Push to Talk over Cellular Requirements

Version 1.0 – 29 Mar2005

Open Mobile Alliance

OMA-RD-PoC-V1_0-20050329-C

Contents

1. Scope (Informative)

This Requirement Document (RD) defines the requirements for the Push to Talk over Cellular. This document captures the overall service description, primarily from the service subscriber's and user's points of view, but its scope does not include the details of the human interface itself. The information contained in this RD is applicable to network operators, service providers and terminal and infrastructure manufacturers.

This RD contains the core requirements for the Push to Talk over Cellular enabler as specified by OMA. By means of this enabler, together with other OMA service enablers, a service provider SHALL be able to provide a complete service.

The term PoC in this document refers to the Push to Talk over Cellular enabler offered via an OMA compatible environment.

2. References

2.1 Normative References

[Privacy] OMA Privacy Requirements for Mobile Services: OMA-RD-Privacy-V1_0-20031001-D

http://www.openmobilealliance.org/ftp/PD/OMA-Privacy-V1_0_0-20031001-D.zip

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

[E.164] ITU-T Rec. E.164: The international public telecommunication numbering plan, 1997

2.2 Informative References

[PEEM] OMA Policy Evaluation, Enforcement and Management Requirements

URL: http://member.openmobilealliance.org/ftp/Public_documents/REQ/Permanent_documents/OMA-RD_Policy_Evaluation_Enforcement_Management-V1_0-20050112-C.zip

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

BER	Is the measured raw bit error rate for voice on the radio link.
Charging Data Record (CDR)	Record generated by a network element for the purpose of billing a subscriber for the provided service. It includes fields identifying the user, the session and the network elements as well as information on the network resources and services used to support a subscriber session. In the traditional circuit domain, CDR has been used to denote "Call Detail Record", which is subsumed by "Charging Data Record" as a generic term applicable to both circuit and packet switched networks.
Corporate PoC System	A system compliant with the OMA PoC specifications which is running in an Enterprise/Corporate Environment.
Floor Control	Mechanism for the arbitration of the sequence of PoC participants to speak.
Full Duplex	Media flow in both directions at the same time. Hence a user can speak and hear at the same time.
Half Duplex	Media flow in both directions between the network and the terminal, but only in one direction at a time. Media cannot flow in both directions at the same time. Hence a user cannot speak and hear at the same time.
PoC Administrator	A person(s) or an entity that creates and maintains relevant aspects of PoC service for a specific PoC subscriber or group of subscribers. The PoC service provider is the default PoC administrator. PoC administrative rights may be assigned to a representative of a group of subscribers (e.g. IT department of a corporation, or a VAS provider) for the sole purpose of administering PoC service within that subscriber group
PoC Group	A defined set of PoC participants amongst whom a PoC session may take place or who may participate in a chat PoC group session.
PoC Group Administrator	A person(s) or entity who has the authority to define, delete or modify PoC group memberships (i.e. administrative rights for group membership management are exercised in an “off-line” fashion). The PoC service provider has group administrative rights by default. PoC Group administrative rights may be assigned by the service provider to a PoC subscriber or his representative (e.g. IT department in a corporation) as part of the service provisioning, or assigned by the PoC Host to a group session participant temporarily. The PoC Group administrator may be a participant in all, some or none of the PoC group sessions. PoC Group Administrator is a special case of PoC Administrator.
PoC Host	A PoC participant who has authority to initiate and administrate an active group session (i.e. group administrative rights in a PoC session are exercised in an “on-line” fashion). The service provider has PoC Host administrative rights by default, subject to applicable privacy rules. **Note:** Open PoC chat groups can be joined by any PoC subscribers and may not require any PoC hosts.
PoC group member	PoC subscriber who has been added to a PoC group through an administrative action.
PoC Participant	A PoC subscriber who is participating in a PoC session.
PoC Client	An entity that realises capabilities to support the PoC Service Enabler from a client perspective.
PoC session	This is an established connection between PoC subscribers where PoC participants can communicate using voice one at a time. Note: PoC Session has technical implications related to connectivity resources in the mobile network, design of the PoC service entity and PoC client etc. This term is used throughout the Normative chapters in this document. ‘PoC session’ corresponds to ‘PoC call’ which is used in

	an ordinary sense.
PoC call	This is a term more suited for ordinary use which describes the PoC service experience from an end user perspective. This term is only used in the Informative chapters in this document.
PoC Service Enabler	Allows Push-to-Talk application by a half-duplex form of communication whereby one participant communicates with other(s). The PoC Service Enabler utilise UMTS and CDMA packet switched networks.
PoC Service Entity	Realize capabilities to support the PoC Service Enabler.
PoC subscriber	A subscriber whose service subscription includes the PoC service.
Service provider	A Service Provider is either a network operator or an other entity that provides services to a subscriber (e.g. a MVNO).
Subscriber	A network operator subscriber who may be the candidate to be a PoC service participant.
Talk-Burst	Communication transmitted when a participant invokes a PoC session and speaks after being granted permission and until he releases the PoC session function.

3.3 Abbreviations

PoC/POC	Push to Talk over Cellular
PTT	Push to Talk
MOS	Mean Opinion Score
BER	Bit Error Ratio
UE	User Equipment

4. Introduction (Informative)

Push To Talk over Cellular (PoC) service is a *two-way form* of communications that allows users to engage in immediate communication with one or more users. POC service is similar to a "walkie-talkie" application where a user presses a button to talk with an individual user or broadcast to a group of participants. The receiving participants hear the sender's voice either without any action on their part, for example, without having to answer the call or may be notified and has to accept the call before he can hear the sender's voice. Other participants can respond to this message once this initial speech is complete. The communication is half-duplex, that is to say, at most one person can talk at a time and all other participants hear the speech. This contrasts with voice calls, which are full duplex, where more than one person can talk at a time.

The PoC service enabler has an inherent data orientation beyond simple voice. With its strong coupling to data capabilities, other key features similar to data messaging services are also supported, such as: Group lists creation & management, Group sessions emulating conferencing on demand and, possibly, other features enabled by user Presence & Availability information.

A number of Push to Talk services and their supporting equipment have already been seen in the market. However, to date, these services and the products are all proprietary in nature. In order to avoid market fragmentation and enable wide industry interoperability, a common standard defining service in sufficient detail to allow inter-working among different vendors equipment is needed.

OMA has undertaken this challenge to define a set of specifications that enable the service providers to offer this service to their subscribers, starting from the service requirements. Hence, this document contains the requirements of the Push to Talk over Cellular (PoC) service enabler.

The PoC service enabler may support a 1-to-1 communication feature, a 1-to-many communication feature and a personal alert feature.

- The 1-to-1-communication feature is the basic capability for setting up voice communication between two users. The voice communication attempt may either be accepted automatically or manually answered by the invited subscriber.
- The 1-to-many communication feature enables a subscriber to set-up a voice communication with a multiple number of other subscribers, where the participant speaks one at a time.
- The personal alert feature enables a subscriber to alert another subscriber. The alert expresses the calling subscriber's wish to communicate and to request the invited subscriber to "call back".

The document first captures the use cases describing the service requirements from the point of view of the end users and other actors, and then states the service enabler requirements, in the subsequent chapter, which are derived from these use cases.

4.1 User Experience

In the following figure 1, an end user with a PoC enabled device is illustrated interacting with a PoC service provider in order to participate in 1-to-1 and 1-to-many PoC calls.

The participation in PoC sessions is only permitted once the user has applied for and been granted a subscription to access PoC services. The user can then participate in PoC sessions, either with another PoC user or with-a PoC group. As a PoC participant, the user can participate as a member of more than one group at a time

The PoC service enabler supports advanced Group Lists creation & management capabilities and PoC group session. The user should be able to create and manage PoC group lists either using a terminal or a web page. Additionally, a participant in a PoC session is called a PoC Host when he has the ability to execute capabilities such as the following: remove & block subscribers as a result misusing - for example - a PoC session, granting administrative rights to another PoC Participant; and creating a chat group into which subscribers can register themselves.

The user is able to receive notifications of PoC groups available to participate in and hence request to join those groups, or he may receive invitations to participate in other PoC groups. he is able to identify which group he is participating in and

retrieve a list of PoC group members participating in each group. Changes to group status are propagated to the PoC participants, such as when a new user joins a group or when an existing user leaves a group.

As PoC subscribers can be subjected to potentially intrusive communications, mechanisms are provided to allow the Called Party to either accept or reject incoming PoC call alerts requesting a PoC session by another user or group.

In addition, Reject lists can be set up by the user to block potential spamming situations, including:

- Repetitive unwanted incoming requests for PoC sessions.

Similarly, Accept lists can be set up by the PoC subscriber to always accept incoming calls from specific PoC subscribers or PoC groups with:

- Automatic Answer (voice reception is instantaneous, no recipient action required), or
- Manual Answer mode (requiring recipient action).

Subject to privacy settings of the other participants, the PoC participant can also be notified of the status of on-going PoC sessions, such as the arrival of new PoC participants.

Once the PoC participant requests to speak and is granted the right to speak, the other PoC participant(s) in the PoC session can listen without further action.

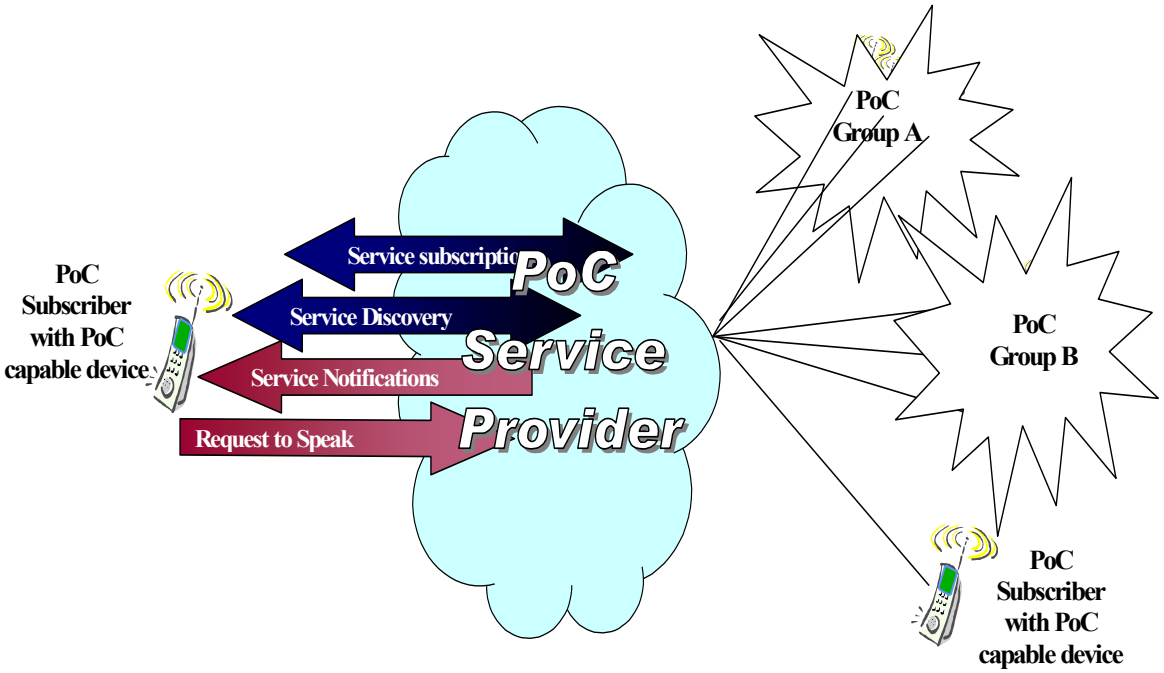


Figure 1: Basic User Experience

Note: the "PoC service provider" cloud may include multiple PoC service providers.

5. Use Cases (Informative)

The following are a collection of PoC use cases that are considered to represent a good basis for requirements derivation.

5.1 Use Case A, "*SHOPPING LIKE CRAZY*"

5.1.1 Short Description

This subclause provides the prose description of the basic PoC service from the beginning to the end.

- A group of people shopping together decided to keep in touch with each other using a PoC service to inform on the most challenging bargains. Therefore, one of them, Mary, requests the PoC service provider to set-up the PoC service for them.
- As soon as the PoC service provider has set up the service, all the invited people get an indication on their terminal, asking whether they would accept the service. This service invitation contains the name of the inviting host (Mary) as well as the name of the group: "*SHOPPING LIKE CRAZY*". In addition, the PoC service provider has relayed the right to accept additional participants to Mary.
- Most of the invited people accept the service offer, becoming participants in the PoC group. However some do not accept, since they have other preferences.
- In the department store they meet another friend who would like to join. Being given the name of the group he sends a request to Mary to join the group. Mary allows him to join.
- Susie suddenly discovers an extremely cheap shoe shop, which she simply has to tell her friends of. So she pushes the talk button.
- As someone is speaking right now and Manfred had pushed the button before, Susie's request to speak is queued.
- Hearing Manfred talk, Susie realizes that Manfred is already talking about this shoe shop. So she cancels her request to speak. Alternatively, after Manfred had finished speaking, Susie would have received an indication, that she is now "*on air*".
- The voice is immediately distributed to the other participants. For the listeners, when they are ready to listen, their terminals receive the voice of the speaker without prior indication.
- One of the participants receives an incoming phone call. As determined by the preferences of the owner, the phone switches to "*not ready to listen*" mode of the PoC service. In this mode the PoC service silently continues in the background, after the end of the phone call the participant decides to return to listening to the PoC service.
- After a while Manfred gets bored with all this gossip and decides to leave the PoC group. He simply sends the unregister-request indication to the PoC service. The rest of the participants get an indication that Manfred has left the PoC group.

