5.17.2.2 Actor Specific Benefits

- End-user:
    - Is able to use the IMPS service provided by the IMPS Service Provider on his mobile device.
- Operator:
    - Is able to offer 3rd party IMPS services using standardized interfaces

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  - Is not required to store authentication information about the end-user

- IMPS Service Provider:
  - Is able to provide mobile users with his IMPS service through standardized interfaces

5.17.3 Pre-conditions

- IMPS client has not logged in to the service
- The Operator and IMPS Service Provider have a SSP Interoperability Agreement.

5.17.4 Post-conditions

- The IMPS client has been logged in to the service provided by the IMPS Service Provider.

5.17.5 Normal Flow

1. The IMPS client logs into the IMPS service by connecting to the SAP 1 operated by the Operator
2. The SAP 1 routes the login request to the SAP 2 operator the IMPS Service Provider
3. The SAP 2 creates the user session and routes the transaction response back to SAP 1
4. The SAP 1 notifies the IMPS client about the successful login.

5.17.6 Operational and Quality of Experience Requirements

1. The IMPS system will support user session management in a remote domain using the SSP protocol.
2. User Session Management includes the following operations:
   a. Login
   b. Logout
   c. Server Initiation Logout by the remote domain
   d. Keep Alive
   e. Get Service Provider Info
   f. Service Negotiation

5.18 Use Case: Sending an announcement in a chatting

5.18.1 Short Description

The members of a Private Group “Inliners” are having a group Chatting. One of them suggests an offline meeting, members agreed for the meeting. The administrator decides the time and place and then sends a message about the venue for the

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meeting. The administrator wants to let the members see the message easily, so he/she sets the IM font color to red and the font style as Underlined and sends the message. Members whose device supports font styles can see the red and underlined announcement message.

5.18.2 Actors

The Administrator of “Inliners” Group

Device A (which belongs to the Administrator)

Member B

Device B (which belongs to Member B and supports various font styles)

5.18.3 Pre-conditions

Device A and Device B supports various font styles (size, color and type) including underlined font type.

The Administrator and some members are in a Group Chatting. They decided to have an offline meeting and the members are waiting for an announcement message with the time and the place from the Administrator.

5.18.4 Post-conditions

Like Member B, the members whose devices support red and underlined font style can see this message as a rich (richer than plain) text.

5.18.5 Normal Flow

The Administrator decided the time and the place for the offline meeting.

The Administrator sets the font style as red and underlined.

The Administrator composes message containing the meeting details and sends to the group members in the chatting session.

Member B can see the red and underlined message from the Administrator.

5.18.6 Operational and Quality of Experience Requirements

1. The MIME type of the message is ‘text/plain’ to support font formatting.
2. IM client should support multiple font sizes.
3. IM client should support multiple colors.
4. IM client should support Bold, Italic and Underlined fonts

5.19 Use Case – Original Name of Multimedia Message in IM

5.19.1 Short Description

This use case describes the need to support the original name of a multimedia IM. UserA sends a picture “MeAndMickey.jpg” to UserB through IM. UserB receives the picture and wants to saves it. UserB opens “Save as…” dialogue box, and the original name “MeAndMickey.jpg” is suggested in the box. UserB checks “OK” and saves this picture.

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5.19.2 Actors

Actor	Description
UserA	A human user of the IMPS Service
UserB	A human user of the IMPS Service, whose IMPS User ID is known to UserA
ClientA	The terminal and software that UserA is using to access IMPS services.
ClientB	The terminal and software that UserB is using to access IMPS services.
Server	The server providing IMPS services

The addition of User and Client entities are here to facilitate distinction regarding profiling. A user is developing or has an existing profile whereas client is one of the ends in the serve – client communications.

5.19.3 Actor Specific Issues

Actor	Description
UserA	• Be able to communicate with UserB • Be able to send a multimedia IM • The Original Name of the multimedia IM is supported and transmitted
UserB	• Be able to communicate with UserA. • Be able to receive a multimedia IM • Be able to save the multimedia IM in the Original Name
Server	• To enable the users to communicate by means of instant messaging with the support of Original Name

5.19.4 Actor Specific Benefits

Actor	Benefit
UserA	• Is able to send the multimedia IM with the Original Name and communicate with UserB
UserB	• Is able to receive the multimedia IM with the Original Name and save it without re-typing the name
Server	• The number of communicating users increases, encouraging messaging traffic.