5.1.2 Actors

- PoC Participants: Susie, Manfred and others are acting as participants.
- PoC Host: Mary is acting as the host:
- PoC Group Member: PoC Subscriber who has been added to the group, may or may not be PoC Participant
- Service provider

5.1.2.1 Actor Specific Issues

PoC Participants

- Want to be able to communicate quickly using voice
- Want easy to use handsets
- Want good voice quality

PoC Host:

- Want to be able to control the PoC group

Service Provider

- Wants to attract corporate customers to new infrastructure
- Wants to maximise potential for VoIP services

5.1.2.2 Actor Specific Benefits

PoC Participants:

- Increased productivity
- Ease and speed of placing voice calls

PoC Host

- Takes authority to control and administer the PoC group

Service Provider

- Takes revenue from PoC voice calls

5.1.3 Pre-conditions

All PoC group participants are enabled to use the PoC service and using PoC compatible terminals with PoC client.

All PoC group participants have connectivity to PoC Service Provider.

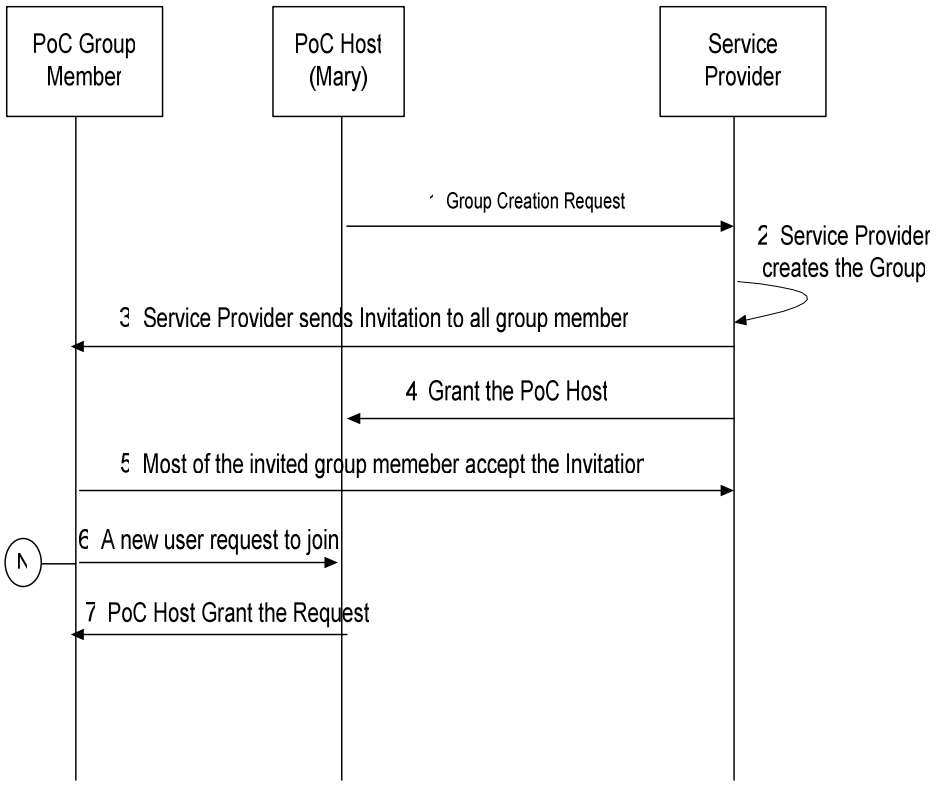
5.1.4 Post-conditions

When the group came to an end, the administrator may unregister all the participants and stop the service for this group. For another group, there is their PoC service running, but, as all the participants have left the service, the administrator may decide to terminate the service. In the both cases, the administrators give back their authority to the PoC service provider.

5.1.5 Normal Flow

The following flow provides the prose description of the PoC group creation by a PoC subscriber.

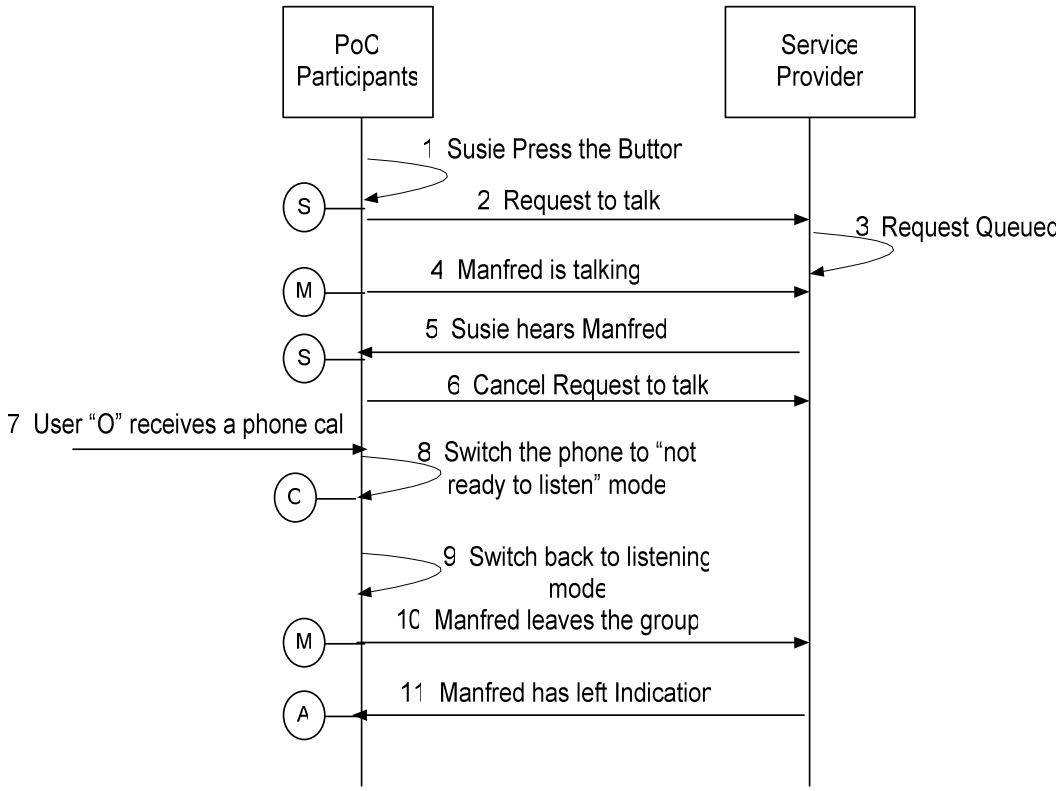
1. A PoC subscriber (Mary) sends a request to create a PoC Group to the Service Provider.
2. Service Provider creates the group according to the request.
3. Service Provider advertises the PoC group to all the invited group members with the group name and the PoC Host for the group.
4. The Service Provider grants part of the administrative authority to requestor (Mary), so that the requestor becomes PoC Host.
5. Most of the invited group members accept the invitation and become PoC Participant of the group.
6. A new user send a request to PoC Host to join the group
7. PoC Host grants the request to join.



PoC Group Creation

The following flow provides the prose description of the basic PoC service when the subscriber starts speaking and listening.

1. A participant pushes the talk button to request that she would like to speak.
2. The request to talk indication is sent to the service provider.
3. The network recognises the request by the user and puts the request in a queue since another participant in the group is talking.
4. The other participant speaks.
5. The speaking is delivered to other PoC participants in the same group.
6. The requestor hears the other participant's speech and decides to cancel her request.
7. Another participant in the group receives a circuit-switched phone call.
8. The participant set his PoC configuration to "not ready to listen" mode.
9. After finishing the CS call, the participant switches his PoC configuration back to listening mode.
10. Another participant decides to leave the group.
11. All the other participants in the group receive an indication that this participant has left the group.



PoC Group talk

5.1.6 Operational and Quality of Experience Requirements

The request-response time by the network and the distribution of the voice message shall be short enough so as not to irritate the users when the users take action to speak and to listen.

5.2 Use Case B, easy launch PoC service

5.2.1 Short Description

The PoC application can be launched by a user from his terminal in a very efficient and simple way.

5.2.2 Actors

- Participants: Cindy is acting as participants.
- Host: Tom is acting as the host.
- Network operator. A network operator is the organisation, which provides the facility of the telecommunication to the users (subscribers). The network operator is going to provide the users with the Push to Talk service making use of the facility.
- Service provider. A PoC service may, according to the configuration of the network operator, provided by the service provider whose body is different from the network operator. The service is offered through the network operator. Note that, in this sub clause, the distinction between the network operator and the service provider may not be well considered.

5.2.2.1 Actor Specific Issues

Participants

- Want easy to use PoC set up procedure
- Want to add additional information to the active PoC participants, if available

5.2.2.2 Actor Specific Benefits

Host Tom

- Gets additional presence information regarding other Takes authority to control and administer the PoC group

5.2.3 Pre-conditions

In the optional case presence information is used, it is assumed that Tom has rights to view Cindy's presence information and Cindy has presence information available.

Tom's terminal is enabled with additional PoC starting facilities for very easy PoC use.

All PoC group participants are enabled to use the PoC service and using PoC compatible terminals.

5.2.4 Post-conditions

Tom stays up to date with Cindy's presence information.

5.2.5 Normal Flow

- Tom selects his address book, and from the list of his contacts, he may launch immediately a PoC session via an appropriate menu item in the address book. Tom may be also given the opportunity to add further recipients after having selected Cindy as the first one.
- Optionally, the address book could have been updated automatically with presence information from Cindy; if this information is granted to Tom

5.2.6 Alternative Flow

- An alternative way for Tom to launch a PoC application is by doing it via a dedicated menu entry on the mobile phone's GUI. After launching the application, the user gets his list of participants (buddy list). If feasible, this list could be identical with the address book, with extra presence information where applicable.
- The user should be given the option to launch the application automatically after switching on the terminal. In this case, an IMS registration will be done in the background, ensuring more rapid access to the service.
- It must also be possible for the network to launch the PoC application, in case e.g. of an incoming PoC message or PoC session invitation and in case the PoC application is not yet running. Launching the application must work both in the case of an existing or a non-existing bearer session with the user. In case a bearer session has not yet been activated, the user shall be asked to approve the bearer session activation.

5.3 Use Case C: basic user interactions with a PoC terminal

5.3.1 Short Description

In this scenario a PoC user initiates a PoC call to his colleague by pressing a button on his PoC terminal. A system tone informs the user that system resources have been established for his call. The called party (his colleague) can hear the caller's voice on their terminals without a need to answer.

5.3.2 Actors

Participants: Company employees, Alan and Bill

Network Operator

5.3.2.1 Actor Specific Issues

Company employees

- Want to be able to communicate quickly using voice
- Want easy to use handsets
- Want good voice quality

Network Operator

- Wants to attract corporate customers to new infrastructure
- Wants to maximise potential for VoIP services

5.3.2.2 Actor Specific Benefits

Company employees

- Increased productivity
- Ease and speed of placing calls

Network Operator

- Takes revenue from PoC calls

5.3.3 Pre-conditions

Alan and Bill have PoC capable terminals and PoC service subscriptions.

5.3.4 Post-conditions

Alan and Bill complete their PoC voice communication and end their PoC session

5.3.5 Normal Flow

Alan and Bill are employees of the same company – a furniture warehouse. Alan works on the warehouse floor and needs to contact his product manager, Bill who works in a different location in the warehouse, to check when the next shipment of a range of chairs will arrive.

1. Alan first chooses the target PoC user that the voice communication will be directed to by scrolling through the list of supported PoC groups and other PoC users that Alan has defined. He finds “Bill – Product Manager”.
2. Alan presses the “Push To Talk” button in order to talk to Bill. An indication on Alan’s device (in this example, a confirmation tone) informs Alan that the connection to the PoC system has been set-up; it does NOT necessarily imply that the target user is receiving the voice communication.
3. Alan speaks into his handset and then releases the “Push To Talk” button, and listens for a response from Bill
4. Bill picks up Alan’s voice from his handset speakerphone. He presses the “Push To Talk”, button on his handset and awaits an indication (in this example a confirmation tone) prior to speaking.
5. This exchange goes on until Alan confirms with Bill the shipment delivery schedule he was after.

6. Alan returns to his PC and updates his records according to Bill's information

7. After a timeout period of inactivity, Alan and Bill's handsets indicate the end of the session (in this example by generating a short tone and displaying the message "*BYE*").

8. Bill notices that he forgot to mention to Alan about the quantity of the next shipment and he presses the "Push To Talk" button on his handset. Alan's name, being the last PoC group or other PoC user that Bill had a PoC session with stays as the default on the display.

5.3.6 Alternative Flow

As an alternative to step 2 and 4 above, Alan/Bill starts talking immediately after pressing the "Push-to-Talk" button, (i.e. without waiting for an indication to talk).

5.3.7 Operational and Quality of Experience Requirements

- PoC terminals shall be expected to support a physical button that causes an event both when pressed and a separate event when released. This button may be shared with other applications, i.e. it does not have to be a dedicated button exclusively used for PoC.
- PoC terminals should support the capability to scroll through a list displayed on the screen, allow the user to select displayed entities, and shall be able to interoperate with the physical button designated as the PoC button.
- A PoC capable terminals should support the capability to produce audio tones, e.g., to indicate a new PoC call has arrived or an error has occurred
- In-call messages, e.g., tones, system's greetings and other messages, shall be possible during a PoC session.
- Each PoC user should be identified by an alphanumeric string on the handset.
- The last PoC group or other PoC user with which the PoC user had a PoC session should remain as the default on the display of the PoC terminal after the session has ended.
- The PoC capable terminal should have a speaker in addition to the earpiece and provide a button for the user to toggle between the two.
- PoC voice calls shall be encrypted
- The request-response time when first establishing a PoC call may be longer than the time taken between listening and talking during an active PoC voice session

5.4 Use Case D, Basic Use Case, "Where to eat"

This is a basic use case, which describes the PoC group call feature. In the example one group member (Julie) initiates a group call by selecting the appropriate group from her PoC terminal and starts talking to other group members. Other members can hear the speech from their terminals without a need to answer. Other group members can take part in the conversation by pressing the POC button and waiting for a permission to speak

5.4.1 Short Description

- Julie wants to have lunch with her workmates and she makes a call to them using PoC.
- She queries whether they would like to go to city, as she is not very fond of the menu at the nearby restaurant where they usually eat.
- Julie first selects the group of people she wants to talk to and presses the Push to talk button.
- After a short while the PoC server will send her a permission to speak notification and she can start talking to the group and all the people in the group will hear her.
- Everybody in the group agrees that the menu at the local restaurant is not very attractive and they reply one-by-one to the group that they agree and would like to go to the city with Julie.

5.4.2 Actors

Primary actors:

Participant: Julie and her workmates from the same company.

5.4.3 Pre-conditions

All parties have PoC capable terminals and PoC service subscriptions.

5.4.4 Post-conditions

Julie has conveyed her message to all parties and they have replied to Julie. All parties have heard all the replies. The group session is still open for further group communications.

5.4.5 Normal Flow

Julie selects the Push to talk application and opens it. There is no group currently active and Julie creates one by selecting the people she wants to talk to from the phonebook in her terminal. She presses POC button and a PoC request is sent to all parties. Julie is given the permission to speak when the first party accepts the request. After that all parties that accept the request are automatically joined to the PoC group session and everybody can just push and talk, and no further notifications are sent. Other members can request a reply turn by pressing the POC button. After Julie releases the POC button the first requester is given the permission to speak, others will hear the voice of the first requester.

5.4.6 Alternative Flows

Outward ad hoc group

There is no group currently active and Julie creates one by selecting the people she wants to talk to from the phonebook in her terminal. She presses POC button and a PoC request is sent to all parties. All parties need to answer the request before Julie is given the permission to speak. After the initial PoC call creation everybody can just push and talk, and no further notifications are sent.

Inward ad hoc group

There is no group currently active and Julie creates one by creating a name to the group and selecting the people she wants to talk to from the phonebook in her terminal. She sends an invitation to the selected people and joins the group she created. Julie is given the permission to speak right after the group is created. When the selected people receive the group information, they can join the group and start using the service immediately. No notifications or alarms are sent after the invitation to join.

Inward permanent group

There is a previously defined “workmates” group and Julie joins it. She is given the permission to speak right after she has joined the group. All people that are active in the group will hear her speak without any notification.

5.5 Use Case E, Private Call - One-to-One

5.5.1 Short Description

Private call is a half-duplex dispatch audio communications between two subscribers. Allows two users to communicate via Push to Talk (POC) dispatch voice service. A user initiates a private call by selecting/specifying a target mobile subscriber and pushing the Push To Talk (POC) button on the phone. Only one user may speak at a time, arbitrated by the network. The POC Private Calls are typically of much shorter duration than a typical telephony call, and is characterized as having rapid set-up (compared to telephony) and short duration.

5.5.2 Actors

- Participants: Alice and Bob. Alice wishes to call Bob in a one-to-one private call, asking Bob if he set-up a technical review meeting.
- Host: In this case, Alice is the invoker of the Private Call.
- Network operator
- Service provider.

5.5.2.1 Actor Specific Issues

Participants

- Want to be able to quickly communicate using voice.
- Want easy to use handsets, with fast methods of selecting users and initiating a call.
- Want to know apriori that the user is reachable before the call.
- Want reasonably good voice quality.

Network Operator:

- Wants to attract customers to new service.
- Wants to reduce subscriber churn to other network Operator.
- Wants to maximise potential for VoIP services, offering new revenue generating service.

5.5.2.2 Actor Specific Benefits

Participants

- Better productivity – PoC calls are of quick duration, and gets users back to more productive tasks (vs. waiting for calls, or participating in calls that typically last longer than PoC calls).
- Ease and speed of placing PoC voice calls.

Network Operator

- Takes revenue from PoC voice calls.

5.5.3 Pre-conditions

Alice and Bob have PoC capable terminals and service subscriptions, and have powered-on their phones. Their PoC phones have registered with the network for PoC service. The handsets have provided presence information about Alice and Bob to the network (either automatically, or upon Alice or Bob's interaction with the handset).

The mechanisms for synchronizing the contact lists between the handset and the server are outside the scope of this use case.

5.5.4 Post-conditions

Alice and Bob have finished their Private Call voice call and ended their session.

5.5.5 Normal Flow

To begin a POC session, the Alice selects Bob's name from her contact list. Alice notices in her contact list that Bob's presence status is "online", which indicates with high probability that Bob is reachable. Once the number has been selected by Alice (or keyed into the handset), she presses and holds the "POC" button/key, indicating to the network that she would

like to speak. Alice hears a talk-proceed-tone, to indicate that she can now begin to speak. Alice now speaks and the person being called, Bob, hears a tone to announce the incoming private call, and then hears Alice talking from his handset. When Alice is done speaking, her "POC" button is released, and Bob hears a "floor open" tone to indicate that he may now reply. Bob is now able to press and hold the "POC" button/key, hears the talk-proceed-tone, and begins to speak. The conversation would continue in this back and forth manner.

If the listening party presses the "POC" button while the talking party has their "POC" button depressed, the listening party hears a rejection or waiting tone to indicate that it is not yet their turn to speak.

The flow of a call is as follows:

Alice: Presses and holds the "POC" button, hears the "talk-proceed" tone and speaks,

Bob: Hears the "incoming call" tone and hears Alice speaking

Alice: Releases the "POC" button

Bob: Hears the "floor is available" tone, presses and holds the "POC" button, hears the "talk-proceed" tone and speaks

Alice: Hears Bob speaking

The conversation would continue in this back and forth manner. When the parties conclude their discussion, they stop talking, and stop pressing their respective "POC" buttons. After a period of time of inactivity, the network will determine there is no activity, and automatically hang-up the session.

5.5.6 Alternative Flow

A number of alternative flows or methods exist for this private call;

- Method to select the called party - Alice may select Bob from the contact list as in the normal flow above, or may directly enter a number or handle through the handset keypad. Also, Alice may choose to select Bob from a recent call list, either received calls or dialled calls.

- Quick Key – Upon selecting the party to be called, Alice may quickly press and release the POC button. This has the effect of setting up the call with the target users, but immediately releases the floor once the call is established. Once the call is established, either Alice or Bob may request the floor. This method provides a "polite" technique of notifying the target, in this case Bob, that Alice would like to communicate, without having speech play out on Bob's handset.

- Call Termination – When Alice is finished with the call; she may press a key on the handset that ends the call. Bob would receive a notification on his handset that the call is terminated. This would end the call and release the session more quickly than the session being timed-out by the network.

- Invite Based Call Treatment - Bob may have his handset configured for an invitation mode, in order to prevent speech from immediately coming out of his handset. This would cause Bob's handset to be notified that there is an incoming call, and he could choose to accept it or not (similar fashion to a telephony call). When Alice presses the POC button, instead of immediately receiving a talk-proceed-tone, she would get a notice that the system is waiting for Bob to accept the call. When Bob finally accepts the call, Alice will receive a talk-proceed-tone. If Bob does not accept the call, she would get a call-rejected notification.

- Do not disturb – If Bob does not want to be bothered for POC calls, Bob may configure his phone into a "do not disturb" mode. This would cause calls from anyone (Alice) to be automatically rejected.

- Presence Status Override - If on Alice's contact list, presence status for Bob is "unknown" (as opposed to "off-line", which means he is unreachable), Alice may attempt a call even though Bob's status is unsure. This is a possible situation under the condition that only a subset of contacts in Alice's contact list have been tagged to request presence updates. This tagging for updates may be done to reduce the network load required for presence updates. In this example, if Alice has 200 contacts in her list, perhaps only 10 people would be tagged to request presence updates. The other 190 people would have presence listed as "unknown" in her contact list, but Alice could still attempt calls to those people in spite of their unknown status.

- In call status – Alice can get a "User Busy" or "Unavailable" if a target user is already in engaged in a Private or Group Call. Alice may also get directed to leave a POC voice message, which will be enquired by the network for later playback for Bob.
- Call attempt failure – If Alice attempts to make a POC call to someone who is not available, and a mechanism has not been activated which enables Alice to leave a message, then after an appropriate alerting period the call attempt should terminate. Alice should be made aware of the reason for the call attempt termination and a mechanism should exist so that it is possible not to charge Alice for making the call attempt.
-

5.5.7 Operational and Quality of Experience Requirements

PoC Terminals should support the following (as a minimum):

- The terminals should support functions to setup the call, request the floor, and release the floor. *This does not need to be a dedicated button, although this will improve the user perception if available. The terminal should have separate buttons to manually exit the call.*
- The terminals should support distinct comfort tones to announce an incoming call, and to properly arbitrate the use of the half duplex service (talk-proceed, floor open, floor rejected).
- A "High Audio" speakerphone should be supported, *allowing for a walkie-talkie form of experience*.
- A contact list allowing for easy selection of the target users should be supported, as well as recent call lists.
- *Presence information should be available for all or a subset of users in the contact list.*
- Caller ID information must be provided to both parties of the private call.
- Visual indicators (in addition to the audio tones) should be provided, indicating if a user is in a call, if the user has the floor, or if the other participant has the floor.
- The initial call setup (first "POC") exchange can take longer than subsequent POC setups in the same session.

5.6 Use Case F, Call Alert – One-to-One

5.6.1 Short Description

The Call Alert function is one that allows a user to "ping" each other, indicating that one user wishes to communicate with another user. Call Alerts are often used in conjunction with Private Calls, and are used as a polite method of letting the target of the call know that the originator wishes to talk (instead of having speech immediately coming out of the handset as in a Private Call). It is also similar to a Quick Key method as described in the Private Call use case. The Call Alert provides a notification to the target of the calling party, and the target may immediately hit their POC key to Private Call back to the originator. The Call Alert may optionally carry text or other media to from the originator to the target.

5.6.2 Actors

- Participants: Alice and Bob. Alice wishes to Call Alert Bob, in order to invite Bob to Private Call.
- Host: In this case, Alice is the invoker of the Call Alert.
- Network operator.
- Service provider

5.6.2.1 Actor Specific Issues

Participants

- Want to politely or discretely notify a target user that the originator wishes to communicate.
- Users want to respond quickly communicate using voice.
- Want easy to use handsets, with fast methods of selecting users and initiating a call.
- Want to know apriori that the user is reachable before the call.
- Want reasonably good voice quality.

Network Provider

- Wants to attract customers to new service.
- Wants to reduce subscriber churn to other network providers.
- Wants to maximise potential for VoIP services, offering new revenue generating service.

5.6.2.2 Actor Specific Benefits

Participants

- Politeness or discrete calling capability. A "white collar" market feature. Call Alert leads to engaging in a Private Call.
- Better productivity – PoC calls are of quick duration, and gets users back to more productive tasks (vs. waiting for calls, or participating in calls that typically last longer than PoC calls).
- Ease and speed of placing PoC voice calls.