5.19.5 Pre-conditions

- UserA is a registered user of the IMPS service, logged in, and has negotiated IM functions (including blocking) using ClientA.
- UserB is a registered user of the IMPS service logged in, and has negotiated IM functions (including blocking) using ClientB.

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5.19.6 Post-conditions

- UserB has saved the multimedia IM in its Original Name.

5.19.7 Normal Flow

1. UserA sends a multimedia IM (e.g. a JPEG picture) with the Original Name to UserB.
2. The Server delivers the multimedia IM with the Original Name to UserB.
3. UserB receives and views the JPEG picture.
4. UserB tries to save this picture.
5. The Original Name of this picture is suggested in ClientB.
6. UserB saves the picture in the Original Name without re-typing it.

5.19.8 Alternative Flow

The alternative flow of the use case is that the UserB chooses a different name in saving the picture.

1. UserA sends a multimedia IM (e.g. a JPEG picture) with the Original Name to UserB.
2. The Server delivers the multimedia IM with the Original Name to UserB.
3. UserB receives and views the JPEG picture.
4. UserB tries to save this picture.
5. The Original Name of this picture is suggested in ClientB.
6. UserB decides to save it in another name, and types the name instead of the Original Name.
7. UserB saves the picture in the new name.

5.19.9 Operational and Quality of Experience Requirements

- The Client supports the original name of an IM.
- The Server supports the original name of an IM.

5.20 Open Issues

There are no open issues.

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6. High Level Feature and Function Requirements(Normative)

6.1 General Requirements

Ref	Use Case Title(s)	Requirements
GEN-1	Use Cases for Low memory clients	The protocol SHALL allow retrieval of long lists in parts. These lists include: • Contact lists, • Block/grant lists, • Group lists (joined users' list, access list, reject list), • Presence lists (authorization list, attribute list, presence update, watcher list)
GEN-2	Use Cases for Low memory clients	The mechanism to split long lists in parts SHALL be able to handle both uploads and downloads.
GEN-3	Use Cases for Low memory clients	It is NOT RECOMMENDED that the mechanism to split long lists in parts addresses instant messages.
GEN-4	Use Cases for Low memory clients	The mechanism to split long lists in parts SHALL address all transport bindings that OMA IMPS supports.
GEN-5		The server MAY limit the maximum size of text messages and rich content messages separately.
GEN-6		The server SHALL inform the client about message size limitations and about oversize message handling policies, such as: • No policy • Reject message • Deliver with extra charge.
GEN-7		The sender SHOULD be aware of the message size limitations and handling policies specified by the Service Provider(s) when sending a message. The Service Provider(s) SHOULD ensure that the system also takes account of the maximum size of the message, which can be supported by the recipient(s).
GEN-8		The server MAY restrict the content types that it accepts for delivery. Possible content types are those defined in the MMS Conformance Document [MMSCONF].
GEN-9		The server SHALL inform the client about the allowed content types.
GEN-10		The sender SHOULD be aware of the supported content types specified by the Service Provider when sending a message. The Service Provider(s) SHOULD ensure that the system also takes account of the content types, which are supported by the recipient(s).

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GEN-11	Use of multiple applications/sessions	Devices, Clients and 3APPs MAY be able to establish any number of separate sessions on any Server.
GEN-12	Use of multiple applications/sessions	Devices, Clients and 3APPs using separate sessions SHALL use different identification.
GEN-13	Use of multiple applications/sessions	Server SHALL NOT accept creating separate sessions from ClientIDs that are already in use in other sessions on a per user basis.
GEN-14	Use of multiple applications/sessions	Server SHALL accept creation of separate sessions from a unique ClientID that is not in use in any other session on a per user basis.
GEN-15	Use of multiple applications/sessions	Server SHALL NOT disconnect previous session(s) when a new session is established on a per user basis.
GEN-16	Use of multiple applications/sessions	Server MAY limit the number of concurrent sessions and deny establishing new sessions for this reason on a per user basis.
GEN-17	Use Case Auto-Registration	The IMPS system SHALL have a mechanism to determine whether the IMPS user has been registered in that specific service.
GEN-18	Use Case Auto-Registration	The IMPS server SHALL update the UserID upon registration into the client.
GEN-19	Use case Auto Login	The IMPS system MAY ignore User ID/password combination and authenticate the user based on MSISDN/MDN or other authentic network information. The UserID in the IMPS client SHALL be updated by the IMPS System at login, if the UserID in the IMPS client is incorrect.
GEN-20	Use case Auto Login	The IMPS system SHALL support bypass the Auto Login feature and force manual Login instead.