Network Provider

- Takes revenue from PoC Call Alerts, or expect that Call Alerts lead to Private Calls, which are charged.

5.6.3 Pre-conditions

Alice and Bob have PoC capable terminals and service subscriptions, and have powered-on their phones. Their PoC phones have registered with the network for PoC service. The handsets have provided presence information about Alice and Bob to the network (either automatically, or upon Alice or Bob's interaction with the handset).

5.6.4 Post-conditions

Alice has Call Alerted (notified) Bob that she wishes to be contacted. Bob and Alice are active on their respective networks. Bob's handset is configured to rapidly engage in a Private Call. This active configuration will persist for a period of time, after which Bob's handset will restore itself back to a non-Alerted mode of operation.

5.6.5 Normal Flow

Alice may also choose to " Call Alert" Bob as opposed to using the "Private Call" technique illustrated previously. To Call Alert someone, Alice selects a contact from the contact list. Instead of immediately pressing the "POC" button as in the Private Call scenario, Alice selects the "Alert" option (a button on the handset User Interface). Instead of pressing and holding the "POC" button and speaking, Alice presses and releases the "Call Alert" soft key. This sends a signal to the handset of Bob. Bob hears the Call Alert tone (or vibration), and may respond by pressing and holding the "POC" button to initiate a Private Call conversation with Alice. Alice's name or PoC number/URI is displayed on Bob's handset via Caller ID format.

A Call Alert allows Bob to choose his action based on his environment, and his ability to respond and engage Alice in voice communication. Bob may need to exit a meeting, or restaurant in order to participate in the POC session. Call Alert allows Bob the flexibility engage the POC call at an acceptable time, especially if the Private Calls use the speakerphone, which can be disruptive.

5.6.6 Alternative Flow

- Method to select the called party - Alice may select Bob from the contact list as in the normal flow above, or may directly enter a number or handle through the handset keypad. Also, Alice may choose to select Bob from a recent call list, either received calls or dialled calls.

- Method of Invoking an Alert – In the example above, Alice selected the Alert option which immediately sent the call alert to Bob. Other methods may be considered, such highlighting a user in the contact list, selecting the Call Alert option, and then toggle the "POC" key to actually send the Call Alert. This would be similar to a Quick Key method described in the Private Call section, except that the alert notification would be persistent for a period of time on the Bob's handset.

- Call Alert Rejection Options - Upon receiving a Call Alert, Bob has multiple options. Examples…

    - Bob can immediately push the POC button, and enter a Private Call back to Alice. After a period of time, this Call Alert notify may go away, putting the handset back into a nominal non-Alerted mode of operation.

    - He can ignore the Call Alert. The notification could stay persistent on the handset for a period of time, allowing for a later callback if Bob was away from his handset.

    - Select an option that will have the handset automatically invoke Instant Messaging Application back to Alice, allowing Bob to send Alice canned messages such as "Can't Talk Now" or allowing Bob to craft a custom message back to Alice. Or,

    - Hit a button to ignore the call.

- In call status – Alice can get a "User Busy" or "Unavailable" if a target user is already in engaged in a Private or Group Call.

- Call attempt failure – In the case where the Call Alert is ignored or rejected by Bob, then Alice should be made aware that call attempt has been terminated and a mechanism should exist so that it is possible not to charge Alice for making the call attempt. This assumes a mechanism has not been activated which enables Alice to leave a message.

5.6.7 Operational and Quality of Experience Requirements

PoC Terminals should support the following (as a minimum):

- Upon receipt of a Call Alert, the pressing the POC button should immediately setup a Private Call to the Call Alert originator.

- The terminals should support distinct comfort tones to announce an incoming call alert.

- A contact list allowing for easy selection of the target users should be supported, as well as recent call lists.

- Presence information should be available for all or a subset of users in the contact list.

- Originator Caller ID information must be provided to the recipient of a Call Alert.

5.7 Use Case G, User Defined Group Call – One-to-Many

5.7.1 Short Description

Group Call is a half-duplex dispatch audio communications between multiple subscribers. In the case of User Defined Group Call, a user invokes a Group Call to a group list that user previously created via a network provisioning action. A user creates and provisions a group which creates a persistent group identifier (which is held in the network and the handset) that the group owner can reference from his/her contact list. The subscriber that creates the group member list is the group owner

for that group, and other members cannot change that member list, unless modification permissions are given to those members.

The user can define the group member list via web mechanisms in the network, or via handset GUI operations, which allow the user to pick people from their contact list, and add those people to a group list definition. The group is given a name or handle, which can then be then referenced in the owners contact list.

If group members are in an automatic accept mode of call acceptance, typically associated with having high audio /speaker phone operation, the called parties are automatically joined to the group call. Otherwise, if they are in an invited mode of call acceptance, the called parties have the option of accepting or rejecting the group call invitation.

5.7.2 Actors

- Participants: Alice, Bob, Charlie, and Dave. Alice has defined a group, "Workteam", consisting of Alice, Bob, Charlie, and Dave. Alice wishes to call the "Workteam", for a short conversation.
- Host: In this case, Alice is the owner of the group "Workteam", and will initiate the group call.
- Network operator.
- Service provider

5.7.2.1 Actor Specific Issues

Participants

- Users want to respond quickly communicate using voice to a broad number of people, and have all those people participate in a discussion.
- Want easy to use handsets, with fast methods of selecting users and initiating a call.
- Want reasonably good voice quality.

Network Provider

- Wants to attract customers to new service.
- Wants to reduce subscriber churn to other network providers.
- Wants to maximise potential for VoIP services, offering new revenue generating service.

5.7.2.2 Actor Specific Benefits

Participants

- Better productivity – PoC calls are of quick duration, and gets users back to more productive tasks (vs. waiting for calls, or participating in calls that typically last longer than PoC calls).
- Ease and speed of placing PoC group voice calls. Group Calls far easier to coordinate that establishing conventional conference bridges.

Network Provider

- Takes revenue from PoC voice calls. Group Calls can generate large aggregate minutes of use, as many people can be pulled into a call.

5.7.3 Pre-conditions

Alice, Bob, Charlie, and Dave have PoC capable terminals and service subscriptions, and Alice, Bob, and Charlie have powered-on their phones. Dave has not powered on his phone. Alice's, Bob's, and Charlie's PoC phones have registered

with the network for PoC service. The handsets have provided presence information about Alice, Bob, and Charlie to the network (either automatically, or upon their interaction with the handset).

Alice, via a previous provisioning action, created a group called "Workteam" consisting of Alice, Bob, Charlie, and Dave. This group definition exists on both the handset and in the network. The mechanisms for synchronizing the group definitions and the contact lists are outside the scope of this use case.

5.7.4 Post-conditions

Alice, Bob, and Charlie have finished their User Defined Group Call and ended their session. Dave did not participate in the session.

5.7.5 Normal Flow

Alice would follow the same procedure for placing a User Defined Group Call as placing a Private Call, however instead of selecting a specific user on the contact list, a specific group would be selected, and in this case, it would be called "Workteam". In this case, no presence information is provided for a group, as it consists of multiple members with obviously difference presence states (Bob and Charlie are "online", Dave is "offline").

When Alice selects the "Workteam", she then presses and holds the "POC" button/key, indicating to the network that she would like to speak. The network attempts to reach all the group members. Alice hears a talk-proceed-tone as soon as the first group member handset joins the call, indicating that she can now begin to speak. As members are added to the call, Alice is notified as member join the call. For example, if Bob's handset automatically joins the call first, and Charlie's handset joins a few seconds later, Alice would be informed that Bob joined the group, and then a bit later Charlie joined the group. This way, members can be apprised as to who is on the call.

All of the active target members of the "Workteam", Bob and Charlie, will hear a tone to announce the incoming group call. A visual indicator (along with Caller ID of the originator) will be provided to Bob and Charlie to indicate that this is a Group Call verses a Private Call. Each member of the talk group will be able to respond and participate in the call using the previously outlined method for Private Call. PoC subscribers will not be able to participate in more than one group call at a time. The group call will continue with the "Workteam" as long as two or more members are engaged in the call. As soon as only one member exists on the call, or no group activity is detected, the "Workteam" group call session is terminated.

5.7.6 Alternative Flow

A number of alternative flows or methods exist for this User Defined Group Call;

- Call Start Criteria – The talk-proceed could be held off until all active members join. However, if invite methods are required at the target, this could significantly hold up the call start. Therefore, it is recommended that call start occur on the first join of any the group members.
- Call Tear Down Criteria – Based on the billing models, it might be desirable to terminate the group call as soon as the originator leaves the call, especially if the group call is paid for by the calling party. This should be a PoC system configuration capability.
- Missed Call Notifies - Members of the group who are on another POC call and not available for the User Defined Group Call will receive an indication on their handset that a Group Call from the call originator was missed.
- Invite Based Call Treatment - Invitation based call treatment at the target should be supported as in the Private Call.
- Callbacks – Even though Bob and Charlie don't own this group definition, the Group ID will show up in their recent call list. Since Bob and Charlie participated in the "Workteam" call, they can call that group back through their recent call list.
- Call Re-Join – In similar fashion to callbacks, if the one of the "Workteam" members drop off the call (tunnel, took another call, etc.), the members may re-join a group call in progress through initiating a POC call to the Group ID in their recent call list.

5.7.7 Operational and Quality of Experience Requirements

PoC Terminals should support the following (as a minimum):

- The same ergonomic elements called out for the Private Call support (POC buttons, comfort tones, contact lists, speaker phones, recent calls lists, active group member lists, visual indicators of floor control).
- Caller ID of the group originator should be provided to all parties of the group call. Additionally, the friendly group name, "Workteam" should also be provided.
- Current talker ID for the group should be provided.
- A list of active group member participants should be provided by the handset to the user.
- The initial call setup (first "POC") exchange can take longer than subsequent POC setups in the same session.

5.8 Use Case H, Selective Dynamic Group Call – One-to-Many

5.8.1 Short Description

As noted in the previous use case, Group Call is a half-duplex dispatch audio communications between multiple subscribers. In the case of Selective Dynamic Group Call (SDGC), a user invokes a Group Call to a set of members that were selected (dynamically) on the handset, instead of the group members being a static user provisioning action on the network. The user selects the group members from his/her dispatch client contact list, initiates a group call, and the group membership is communicated to the network in near real time. Target members of the group call will be notified at setup time that this is a selective dynamic (e.g., adhoc or temporary) group call. This capability will greatly increase the attractiveness of using group call to reach multiple people, since the provisioning action is removed from the process. It will be a natural user process, similar to adding multiple users to an email, Instant Message, or SMS.

5.8.2 Actors

- Participants: Alice, Bob, Charlie, Dave, and Edward. Alice has defined a group, "Workteam", consisting of Alice, Bob, Charlie, and Dave. Edward is not part of the "Workteam" group. Alice wishes to call Bob, Charlie, and Edward for a quick conversation, but does not need Dave as part of the discussion.
- Host: In this case, Alice is the owner of the selective dynamic group including Bob, Charlie, and Edward. Alice will initiate the group call.
- Network operator.
- Service provider..

5.8.2.1 Actor Specific Issues

Participants

- Group call initiator does not want to spend the time provisioning a group that the user may only want for a temporary amount of time. User want to quickly make a group call without provisioning actions.
- Users want to respond quickly communicate using voice to a broad number of people, and have all those people participate in a discussion.
- Want easy to use handsets, with fast methods of selecting users and initiating a call.
- Want reasonably good voice quality.

Network Provider

- Wants to attract customers to new service.

- Wants to reduce subscriber churn to other network providers.
- Wants to maximise potential for VoIP services, offering new revenue generating service.

5.8.2.2 Actor Specific Benefits

Participants

- Speed of reaching multiple people is now very high. No fixed group provisioning is required. Very rapid interaction to potentially large numbers of people.
- Better productivity – PoC calls are of quick duration, and gets users back to more productive tasks (vs. waiting for calls, or participating in calls that typically last longer than PoC calls).
- Ease and speed of placing PoC group voice calls. Group Calls far easier to coordinate that establishing conventional conference bridges.

Network Provider

- Takes revenue from PoC voice calls. Group Calls can generate large aggregate minutes of use, as many people can be pulled into a call.

5.8.3 Pre-conditions

Alice, Bob, Charlie, and Edward have PoC capable terminals and service subscriptions, and Alice, Bob, and Charlie have powered-on their phones. Alice's, Bob's, Charlie's, and Edward's PoC phones have registered with the network for PoC service. The handsets have provided presence information about Alice, Bob, Charlie, Edward to the network (either automatically, or upon their interaction with the handset).

Alice has Bob, Charlie, and Edward in her contact list. However, Edward is not provisioned as a member of the "Workteam" group previously used.

5.8.4 Post-conditions

Alice, Bob, Charlie, and Edward have finished their Selective Dynamic Group Call and ended their session. Dave did not participate in the session.