6.2 Security Requirements

Ref	Use Case Title(s)	Requirements
SEC-1	Use Cases for Low memory clients	The mechanism to split long lists in parts SHALL NOT create any security hole in the IMPS session.

6.3 Administration and configuration Requirements

Ref	Use Case Title(s)	Requirements
ADC-1	Use Cases for Low memory clients	The protocol SHALL allow the client to negotiate with the SAP the custom message size based on the client's memory size.

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6.4 Interoperability Requirements

Ref	Use Case Title(s)	Requirements
IOP-1	Use Cases for Low memory clients	The mechanism to split long lists in parts SHALL NOT create any interoperability issue in the IMPS protocols.

6.5 Privacy Requirements

Ref	Use Case Title(s)	Requirements
PRI-1		The IMPS system SHALL comply with the privacy requirements [PRIVACY].

6.6 System message Requirements

Ref	Use Case Title(s)	Requirements
SYM-1	Use Cases for System Message	The IMPS system SHALL support sending a System Message to the IMPS client.
SYM-2	Use Cases for System Message	The IMPS system SHOULD support a way to notify unsupported clients about the reason for denying access to the IMPS service.
SYM-3	Use Cases for System Message	The IMPS system SHOULD be able to identify unsupported client releases (e.g. outdated versions) by means of supported protocol and MAY deny access to the service.
SYM-4	Use Cases for System Message	The technical realization of system messages SHALL support none, one, or more answer options.
SYM-5	Use Cases for System Message	The technical realization of system messages SHALL support an answer option that requires a response from the IMPS client.
SYM-6	Use Cases for System Message	The IMPS system SHALL be able to block access to the IMPS service until the client has responded to the System Message if requested.
SYM-7	Use Cases for System Message	The IMPS system SHALL be able to send the System Message to the IMPS client before the client is logged in to the IMPS service.
SYM-8	Use Cases for System Message	The IMPS client SHALL be able to prompt to the end user with a System Message containing up to 128 characters.
SYM-9	Use Cases for System Message	The IMPS client SHOULD be able to prompt to the end user with a System Message containing up to 512 characters.
SYM-10	Use Cases for System Message	The IMPS client SHALL prompt the answer options to the end user for selection when the client receives the System Message.
SYM-11	Use Cases for System Message	The IMPS system SHALL be able to use the answer option from the IMPS client to decide which level of service is granted.
SYM-12	Use Cases for System Message	The IMPS system SHALL be able to resend the System Message.

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SYM-13	Use Cases for System Message	The IMPS client SHALL NOT be visible as online until the level of service has been negotiated.
SYM-14	Use Cases for System Message	The IMPS system SHALL support denying access to the service if no response is received to a System Message within a specific period (e.g. timeout). The time period is implementation specific.
SYM-15	Use Cases for System Message	The technical realization of system messages SHOULD support a way to make sure that the end-user has read and responded to the notification accordingly.
SYM-16	Use Cases for System Message	The technical realization of system messages SHOULD be optimized for mobile transports and SHOULD NOT introduce additional latency to the login sequence, except in the case when a System Message is sent.
SYM-17	Use Cases for System Message	The IMPS system SHOULD send System Messages (e.g. for AoC) to the IMPS client only in case of necessity (e.g. by first time use or if AoC needs to be re-negotiated).
SYM-18	Use Cases for System Message	Offline Message Notification SHALL NOT include any sensitive information (e.g. E.164 numbers, names, etc.).

6.7 Search Requirements

Ref	Use Case Title(s)	Requirements
SRC-1	Advanced search	The IMPS protocol search functionality SHALL be extended with basic logical relationships (AND, OR, NOT) as well as any level of nesting in the search criteria.
SRC-2	Advanced search	The new functionality SHALL NOT be a separate function – the original search transactions SHALL be extended – the elements in the current search transaction can be easily utilized to support both search models without defining new transactions.
SRC-3	Use Case Search By Contact Details	The IMPS search SHALL support the “Friendly Name” entry.
SRC-4	Use Case Search By Contact Details	As result of a user search the IMPS server SHALL only return the “User ID” and “Friendly Name”. The result for “Friendly Name” entry SHALL be returned only if it exists in the Public Profile of the user.