5.8.5 Normal Flow

Alice would follow the same procedure for placing a Selective Dynamic Group Call (SDGC) as placing a Private Call, however instead of selecting a specific user on the contact list, multiple users are selected via the contact list user interface. As in User Defined Group Call, no presence information is provided for a group, but in this case, Alice can see individual presence on each member as she selects them to join the call. This way, she can use presence to influence who she should invite to the temporary group call.

When Alice finishes selecting the SDGC members, she then presses and holds the "POC" button/key, indicating to the network that she would like to speak. The network attempts to reach all the group members. Alice hears a talk-proceed-tone as soon as the first group member handset joins the call, indicating that she can now begin to speak. As members are added to the call, Alice is notified as member join the call. For example, if Bob's handset automatically joins the call first, and Charlie's handset joins a few seconds later, Alice would be informed that Bob joined the group, and then a bit later Charlie joined the group. This way, all members can be apprised as to who is on the call.

All of the active target members of the SDGC, Bob, Charlie and Edward, will hear a tone to announce the incoming group call. A visual indicator (along with Caller ID of the originator) will be provided to Bob, Charlie, and Edward to indicate that this is a Group Call verses a Private Call. Each member of the talk group will be able to respond and participate in the call using the previously outlined method for Private Call. PoC subscribers will not be able to participate in more than one group call at a time. The group call will be continued with the SDGC as long as two or more members are engaged in the call. As soon as only one member exists on the call, or no group activity is detected, the group call session is terminated.

5.8.6 Alternative Flow

A number of alternative flows or methods exist for this User Defined Group Call;

- Embedding Defined Groups in a SDGC – In addition to selecting users for a SDGC, Alice could have also selected the "Workteam" as a member for the SDGC. This function will allow the user to use the SDGC capability to temporarily merge multiple groups for a group call. So in the previous case, she could have selected "Workteam" and Edward and gotten the same effect vs. selecting all members individually.
- Call Start Criteria – The talk-proceed could be held off until all active members join. However, if invite methods are required at the target, this could significantly hold up the call start. Therefore, it is recommended that call start occur on the first join of any the group members.
- Call Tear Down Criteria – Based on the billing models, it might be desirable to terminate the group call as soon as the originator leaves the call, especially if the group call is paid for by the calling party. This should be a PoC system configuration capability.
- Missed Call Notifies - Members of the group who are on another POC call and not available for the User Defined Group Call will receive an indication on their handset that a Group Call from the call originator was missed.
- Invite Based Call Treatment - Invitation based call treatment at the target should be supported as in the Private Call.
- Callbacks – Even though Bob and Charlie don't own this group definition, a temporary SDGC Group ID will show up in their recent call list. Since the SDGC is a temporary group, this definition may only last for a period of time (for example, 1 hour), and then will then become an invalid group ID.
- Call Re-Join – In similar fashion to callbacks, if the one of the SDGC members drop off the call (tunnel, took another call, etc.), the members may re-join a group call in progress through initiating a POC call to the temporary SDGC Group ID in their recent call list.

5.8.7 Operational and Quality of Experience Requirements

PoC Terminals should support the following (as a minimum):

- The same ergonomic elements called out for the Private Call support (POC buttons, comfort tones, contact lists, speaker phones, recent calls lists, active group member lists, visual indicators of floor control).
- Caller ID of the group originator should be provided to all parties of the group call. Additionally, an indicator should be provided that indicates that this is a temporary SDGC group. This is to differentiate SDGC group definitions from User Defined Group definitions, since SDGC group definitions are removed from the network after a period of time.
- Current talker ID for the group should be provided.
- A list of active group member participants should be provided by the handset to the user.
- The initial call setup (first "POC") exchange can take longer than subsequent POC setups in the same session.

5.9 Use Case I, Private Chat Group Support – One-to-Many

5.9.1 Short Description

Chat groups in PoC have similar operational behaviours as conventional group calls, with the following main differences;

- When a user builds/defines a Chat Group, it is a private group, and specific members are invited to the chat group. The Chat Group ID is provided by the PoC service to all selected members of the group.

- Users may join the Chat Group via selecting the Chat Group ID from their contact list (or other chat group lists) and pushing POC. However, joining a chat group does not result in inviting all the members of the group, as in group call. Members join the group of their own volition.
- Once users join, they stay attached or bound to that group in a static fashion, whether there are discussions in the Chat Group or not.
- If no one is speaking in the Chat Group, the radio resources may be released by the network after a period of time. Upon activity in the group, the audio will be transmitted to the users attached to the group, which may result in activating the RF channels for those users.
- Users participate in the Chat Group in a half-duplex fashion as in the Group Calls.
- When a user wishes to unattach from the group, this will require a user action on the device to signal to the network to remove him from that Chat Group session.

Chat Groups really differ from a group call in the sense that people join and leave as they wish, and members are not actively pulled into a call as people join. It is "permanently" created by an owner, and has properties similar of a conference bridge.

Concerns exist on the feasibility of public POC Chat Groups that would be created by a PoC service provider. Issues of privacy, name hiding, group moderation and supervision, control / overloading, and the basic utility must be explored more fully.

5.9.2 Actors

- Participants: Alice, Bob, Charlie, Dave. Alice has defined a chat group, "Sales Chat Room", consisting of Alice, Bob, Charlie, and Dave. Alice wishes to have a quick "conference call" at 9 am with Bob, Charlie, and Edward for a fast sales status review.
- Host: In this case, Alice is the creator of the "Sales Chat Room", including Bob, Charlie, and Edward. After she creates the Chat Group, the notification of the "Sales Chat Room" is sent to Bob, Charlie and Edward.
- Network operator.
- Service provider..

5.9.2.1 Actor Specific Issues

Participants

- Chat Group creator wants to create a fast access "conference bridge" that is persistent, and can be used at any time. The group is closed, but readily accessible for all approved members.
- Want easy to use handsets, with fast methods of selecting users and initiating a call.
- Want reasonably good voice quality.

Network Provider

- Wants to attract customers to new service.
- Wants to reduce subscriber churn to other network providers.
- Wants to maximise potential for VoIP services, offering new revenue generating service.

5.9.2.2 Actor Specific Benefits

Participants

- Chat Group provides very fast access "conference bridge service". Very likely more cost effective than paying for conventional bridging service. Also, Chat Group ergonomics will likely shorten meeting times compared to normal conference bridge sessions.

- Chat Group allows people to participate in "Group Call" like sessions, without being bothered with an invitation to join the group call. People join the group on as their schedule allows, vs. being immediately pulled into a group call.
- Ease and speed of placing PoC chat group calls. Group Chat calls far easier to coordinate that establishing conventional conference bridges, and are permanent.
- Better productivity – PoC calls are of quick duration, and gets users back to more productive tasks (vs. waiting for calls, or participating in calls that typically last longer than PoC calls).

Network Provider

- Takes revenue from PoC chat groups. Like Group Calls, Chat Groups can generate large aggregate minutes of use, as many people can join the call.

5.9.3 Pre-conditions

Alice has previously defined a chat group, "Sales Chat Room", consisting of Alice, Bob, Charlie, and Dave, and this Chat Group ID / name has been sent and stored in their devices. Alice wishes to have a quick "conference call" at 9 am with Bob, Charlie, and Edward for a fast sales status review, so Alice sends an SMS message to Bob, Charlie, and Dave requesting them to join the "Sales Chat Room" at that time.

5.9.4 Post-conditions

The "Sales Chat Room" call is over, and all members have exited (un-attached) from the "Sales Chat Room".

5.9.5 Normal Flow

Alice, Bob, Charlie and Dave would follow a similar procedure for joining a Chat Group as placing a Private Call, however instead of selecting a specific user on the contact list, a specific Chat Group would be selected, and in this case, it would be called "Sales Chat Room". In this case, no presence information is provided for a chat group, as it may consist of multiple members with obviously difference presence states (Bob and Charlie are "online", Dave is "offline").

When Alice finishes selecting the "Sales Chat Room", she may press and release ("Quick key") the "POC" button/key, indicating to the network that she would like join the group. The push and release method is suggested so that she can use the POC button as the method to join the chat group, which will cause her to join and be put into a listen mode. This way, if group members have already joined, they may already be speaking and have the floor. She will begin to hear dialog on the next talkspurt after joining. If Alice does not hear anyone speak, she may request the floor via pushing the "POC" button again.

Alternatively, she may press and hold the button after selecting the "Sales Chat Room", and if provided the talk proceed tone, she may immediately begin speaking. However there is a chance that she will be rejected if someone else in the Chat Group is already speaking. Therefore, the press release method is suggested as the preferred behaviour to join a Chat Group.

As members join, the handset devices display the Caller ID's of the joining parties in the Chat Group. Additionally, an 'entry' audio tone is played on the handsets, indicating that a person joined the group.

Alice was the first person to join the Chat Group, Bob joined a few minutes later, and then Charlie and Dave joined the Group near the same time. Once Alice has determined that all the group members are on the call (confirmed through her handset display), she has a discussion with each of the team members on their sales contacts status, in a back and forth half duplex manner as in Group Call. When Alice has all of her status from the team members, she says goodbye and leaves the Chat Group. Bob and Charlie stay in the Chat Group for a while longer to talk about some sports related topics, and Dave is not interested and leaves the chat group. When the members want to leave the chat group, each of the participants detach from the Chat Group via an option on the handset GUI. It should be emphasized that there is no session timer for Chat Groups, and if there is a large amount of time between talk spurts, the chat session is not terminated by the PoC service. Exiting the Chat Group requires a manual action from the member.

5.9.6 Alternative Flows

- Handset Automatically Logs Off Chat Group if Idle - A handset client may have additional functionality to provide an automatic logoff from a chat group if there has been no activity on the group for a period of time, configured by the PoC user.

- Creator Privacy Control – The creator of the Chat Group should have the ability to specify if only the provisioned users may join the group, or if the chat group is open to other non-provisioned members if they are given the Chat Group name/ID.

5.9.7 Operational and Quality of Experience Requirements

PoC Terminals should support the following (as a minimum):

- The same ergonomic elements called out for the Private Call support (POC buttons, comfort tones, contact lists, speaker phones, recent calls lists, active group member lists, visual indicators of floor control).

- Caller ID of all chat group participants should be provided to all parties of the group call. As users join and leave, the handset devices should display the participant lists to reflect the current membership status. Also, join and leave tones should be played at the handset as member join / leave.

- Users must explicitly join and leave the chat group through actions on the handset. No automatic joins, or automatic session teardowns occur for chat groups.

- Current talker ID in the chat group must be provided.

5.10 Use Case J, Mobile Fixed Inter-working

5.10.1 Short Description

Benjamin, Jake and Alexandra are part of the White Knights death match team that participates in Doom death matches on an online gaming service. The White Knights have been challenged by the Dark Lords to a Doom death match. Benjamin has agreed with the head of the Dark Lords to death match at 7:00 PM tonight. Come 7:00 PM Benjamin and Jake have connected to the online gaming service from their game consoles and are chatting using the game services push-to-talk feature. There is no sign of Alexandra and they have to start the Doom death match against the Dark Lords without her. The Dark Lords start beating up the White Knights. It is looking ominous and Benjamin realizes that they desperately need Alexandra. Benjamin uses the online gaming service live talk feature to initiate a PoC session with Alexandra on her PoC enabled terminal.

5.10.2 Actors

- Participants: Jake, a member of the White Knights death match team and the Dark Lords death match team all with PoC enabled Internet terminals

- Participant: Alexandra, a member of the White Knights death match team and a mobile subscriber with a PoC enabled mobile terminal

- Host: Benjamin is the head of the White Knights death match team

- Network Operator: Network operator with PoC service

- Service Provider: Online gaming service

5.10.2.1 Actor Specific Issues

Participants

- Want to quickly contact team members anywhere, anytime, from anyplace, using any device

- Want to use nearest PoC enabled device

Network Provider

- Wants to expand the potential for revenue generation
- Wants to create opportunities for service inter-working.

Service Provider

- Wants to expand the potential for revenue generation
- Wants to increase community reach.

5.10.2.2 Actor Specific Benefits

Host

- Can quickly contact team members anywhere, anytime, from anyplace, using any device.

Network Provider

- Expands the PoC revenue stream.

Service Provider

- Gains additional revenue
- Adds functionality to the service that increases community reach.

5.10.3 Pre-conditions

The online gaming service live talk feature connects with Alexandra's network provider's PoC service

The gaming consoles of all participants include a two-way voice interface such as a speakerphone or headset

Alexandra's online gaming service profile includes her PoC URI

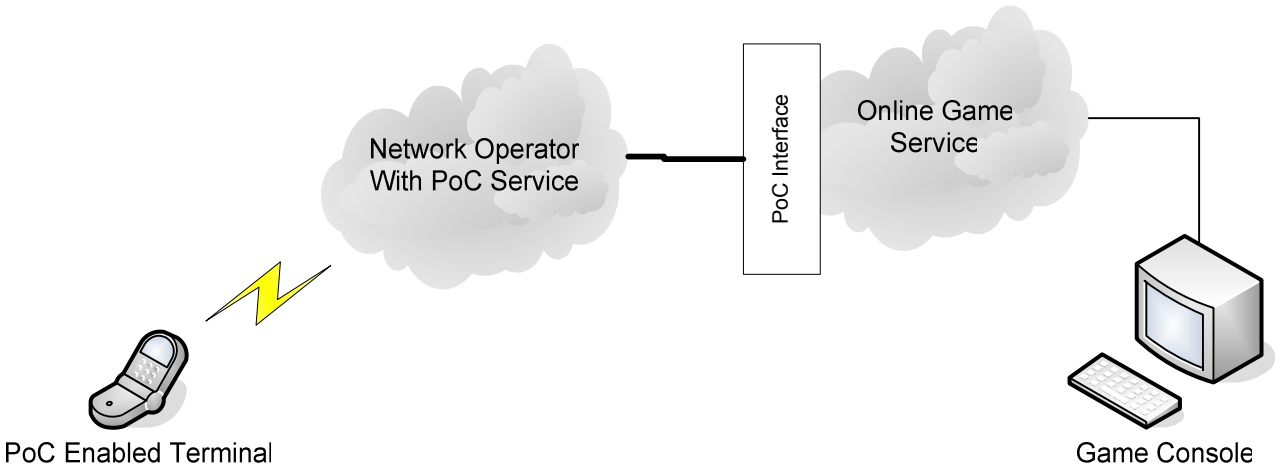
Benjamin's online gaming service account is enabled to use the PoC connection

5.10.4 Post-conditions

Benjamin contacted Alexandra on her PoC enabled mobile terminal. Alexandra joined the Doom death match in time for the White Knights to beat the Dark Lords

5.10.5 Normal Flow

Come 7:00 PM Benjamin and Jake have connected to the online gaming service from their game consoles and are chatting using the game services "live talk" feature. There is no sign of Alexandra and they have to start the Doom death match against the Dark Lords without her. The Dark Lords start beating up the White Knights. It is looking ominous and Benjamin realizes that they desperately need Alexandra.



1) Benjamin selects Alexandra from the list of team members and presses the "Talk" button on his headset.
2) The online gaming service live talk feature initiates the session to Alexandra's PoC enabled terminal via the connection with Alexandra´s network provider's PoC service.
3) Benjamin hears a tone in his headset indicating that he is connected to Alexandra.
4) Benjamin speaks into his headset microphone and releases the "Talk" button and waits for Alexandra's response.
5) The online gaming service sends Benjamin's message to Alexandra's PoC enabled terminal via the connection with her network operator's PoC service.
6) Alexandra hears Benjamin's message. She presses the "Talk" button on her mobile.
7) Alexandra immediately hears a tone on her mobile indicating that she is connected to Benjamin's game console.
8) Alexandra speaks into her mobile, telling Benjamin that she will be online in a couple of minutes, and releases the "Talk button.
9) The network operator's PoC service sends Alexandra's message to Benjamin's game console via the connection with his online gaming service.
10) Benjamin hears Alexandra's message. Benjamin returns to the Doom death match knowing that reinforcements will arrive soon.

5.10.6 Alternative Flow

5.10.6.1 Incoming PoC with session acceptance

As in the normal flow, except…

2.5) Alexandra receives an indication of an incoming PoC session and accepts the PoC session.

5.10.6.2 Incoming PoC with session rejection

As in the normal flow, except…

2.5) Alexandra receives an indication of an incoming PoC session and rejects the PoC session.

3) Benjamin receives an error indication and the PoC session is not established.

5.10.7 Operational and Quality of Experience Requirements

1) The online gaming service live talk feature is capable of connecting with a PoC network.
2) The network operator should be able to exchange charging information for a PoC session with the online gaming service.

5.11 Use Case K, Use of multiple group operation

In this use case, Julie is a cleaner in a hotel, and her work also includes responsibility to coordinate workflow with the hotel laundry.

5.11.1 Short Description

- Julie participates both in the group “cleaners” and in the group “laundry”. The group “cleaners” is used whenever the cleaners need any kind of assistance of each other, and when any other related person has something to communicate to or request from the cleaners. In this example, the groups are chat rooms that are joined by the persons involved at the beginning of their work shift, but the use case can be applied to other types of groups as well.
- Julie is hearing voice from the group “laundry”.
- Now the hotel receptionist selects the group “cleaners” on his/her PoC user equipment. Presses the talk button and starts to talk to ask if there is any vacant, single room already cleaned up.
- Because the group “cleaners” is related to Julie’s primary duties, the transmission of the receptionist will override her reception of the group “laundry” and she will hear the voice of the receptionist.
- Note that the communication in the laundry group is not disturbed in any way. In addition, if Julie is talking in the “laundry” group, she is not interrupted.
- Julie sees on the PoC user equipment display that the “cleaner” group communication is received and receptionist is talking.
- Julie presses the talk button, when she sees on her display that the receptionist talk burst is over and tells that she has a room # 274 available.
- The receptionist thanks Julie and gives the room to the customer.
- After a certain period, if there is no subsequent traffic in the group “cleaners”, Julie starts to hear the group “laundry” again (if there is traffic).

5.11.2 Actors

Participants

- Hotel receptionist, who needs to be able make requests to cleaners.
- Julie, a cleaner, who needs to keep informed of the situation in the hotel laundry.
- Other cleaners.

- Laundry personnel.

Host

- Hotel management

Network operator.

Service provider.

5.11.2.1 Actor specific issues

Participants

- want to be able to receive “handsfree” information related to their work
- want to be able to reach people related to their own work quickly and easily
- want to keep informed of the activities of groups related to their own work, by monitoring traffic in such groups
- want to give priority to the particular group

Hotel management

- wants to optimize the efficiency of their operations
- wants to minimize the communication cost to support the workflow

Network provider

- wants to minimize the resources used for a given revenue

5.11.2.2 Actor specific benefits

Participants

- Each participant hears only the traffic that is relevant to her work

Network provider

- A more efficient solution, because it allows using two small groups instead of one large one, so that less resources are used

5.11.3 Pre-conditions

All parties have PoC capable terminals and PoC service subscriptions. Receptionist and all cleaners on working duty are beforehand joined in the same group “Cleaners”. Julie, one of the cleaners, has joined the group “cleaners” as her primary group and additionally the group “laundry”.

5.11.4 Post-conditions

Receptionist has found a cleaned room.

5.11.5 Normal Flow

Julie activates group “cleaners” as her primary group and the group “laundry” as an additional group.

Julie hears traffic from the group “laundry” if there is no traffic in the group “cleaners”.

Receptionist selects the group "cleaners" to talk to, presses the talk button and asks if any single room is already cleaned.

All group members see that receptionist is talking and hear that she/he is asking a cleaned room. Those group members, who have "cleaners" as their primary group, hear the receptionist even if they were just hearing another group.

One of the group members has a room ready made and she presses the talk button, when the previous talk burst is over and talks to receptionist, that she has a room. All other group members hear also, that room was found and there is no need anymore to talk with receptionist.

5.11.6 Operational and Quality of Experience Requirements

A PoC user shall be able to be joined-in to more than one group at a time for group communication. There can be two levels of groups for a user: one of the joined-in groups may be his primary group and the rest of the groups are secondary.

In case a user only has secondary groups, the main requirements are:

- If there is traffic in more than one group at the same time, there shall be a means to filter the traffic so that the user hears a single conversation
- The user shall start to hear traffic from any group that starts first
- The user shall continue hearing the same discussion (i.e. traffic from the same group) rather than hopping from group to group, unless there is a period of silence to indicate that the discussion has ended
- Because the user will be receiving voice from multiple groups in sequence, there shall be a means to identify which group is being received
- There may also be means to allow user to hears multiple groups at the same time
- When the user wants to talk into a group, she shall be able to select to which group to talk. The selection may also be implicit, e.g. the transmission is to the group that was most recently heard

In case the user has a primary group and secondary group(s), the following additional requirements are

- If there is no traffic in the primary group, the user shall receive traffic from secondary groups according to the requirements described above
- Voice in the primary group shall be received immediately, even if the user was receiving voice in secondary group
- As long as there is traffic in the primary group, the user shall continue hearing it, until there is a period of silence to indicate that the discussion has ended.
- When the user wants to talk into a group, it shall be possible to have the primary group as the default target
- The user shall be able to change her primary group
- When the user is talking, her transmission should not be interrupted because of traffic in another group
- The user shall be able to lock herself temporarily into one group and thus, suspends the listening of the other groups.

5.12 Use Case L, "Whispering" during an active session

5.12.1 Short Description

- Alice, Bob, Charlie, Dave, and a couple of others participate in a chat room or a group call in order to decide which action to take in new and urgent situation. Alice is leading the discussion, but so far no solution has been identified
- Bob has a new idea, but does not want to disclose it yet to everybody, before he has checked some details with Charlie. Bob selects Charlie and presses the talk button to talk to him privately while the communication in the group is continuing.
- Charlie hears Bob's idea and answers quickly to the question that Bob had raised. After a short discussion of 15 seconds Bob and Charlie are back in the group again.
- Bob is now convinced that the idea is workable, and wants to present it to Alice. At the moment, Dave is discussing something with some other participants of the group. Bob selects Alice to talk to her directly.
- Alice hears Bob's idea and agrees that it is worth to consider. After 10 seconds, both are back in the group again.
- When the floor in the group is free, Alice informs that there is a new proposal. Bob starts to present his idea.

5.12.2 Actors

Participants

Alice, Bob, Charlie, Dave, and other group participants.

Network operator

Service provider

5.12.3 Actor specific issues

Participants

- want to be able to conduct short "whispering" discussions person-to-person while taking part in a group communication, without losing more of the group communication that is absolutely necessary

5.12.4 Actor specific benefits

Participants

- Can conduct short private discussions on sensitive issues that they do not want to disclose to the whole group
- Can conduct short private discussions without disturbing the whole group
- Can conduct the active discussion without being disturbed by people having private discussions

5.12.5 Pre-conditions

All parties have PoC capable terminals and PoC service subscriptions. Participants have joined a chatroom, or alternatively there is group call in progress between the participants.

5.12.6 Post-conditions

The participants may either continue the group communication or to conclude it.

5.12.7 Normal Flow

Bob selects Charlie and presses the talk button to talk to him privately while the communication in the group is continuing.

Charlie starts hearing Bob's voice instead of the group traffic.

Charlie listens to Bob's idea and answers quickly to the question that Bob had raised.

Bob selects Alice and presses the talk button to talk to her directly.

Alice hears Bob's idea.

When the floor in the group is free, Alice informs that there is a new proposal

5.12.8 Alternative Flows

Bob selects Charlie and presses the talk button to talk to him privately while the communication in the group is continuing.

Charlie notices that Bob is trying to talk to him, and presses a button to accept.

Bob gets an indication, starts to speak and Charlie starts now hearing Bob's voice instead of the group traffic.

Charlie listens to Bob's idea and answers quickly to the question that Bob had raised.

Bob selects Alice to talk to her directly.

Alice accepts Bob's call, hears Bob's idea.

When the floor in the group is free, Alice informs that there is a new proposal.

5.12.9 Operational and Quality of Experience Requirements

A user, who participates in a group communication, shall be able to initiate and conduct a short person-to-person discussion with another group participant, without losing more of the group communication than absolutely necessary.

A user, who participates in a group communication, should be able to initiate and conduct a short person-to-person discussion with any PoC user, without losing more of the group communication than absolutely necessary.

A person-to-person conversation by a group participant shall not affect in any way the other group participants.

Users shall be able to receive person-to-person whispering calls while taking part in a group communication, either through automatic or manual answer. Users shall be able to control the automatic acceptance of person-to-person whispering calls while in a group, at least in the following ways:

- Calls from participants in the same group accepted.
- Calls from any user accepted.
- Calls require manual acceptance.

5.13 Use Case M – Ad-hoc Chat Group Support – One-to-Many

5.13.1 Short Description

PoC Host creates an ad-hoc PoC Group a week before an important meeting. The PoC Group ID is circulated on a company's internal mailing list. The PoC Host's colleagues, who plan to attend the meeting, register with the ad-hoc PoC Group individually using the PoC Group ID. (A colleague gives the Group ID to his friend; this friend is not part of the group who plans to attend the meeting.) A corresponding buddy list is automatically created; any of the PoC participants in the PoC Group can see who is online/offline

5.13.2 Actors

- Participants (10): Paul, George, Ringo, John, Yoko, Billy, Bob, Eric, Elton and Michael. Paul has defined an ad hoc PoC group called "Meeting Chat Room". (The chat room consists of no members yet. Later on, other people will register themselves to the chat room in a simple manner described later in this paper.)