6.8 Instant Messaging Requirements

Ref	Use Case Title(s)	Requirements
IMR-1	Use Case: Sending an announcement in a chatting	The MIME type of the message SHALL be ‘text/plain’ to support font formatting.

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IMR-2	Use Case: Sending an announcement in a chatting	IMPS protocol SHOULD support multiple font sizes.
IMR-3	Use Case: Sending an announcement in a chatting	IMPS protocol SHOULD support multiple colors.
IMR-4	Use Case: Sending an announcement in a chatting	IMPS protocol SHOULD support Bold, Italic and Underlined fonts.
IMR-5	Use Case – Original Name of Multimedia Message in IM	If there is an original name associated with the multimedia content that will be sent in an IM, the protocol SHALL support transferring the original name of the multimedia content when the sender client is sending the IM.
IMR-6	Use Case – Original Name of Multimedia Message in IM	If an IM carries the original name of the multimedia content, the protocol SHALL support the original name of the multimedia content in the IM that the server accepts for delivery.
IMR-7	Use Case – Original Name of Multimedia Message in IM	If an IM carries the original name of the multimedia content, the protocol SHALL support the original name of the multimedia content in the IM at the recipient client delivered from the server.
IMR-8	Use Case Send where UserA is not on UserB's Contact List	The IMPS system SHALL identify sending users by both "User ID" and "Friendly Name". If "Friendly Name" does not exist, the IMPS system SHALL identify users by only the "User ID".
IMR-9	Use Case Send Instant Message (Offline)	The IMPS system SHOULD support reception of, storage of, and subsequent delivery of Instant Messages from logged-in sender users to the logged-out recipient users.
IMR-10	Use Case Send Instant Message (Offline)	The IMPS specifications SHALL specify the type of the off-line message notification for mechanisms such as SMS and WAP push.
IMR-11	Use Case Send Instant Message (Offline)	The recipient's home domain SHALL be responsible for sending off-line message notification. The use of this notification SHALL be optional for the operator.

6.9 Presence Requirements

Ref	Use Case Title(s)	Requirements
PRR-1		The IMPS system SHALL support withdrawal of authorization of presence information for more than one user at a time.

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PRR-2	Use Case Locate Friend and Show Map	The IMPS system SHOULD support retrieving location information of users as an image (map).
PRR-3	Use Case Locate Friend and Show Map	The image-based location information (map) SHALL be retrieved based on the existing GeoLocation presence attribute or User-ID.
PRR-4	Use Case Locate Friend and Show Map	If the image-based location (map) is requested based on User-ID, the IMPS server SHALL verify authorization of GeoLocation attribute for the requesting user, and based on that allow/deny sending the location information to the requesting user.
PRR-5		The IMPS server SHALL support both proactive and reactive authorization models.
PRR-6		The IMPS client SHALL support the proactive authorization model.
PRR-7		The IMPS client SHOULD support the reactive authorization model.

6.10 SSP user session management Requirements

Ref	Use Case Title(s)	Requirements
SUS-1	Use of Remote User Session Management	The IMPS system SHALL support user session management in a remote domain using the SSP protocol.
SUS-2	Use of Remote User Session Management	User Session Management SHALL include the following operations: • Login • Logout • Server Initiation Logout by the remote domain • Keep Alive • Get Service Provider Info • Service Negotiation
SUS-3	Use of Remote User Session Management	Get Service Provider Info operation SHALL be supported both inband and outband.

6.11 Private group conversation Requirements

Ref	Use Case Title(s)	Requirements
PGC-1	Use Case Extend IM to Private Group Conversation	The IMPS system SHALL support extending a one-to-one IM conversation to many-to-many Private Group Conversation.

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PGC-2	Use Case Extend IM to Private Group Conversation	The protocol SHALL allow the IMPS system to support silent and seamless transformation of IM to Private Group Conversation.
PGC-3	Use Case Extend IM to Private Group Conversation	The IMPS system SHOULD provide a seamless transfer from one-to-one IM to a Private Group conversation; users in the one-to-one conversation SHALL be notified of the addition of the other participant(s).
PGC-4	Use Case Extend IM to Private Group Conversation	The IMPS system SHALL NOT reveal any message history from the IM conversations prior to the users participation in the Private Group conversation.
PGC-5	Use Case Extend IM to Private Group Conversation	The IMPS system SHOULD notify the existing participants about new participants who join the Private Group Conversation.
PGC-6	Use Case Extend IM to Private Group Conversation	The Normative Requirements for participating in the Private Group Conversation SHALL be applied to the extended IM conversation.
PGC-7	Use Case Participate in Private Group Conversation	The IMPS system MAY support welcome message from the group creator or the inviting user.
PGC-8	Use Case Participate in Private Group Conversation	The IMPS system SHALL ensure that all participating users have the right to invite other users to join the Private Group Conversation.
PGC-9	Use Case Participate in Private Group Conversation	The IMPS system SHOULD only allow participation to users who have explicitly been invited to the Private Group Conversation.
PGC-10	Use Case Participate in Private Group Conversation	The IMPS system SHOULD ensure that neither group creator nor the participants have the right to expel other users in Private Group Conversation.
PGC-11	Use Case Participate in Private Group Conversation	The IMPS system SHOULD ensure that neither group creator nor the participants have the right to delete the group (thus terminating the Private Group Conversation).
PGC-12	Use Case Participate in Private Group Conversation	The IMPS system SHALL allow the server administrator to expel users.

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PGC-13	Use Case Participate in Private Group Conversation	The IMPS system SHOULD NOT allow private messaging within the scope of an active Private Group Conversation.
PGC-14	Use Case Participate in Private Group Conversation	A user participating/being invited to participate in a private group conversation SHALL be notified that another user he or she has blocked has joined/exists in the private group conversation.
PGC-15	Use Case Participate in Private Group Conversation	Privately established groups SHALL NOT be searchable in any way by other users.
PGC-16	Use Case Participate in Private Group Conversation	The IMPS system SHALL be able to allow users that unintentionally left the group, to rejoin it for a limited timeout period.
PGC-17	Use Case Participate in Private Group Conversation	The IMPS system SHALL NOT allow the users who have intentionally left the Group Conversation to re-join unless they are invited again by one of the participants.
PGC-18	Use Case Participate in Private Group Conversation	After the expiration of the above timeout period the IMPS system SHALL NOT allow the non-intentionally dropped-out user to rejoin the on-going Private Group Conversation unless he/she is re-invited by one of the participants. The timeout period is a server-specific value; see PGC-16.
PGC-19	Use Case Participate in Private Group Conversation	The IMPS system SHALL delete the group when all participants have left Private Group Conversation.
PGC-20	Use Case Participate in Private Group Conversation	If the “Screen Name” field is not unique the IMPS system SHALL create a unique “Screen Name” entry.
PGC-21	Use Case Participate in Private Group Conversation	The IMPS server SHALL notify the client about any changes in the “Screen Name” field.

6.12 Add contact Requirements

Ref	Use Case Title(s)	Requirements
ADC-1	Use Case Add Contact By IMPS User ID	If the User A does not provide a Nickname for the added User B, then the IMPS system SHALL automatically assume as Nickname either the User B’s Friendly Name, if present in the User B’s Public Profile, or by default the User B’s IMPS UserID.

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ADC-2	Use Case Add Contact By IMPS User ID	The IMPS system SHALL support adding user to the Contact List, Grant List, and authorizing online status in a single transaction.
ADC-3	Use Case Add Contact By IMPS User ID	The IMPS system SHALL support a mechanism to notify the User B that he/she is being added to user A's Contact List.