- PoC Host: Paul is the PoC Host. He creates the "Meeting Chat Room", which now includes no members. After he creates the ad hoc PoC group, a PoC Group ID (numerical or alphanumerical) is displayed on his screen. Paul sends this information to the appropriate members via his email account

- Network operator (or PoC service provider): at registration the network operator provides the facility to check if the entered PoC IDs (PoC user identities) belong to the PoC participant. For this ad hoc PoC service, PoC IDs are of the nature of MSISDNs or SIP URIs so other PoC participants can identify who is in their PoC group. However, in case of public PoC chat rooms, nicknames can be supplemented for PoC IDs.

5.13.2.1 Actor Specific Issues

Participants

- PoC Host wants to create an ad hoc PoC Group on the fly, but he does not want to be bothered with the administrative actions[1]; he wants to have each member register him/herself. Therefore, all members have some administrative rights.

- To maintain some level of security/privacy when a PoC participant registers himself using his Group ID the corresponding MSISDNs or SIP URIs are checked by the network operator and are shown on each PoC Group participant's screen. Any PoC participant can see the list on his/her terminal.

- In some cases, a malicious PoC subscriber, who is an outsider, could steal the PoC Group ID by eavesdropping, and secretly join the PoC Group. A PoC Host has the right to remove any PoC members from the ad hoc PoC Group and to block him/her from future registration.

    - Additionally the PoC Host can also grant rights to any participant to remove/block PoC members.

Network Operator (or PoC service provider)

- The network operator (PoC service provider) checks the registrants' PoC IDs (PoC user identities) at registration. All PoC Group participants are visible to each participant. A cooperated operation between the network operator and the PoC service provider is necessary to archive a certain level of security. Additionally, cooperation of participants (including the Host) can be a measure of fraud avoidance.

  Three levels are provided for PoC group communications

    - *Prearranged□already defined□*
    - *Ad Hoc (already Defined)*
    - *Chat Mode*
        - *Member-only*—Anybody can join the group if he/she has membership via a PoC Group ID.
            - *His (MSISDN/URI) information is displayed*
        - *Public*—Anybody can join the group if he/she has membership via a PoC Group ID.

[1] Ad hoc PoC Group communications are intended for casual ad hoc communications mimicking the legacy walkie-talkie operations. Degraded security/privacy might be a trade-off.

- *His nickname may be displayed*

5.13.2.2 Actor Specific Benefits

Participants

- **Simplicity and quickness for ad-hoc PoC grouping** -- for the PoC Host, administrative actions are limited to the request of the PoC Group ID and the creation of the chat room. This is requested to either a network operator or to a PoC service provider. The PoC host can also define the expiration time (optional) for 1, talk sessions and 2, termination of the group itself (for, say, 2 days after the meeting).
- **Openness** -- anybody who knows the PoC Group ID can join the PoC Group. This is, in a sense, similar to a typical IM chat room.

Network Provider

- **More PTT usage expected—**PoC usage will increase by providing more open access levels; *members-only* access and *public* access.

5.13.3 Pre-conditions

Paul registers and obtains a PoC group ID via the PoC user interface on his terminal. Paul then sends the ID to his colleagues via his company's internal mailing list. His colleagues, who plan to attend the meeting see Paul's message. They get the ID and store it (on paper or via some device). Paul set the PoC Group to terminate 24 hours after the last day of the meeting.

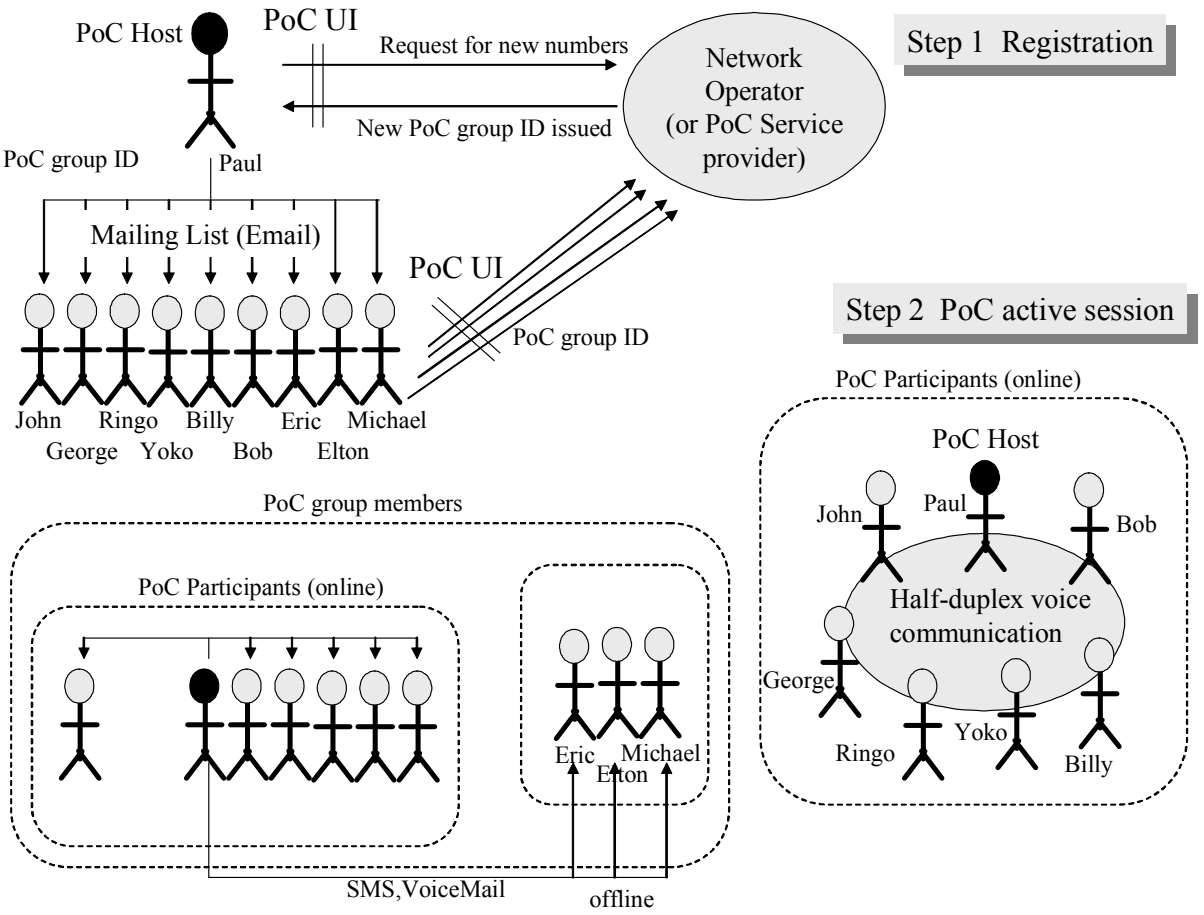
5.13.4 Post-conditions

The meeting is over, and all the members have no use for this PoC Group Chat Room. In 24 hours from the last meeting day (designated by the Host), the PoC Group is terminated.

5.13.5 Normal Flow

The figure below explains the service steps schematically.

Step 1 is divided into two sub-steps; Sub-step 1, the Host requests a PoC group ID, and Sub-step 2, Participants register to the group by entering the PoC group ID via the PoC user interface (PoC UI).



Step 1 Registration

- A week before the meeting, John, George and six other colleagues receive an email form Paul (making 9 total members), which says, "Let's create an ad hoc PoC Group for our upcoming meeting. Please join the PoC Group with this PoC group ID". Some of the members register to the PoC Group at once. But some others do not.
- The morning of the first meeting day, Ringo meets Elton. Elton says to Ringo, "Have you already registered with the PoC Group?" Ringo says, "Darn, I forgot! I lost the ID". Elton jots down the ID on a sheet of paper and says, "You are so forgetful. Here you are", and gives the paper to Ringo. Ringo registers with the PoC Group.
- Yoko comes across Michael in the main venue just near finishing time. Although Michael is not one of the original 9 members, he is one of Yoko's buddies and Yoko wants Michael to join his PoC Group as they will soon go out for beers. Yoko hands Michael the ID.

Step 2 PoC active session

- John, who has already registered to the PoC Group, finds a guy named Michael is suddenly on the list. He is disgruntled and makes a PoC Private Call (one-to-one), "Who on earth are you?" Michael says, "I used to sing with Yoko's husband. Yoko invited me but perhaps she has not notified the group yet. I will log off so that nobody else is surprised. Hope you don't mind me coming with you tonight for drinks and dinner. "
- Around half past 6pm, the group is ready to drink and eat. Paul makes a PoC Alert Call to all the PoC Group participants. Seven participants are logged-in (PoC Participants – online, active), but three other participants (Eric,

Elton and Michael) are offline. After waiting for a few minutes, Paul makes a PoC Group Call by pressing Talk Button, "Guten Abend! I used to live in this area when I was in college. The beer was great. Are we all ready?"

- John replies, "I want to have Eisbein mit Sauerkraut! And beer, of course! My favourite is Berliner Kindle".
- Ringo asks the group, "Say, where shall we dine? I happen to be walking in Europe Centre, a popular shopping mall in West Berlin. I see a German restaurant called Alt-Nuernberg. It looks good. I can even go through the menu while I am talking to you. Group agreed to discuss the menu over the PoC session
- Paul, "After our call I'll send an SMS or voice mail to those offline (Eric, Elton and Michael) with a message, **Eating out, Alt-Nürnberg in Europe Centre, 7PM, Tel:030 2614397".**

5.13.6 Operational and Quality of Experience Requirements

PoC Terminals support the following:

- Chat Mode PoC Group user interface is provided. A user requests and obtains a PoC Group ID that is issued by a network operator/PoC service provider via the user interface. The user enters via the UI, the PoC Group ID to become one of the PoC Group participants. The registered participant is automatically and dynamically added to the buddy list belonging to the PoC Group ID.
- The PoC IDs are tied into either MSISDNs or SIP URIs of all registered participants to the PoC Group and are visible on the PoC Group list. Optionally user names, for example, "John Doe" in this SIP From header field [From: John Doe <sip: Jdoe@necam.com>], are displayed.

A network operator (and PoC service provider) supports the following:

- Chat Mode PoC group services are provided with the following access levels – *members-only* and *public* .
- For *members-only* and *public* access levels, a network operator has to give part of the administrative rights to every PoC group member to let him manage his own PoC group registration.
- For *members-only* and *public* access levels, a network operator has to grant the PoC Host with administrative rights. For example, PoC Host may remove any PoC group member (and block him/her from future participation) in the PoC Group.
  - ✧ Additionally a PoC Host may grant a participant with the same rights
- For *members-only* and *public* access levels, a network operator has to perform some form of authentication for PoC Group member registrations.
- Anonymous access or nicknames may be allowed and are at the discretion of the PoC Host or network operator (PoC service provider).
- For *members-only* access level a 'buddylist' is created when the PoC Group ID is issued or when the first PoC subscriber logs into the 'chat room' of the PoC Group.
- For *public* access level a 'buddylist' may not be created when the PoC Group ID is issued or when the first PoC subscriber logs in the 'chat room' of the PoC Group. However, a network operator must create a 'buddylist' when the PoC subscriber requests a certain level of security/privacy.

5.14 Use Case N, Fleet Dispatch – One-to-Many-to-One

5.14.1 Short Description

A fleet delivery service or taxi service using PoC for dispatching has similar operational behaviour to group calls, with the following main differences:

- Fleet members and dispatcher use a dedicated PoC group for dispatch management.
- The dispatcher is a distinguished actor with capabilities that are quite distinct from those of the fleet members:
    - All fleet members hear the dispatcher, or,
    - In a more sophisticated version where PoC and Locationing services are both available, only fleet members meeting a given criterion selected by the dispatcher, such as being within 5 km of a given location, might hear the dispatcher in a given instance.
    - Only the dispatcher hears an individual fleet member. This is different from all other use cases.
    - Optionally, the dispatcher can preempt the channel from the fleet member.

5.14.2 Actors

- Participants: there are two classes of participant:
    - The dispatcher, who can interact with all the fleet members or any subset of them
    - The individual fleet members, who can only interact with the dispatcher.
- Host: The dispatch channel is typically administered independently of the participants. The administrator assigns dispatch and fleet roles to the participants.
- Network operator: Provides the network and radio resources used for the communications.
- Service provider: may be the network operator, the fleet operator, or some third party provider supporting dispatch as a value-added service.

5.14.2.1 Actor Specific Issues

Participants

- The dispatch channel should be permanently available and easily accessible.
- Access to the dispatch channel should be limited to the dispatcher and the fleet members.
- All fleet members need to be able to hear the dispatcher.
- Only the dispatcher needs to hear the fleet members.
- Voice quality only needs to be intelligible.