6.13 Public profile Requirements

<table>
<tr><th>Ref</th><th>Use Case Title(s)</th><th>Requirements</th></tr>
<tr><td>PPR-1</td><td>Use Case Add/Update Public Profile</td><td>The concept of Public Profile SHALL be introduced to the IMPS system with the following fields:
<table>
<tr><th>Field</th><th>Required</th><th>Searchable</th><th>Comment</th></tr>
<tr><td>Friendly Name</td><td>Mandatory</td><td>Yes</td><td></td></tr>
<tr><td>Age</td><td>Mandatory</td><td>Yes</td><td>Entered as year and month of birth, searched for by age</td></tr>
<tr><td>Gender</td><td>Optional</td><td>Yes</td><td></td></tr>
<tr><td>Intention</td><td>Optional</td><td>Yes</td><td></td></tr>
<tr><td>City</td><td>Optional</td><td>Yes</td><td></td></tr>
<tr><td>Country</td><td>Mandatory</td><td>Yes</td><td>Default to country of MSISDN</td></tr>
<tr><td>Free text</td><td>Optional</td><td>No</td><td></td></tr>
</table></td></tr>
<tr><td>PPR-2</td><td>Use Case Add/Update Public Profile</td><td>The IMPS system SHALL provide functionality to Retrieve, Update and Clear entirely the Public Profile.</td></tr>
<tr><td>PPR-3</td><td>Use Case Add/Update Public Profile</td><td>Clearing the Public Profile SHALL NOT clear the Friendly Name field.</td></tr>
<tr><td>PPR-4</td><td>Use Case Search by Public Profile</td><td>The IMPS system SHOULD provide functionality to Search for users based on their Public Profile.</td></tr>
<tr><td>PPR-5</td><td>Use Case Search by Public Profile</td><td>The existing IMPS Search mechanism SHALL be extended to support the Public Profile-based Search.</td></tr>
<tr><td>PPR-6</td><td>Use Case Search by Public Profile</td><td>The IMPS system SHOULD NOT allow searching based on Public Profile if the requesting user did not fill out the mandatory fields in his/her own profile.</td></tr>
<tr><td>PPR-7</td><td>Use Case Search by Public Profile</td><td>The IMPS server MAY send a system message to users who did not fill in the mandatory part of their Public Profile – explaining the consequences to privacy of filling the Public Profile.</td></tr>
<tr><td>PPR-8</td><td>Use Case Search by Public Profile</td><td>The IMPS system SHALL NOT include those users in a Public Profile-based search who did not fill out the mandatory fields in their own profiles.</td></tr>
</table>

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PPR-9		The IMPS server SHALL allow group administrators to specify a minimum age requirement for joining chat groups.
PPR-10		The IMPS server SHALL NOT allow those users that are under the age specified in the group properties to join the group.
PPR-11	Use Case Search by Public Profile	If an IMPS server has age restriction for searching based on the age field in the Public Profile, then the restricting server SHALL exclude those users - who are under the restricted age according to their Public Profile - from the search results.
PPR-12	Use Case Search by Public Profile	If Friendly Name exists in the Public Profile of the user then IMPS server SHALL include the Friendly Name with the User-IDs in the search results.
PPR-13	Use Case Search by Public Profile	The IMPS server SHALL accept only full strings (NOT sub-strings) in any searches that use Public Profile fields as search criteria.

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Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
N/A	N/A	No previous version within OMA.

A.2 Draft/Candidate Version 1.3 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-RD_IMPSDelta-V1_3	19 Feb 2004	All	Initial baseline proposal has been taken by the WG
	19 March 2004	All	First WG draft after cleaning up to typos and applying up-to-date template
	30 June 2004	All	Added the following approved contributions: OMA-REQ-2003-0584-IMPSLowMem_Req OMA-IM-2004-0101R01-ChangeRequest-Add-By-UserID-for-Delta OMA-IM-2004-0102R03-ChangeRequest-Add-By-MSISDN-for-Delta OMA-IM-2004-0103R02-ChangeRequest-Search-By-Contact-Details-for-Delta OMA-IM-2004-0104R03-ChangeRequest-Send-Message-where-UserB-is-not-on-Contact-List-for-Delta OMA-IM-2004-0105-ChangeRequest-Send-Offline-Message-for-Delta OMA-IM-2004-0106R02-ChangeRequest-Extend-IM-To-Group-for-Delta OMA-IM-2004-0107R01-ChangeRequest-Participate-In-Group-for-Delta OMA-IM-2004-0109R01-ChangeRequest-Add-Public-Profile-for-Delta OMA-IM-2004-0110R01-ChangeRequest-Search-By-Public-Profile-for-Delta OMA-IM-2004-0111R01-ChangeRequest-Locate-Friend-for-Delta OMA-IM-2004-0112R01-ChangeRequest-Auto-Registration-for-Delta OMA-IM-2004-0113R01-ChangeRequest-Auto-Login-for-Delta OMA-IM-2004-0168R02-CR_System-Message-UC-for-BCP
	30 August 2004	All	Added the following approved contributions: OMA-IM-2004-0123R01-13DeltaAdvSearch OMA-IM-2004-0124R03-LATE-13DeltaMultiApps OMA-IM-2004-0177R01-SSP-User-Session-Management OMA-IM-2004-0192R01-LATE-Editorial-changes-for-RD-IMPS-V1.3-20040630 OMA-IM-2004-0199-LATE-CR_Cancel-presence-authorization-of-multiple-users-for-Delta OMA-IM-2004-0200-LATE-CR-For-Incorporating-Content-Font-Formatting-in-IM OMA-IM-2004-0201R01-LATE-Add-by-user-ID-and-MSISN-clarification
	20 September 2004	All	Added the following approved contributions: OMA-IM-2004-0206R03-LATE-Messaging-Capability-Boundaries OMA-IM-2004-0216-Multimedia-IM-Origin-Name

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Document Identifier	Date	Sections	Description
	10 October 2004	All	Applied the new RD template. Re-ordered Abbreviations to alphabetic order. Approved all previous changes to make the document more readable and clean. Merged the System-message-related chapters (5.16, 5.17, 5.18, 5.19) into one chapter – 5.16, and added 'Common' chapter title. Merged the Low Memory Clients-related use cases into one chapter (5.1, 5.2, 5.3) an updated chapter titles as well. Corrected chapter title 6.5. Editorial changes – typo corrections. Added definitions for: "Friendly Name", "Public Profile", "Registration", and "System Message". Chapter 5.7 title corrected (switch UserA and UserB). Added the following approved contributions: OMA-IM-2004-0220R01-Normative-Requirements-for-Content-Font-Formatting-in-IM OMA-IM-2004-0221-LATE-CR_Normative-Requirements-for-Cancel-Presence-Authorization-of-Multiple-Users OMA-IM-2004-0222R01-13RDAlignNokia OMA-IM-2004-0238R01-Normative-Requirement-of-Multimedia-IM-Origin-Name OMA-IM-2004-0240R02-Normative-Req-for-Proactive-and-Reactive-Authorization OMA-IM-2004-0241R01-LATE-Normative-Req-IMPS-Delta-Auto-Registration OMA-IM-2004-0242R01-Normative-Requirements-for-SSP-User-Session-Management OMA-IM-2004-0243R01-LATE-Normative-Req-for-Auto-Login OMA-IM-2004-0247R02-Normative-Reqs-IMPS-Delta-Extend-IM-Private-Group OMA-IM-2004-0248R03-Normative-Reqs-IMPS-Delta-Participate-Private-Group-Conversation Spelling corrections to use cases and requirements.
	13 October 2004	All	Accepted all previous tracked changes to make the document more readable and clean. Added the following approved contributions: OMA-IM-2004-0250R01-Normative-Reqs-IMPS-Delta-Add-Contact OMA-IM-2004-0255R01-Normative-Reqs-IMPS-Delta-Search-Contact-Details OMA-IM-2004-0256R01-Normative-Reqs-IMPS-Delta-Send-UserB-not-on-UserA-Contact-List OMA-IM-2004-0257R01-Normative-Reqs-IMPS-Delta-Send-IM--Offline- OMA-IM-2004-0258R01-13RDAlign-PP_AGUCS OMA-IM-2004-0259R01-13RDAlign-FriendMap
	14 October 2004	All	Re-structured document into tables as requested by the REQ group. Added "or other authentic network information" to ALG-1. Changed "one-to-many" to "many-to-many" in PGC-1. Merged chapter 6.8 with 6.18 into a generic "Search Requirements" section. Merged chapter 6.9 into 6.1 General Requirements. Merged chapter 6.10, 6.12 and 6.19 into a generic "Instant Messaging Requirements" section. Merged chapter 6.11, 6.21 and the last three requirements from 6.1 into a generic "Presence Requirements" section. Merged chapter 6.13 and 6.15 into 6.1 General Requirements. Added definition of "Private Group Conversation".

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Document Identifier	Date	Sections	Description
	06 November 2004	All	Added approved contributions OMA-IM-2004-0268-Operational-Req-IMPS-1.3 OMA-IM-2004-0269-Add-MDN-def-to-IMPS-1.3-RD-Spec Online editing based on the comments in RDRR. RDRR document ID: OMA-RDRR_IMPSDelta-V1_3-20041106-D
	07 November 2004	All	Added approved contributions: OMA-IM-2004-0276R01-LATE-CR-Editorials-for-system-messages OMA-IM-2004-0278-CR-for-Private-Group-Conversation Online editing based on the comments in RDRR. RDRR document ID: OMA-RDRR_IMPSDelta-V1_3-20041107-D
Candidate Version OMA-RD_IMPSDelta-V1_3	18 Nov 2004	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2004-0393R01-IMPS13RD-RDRR

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