Host

- Needs to be able to add and remove fleet members from the group
- Needs to be able to assign different employees dispatcher authority
- Needs standard terminals for fleet members, specialized dispatch terminal for dispatcher.

- Wants to reduce communications costs
- Wants to be able to integrate dispatch with other services, e.g. locationing, emergency systems, text messaging

Network operator

- Wants to replace traditional dispatch channels
- Needs to provide wide coverage
- Opportunity to integrate PoC with other services

Service Provider

- Requires the ability to provide new types of service.

5.14.2.2 Actor Specific Benefits

Participants

- Replaces existing capabilities with equivalent services on standard equipment and with upgrades to integration with additional services.

Host

- Lowers costs through use of non-specialised terminals and shared radio resources.
- Integration with other facilities allows improvements in efficiency of fleet management.

Network operator

- Creates additional revenue stream.

Service Provider

- Provides a new type of service.
- Creates additional revenue stream.

5.14.3 Pre-conditions

The host has previously created the dispatch group, and has identified one member as the dispatcher.

5.14.4 Post-conditions

The dispatcher may convert the one-to-many-to-one call to a one-to-one call with the fleet member who answers.

After interacting with the fleet members, the dispatcher moves to the next action.

5.14.5 Normal Flow

A fleet member may initiate a call to the dispatcher by pressing a Talk button. The dispatcher's response is heard by all fleet members. However the fleet member's side of the conversation is not relayed to the other fleet members. While this conversation is in progress other fleet members may not access the channel.

The dispatcher initiates a dispatch call by broadcasting to all fleet members, or to a filtered subset meeting certain criteria. The return channel is open until one of the fleet members responds.

The dispatcher is notified of the identity of the fleet member. Other fleet members may not be notified of the identity of a fleet member that the dispatcher is in discussion with.

5.14.6 Alternative Flows

If necessary, the dispatcher can cut off a fleet member and open the floor to other fleet members.

5.14.7 Operational and Quality of Experience Requirements

The fleet members' PoC terminals should support speakerphone, Talk button, comfort tones, visual indicators of floor control. Certain common features, such as a visual user interface, may not be required in low-end dedicated terminals.

The dispatch terminal should support speakerphone, Talk button, comfort tones, visual indicators of floor control, tracking of active fleet members, display of speaker identity, history logs etc. It may have wired or wireless access to the network. It is likely to offer other specialized fleet management capabilities integrated with a PoC user interface.

5.15 Use Case O, Corporate Chat

Many situations exist where a quick and efficient communication method is needed but the need for confidentiality is very high and closed user groups are demanded.

5.15.1 Short Description

In this example a small workgroup needs to communicate quickly and privately. They work within the same company and the company has provided them with the PoC enabled terminals from the same service provider.

- A collection of stock traders from company X is considering a major move in the stock price of a stock that they are involved with.
- By mid-day the stock price continues to move and they consider what actions should be taken with the shares.
- The most senior member of the workgroup, Mike, knows his fellow traders from company X all have terminals capable of a private and secure PoC conversation.
- Mike, acting as host, sends an invitation to his co-workers to start the PoC conversation.
- Tom, one of the invitees is caught in another panic trading situation and can't join immediately. He ignores the first invitation and joins a couple of minutes later.
- The conversation proceeds and the stocks are traded within a few minutes after the call has started.

5.15.2 Actors

- PoC Participants: Tom, Peter, Paul and Mary
- PoC Host: Mike is acting as the host.

- PoC Company: Company X has made it possible for this workgroup to have a PoC conversation and is paying the bill for the PoC service.
- Service provider

5.15.2.1 Actor Specific Issues

PoC Participants

- Want to be able to communicate quickly as stocks are volatile and can have significant financial impact.
- Want easy to use handsets with headsets for hands-free use to allow private conversations.
- Want PoC terminals with good voice quality so trading instructions are understood.

Service Provider

- Provides corporate customers a service for business critical applications

Company X

- Company X must have closed confidential user groups to ensure that conversations cannot be overheard and that eavesdroppers are excluded.
- Unauthorised disclosure of the actual names of Group members to third parties must be prevented.
- Secure media link so that conversations cannot be intercepted.

5.15.2.2 Actor Specific Benefits

PoC Participants:

- Trusted and secure system that enables large value stock trades.

PoC Host

- Efficient workgroup communication, which can be leveraged to increase revenue for the company with a solid coordinated effort in selling or buying stocks.

Service Provider

- Increased revenue from corporate customers.

5.15.3 Pre-conditions

All PoC group participants are enabled to use the PoC service and have PoC compatible terminals. All PoC group participants have connectivity to PoC Service Provider through their company subscription.

The group has been authorized and made available for designed employees using company-approved methods for confidentiality,

5.15.4 Post-conditions

When the call comes to an end, the host terminates the call knowing that all will execute the trade instructions.

5.15.5 Normal Flow

- Mike knows that there is a problem in the morning and might even warn his co-workers via e-mail, Instant Message or PoC that they should be prepared for this afternoon trade discussion.

- In the Afternoon the value of some stock continues to move and Mike decides to initiate a conversation with the team using a predefined group name.
- Various people accept the PoC conversation and get their instructions at that time. Any concerns are voiced and a consensus is reached.
- The trade is agreed to and the stock is traded.

5.15.6 Alternative Flow

- An alternative situation Mike forgets to warn his co-workers of what he is planning.
- His attempt to schedule a meeting finds only a small subset of the team available.
- Those that are left and have successfully connected to the PoC service, discuss the situation.
- They have the discussion; Mike decides to call off the trade. He then sends an e-mail, or Instant Message to the team to inform them what has happened.

5.15.7 Operational and Quality of Experience Requirements

- The PoC service entity should allow the subscribers company to affect and authorize the groups that can be used by the user.
- The PoC capable terminal should have a headset in addition to the speaker.
- The PoC service entity should allow corporate PoC calls to have integrity and confidentiality.
- The PoC service entity should allow the company to manage naming identities that are commonly used within the company
- The PoC service entity should allow the company to use a name space within the company that is independent from the addressing used within the PoC network.

5.16 Open Issues

No open issues identified.

6. Requirements (Normative)

Any requirement that is marked with the tags shown in the example below is not implemented in this version of PoC.

Example: [The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,]
"Example of text specifying a requirement that is not implemented in this version of PoC."
[The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]

6.1 High-Level Functional Requirements

This section contains the high level requirements for PoC.

PoC allows users to satisfy real time, half-duplex speech communication in a simple and easy way. A PoC subscriber MAY either join an existing PoC session or MAY create a PoC session spontaneously. A PoC participant, who wants to speak, typically initiates a PoC session on its terminal and starts to speak. Other participants of the PoC group session simultaneously listen to the speaker's voice.

The basic characteristics of a PoC service enabler are as below:

- It allows a user to communicate with other users simultaneously in a half-duplex, arbitrated, walkie-talkie style speech communication. That is, one PoC participant at a time SHALL be granted the right to transmit their speech communication (i.e., to speak) after indicating their desire or intention to speak by activating a user control such as pressing a button/key, while the others on the PoC session SHALL unless otherwise specified, receive the speech communication subject to the ability to do so, e.g. coverage, equipment not being otherwise in use etc (i.e. listen only).

- PoC subscribers MAY communicate in a one-to-one, one-to-many or one-to-many-to-one fashion, and/or send and receive Instant Personal Alerts.

- A PoC subscriber MAY create a PoC group.
  [The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,]
  PoC subscribers MAY join a PoC group and become members of the PoC group.
  [The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]
  A PoC subscriber MAY become member of a PoC group. Only a PoC subscriber that is member of a PoC group MAY join that PoC group session

- A PoC group MAY either be created by administrative means (e.g. a pre-arranged PoC group), or by inviting and adding PoC subscribers to a PoC group session in an ad-hoc manner (i.e. creating an ad-hoc PoC group). An ad-hoc PoC group exists only for the duration of an ad-hoc PoC group session.

- In a chat PoC group, PoC subscribers SHALL be able to join and leave the chat PoC group session themselves. If the chat PoC group is restricted, then only group members SHALL be able to join.

- The PoC group administrator SHALL be able to pre-define a Chat and Pre-arranged PoC group.

  Note: A concise (informative) overview for pre-arranged, ad-hoc and chat PoC groups is available in Appendix B.

- When a PoC participant wishes to speak to the other PoC participant, he SHALL request the "right to speak".

  Note: Unless otherwise indicated, for reading consistency the male gender is used to denote both genders as part of the discussions on normative requirements and procedures in this portion of the document.

- The right to speak SHALL be granted by the PoC service entity. However, the 'right-to-speak' granted SHOULD timeout if not utilised after a certain threshold (to be configured by the PoC service provider). As an option, subsequent requests to speak in the same PoC session MAY be queued.

- In case more than one request is queued, the PoC service entity MAY prioritise requests in the queue.

- The voice SHALL be immediately delivered to other PoC participants of that PoC session who are permitted to receive it.

- Current talker identities SHALL be provided to current PoC group session participants during the ongoing PoC session, unless the caller identity is restricted.
- The PoC Host SHALL is able to terminate a PoC group session at any time.
- The PoC service provider SHALL be able to terminate PoC sessions based on its policy.

  Note: The word "policy" in this requirement is to be understood as in the normal English language, it does not have the meaning as defined in [PEEM].

- The PoC service entity SHALL be able to provide the inviting PoC subscriber with an early indication to start to speak even before invited PoC participants accept the PoC session request. The inviting PoC participant SHALL receive a notification if no PoC participants received the talk burst.
- It SHOULD be possible for a PoC service entity to inter-work with Internet services that have similar voice capabilities (e.g. online gaming service, instant messaging service with audio functionality).
- It SHALL be possible to address PoC users using an E.164 address (Note: MSISDN for GSM/UMTS and MDN for CDMA) and/or SIP URI (Note: if E.164 is used, the handset needs to translate this to Tel URL for communication to SIP IP Core).

6.1.1 The 1-to-1 PoC communication feature

The 1-to-1 PoC communication feature enables a PoC subscriber to set-up a voice communication with another PoC subscriber. When the 1-to-1 PoC session is established, the PoC participants SHALL talk one at a time.

The invited PoC subscriber either accepts the PoC session automatically or reacts manually on the incoming PoC session invitation.

In the automatic answer mode, the inviting PoC subscriber's voice is audible at the invited PoC subscriber's terminal without any action by the invited PoC subscriber.

In the manual answer mode, the invited PoC subscriber confirms the incoming invitation by an appropriate action to accept the invitation to the PoC session.

In order to talk, a participant in a PoC session uses floor control for starting and ending of the talk-burst.

6.1.2 Three modes of 1-to-many PoC communication features

For the 1-to-many PoC communication mode, three modes SHALL be supported; namely, the pre-arranged mode, the ad hoc mode and the chat mode.

Attributes applicable to pre-arranged PoC groups:

- A PoC session between pre-arranged PoC group members SHALL be established when any individual member of the same pre-arranged PoC group invite the group.
- The voice communication SHALL be able to start after the first PoC group member accepts the invitation and the initiator of the PoC group session establishment receives the right-to-speak indication.
- The participation in a pre-arranged PoC group session SHALL be restricted to the members of the PoC group.
- Members of the pre-arranged PoC group SHALL either be invited when the PoC group session is established or SHALL be able to join in an ongoing session.
- Additionally, any PoC participant in the pre-arranged PoC group session MAY be allowed to invite additional PoC subscribers who are currently members of that pre-arranged group to participate in the ongoing PoC group session.

Attributes applicable to ad-hoc PoC groups:

- An ad hoc PoC group session SHALL be established when a PoC subscriber selects more than one other PoC subscriber and invites them.
- The voice communication SHALL be able to start after the first PoC subscriber accepts the invitation to participate in the ad-hoc group session the initiator of the PoC group session establishment and receives the right-to-speak indication.
- To participate in an existing ad-hoc PoC group session, an invitation from an ad-hoc PoC group session participant SHALL be needed.
- As an exception, PoC subscribers SHALL be able to re-join a ad-hoc PoC group session for which they previously received an invitation (e.g. user rejects invite, left the session).

Attributes applicable to chat PoC groups:

- A chat PoC group session SHALL be established as soon as the first PoC subscriber joins in.
- The voice communication between chat group participants SHALL be possible at the time the chat PoC group session is established.
- A PoC subscriber SHALL be able to establish a chat PoC group session or join into an ongoing chat PoC group session.
- A PoC subscriber MAY be invited to the chat PoC session.
- The participation in a Chat PoC group sessions MAY be restricted, or unrestricted.

6.1.3 Instant personal alert

Instant personal alert is a PoC communication feature that allows a PoC subscriber to request another PoC subscriber to initiate a 1-to-1 communication back to the originator. The invited PoC subscriber SHALL be able to recognize the Instant Personal Alert request, together with the inviting PoC subscriber's identity, subject to the inviting PoC subscriber's privacy rules. The alerted PoC subscriber SHALL be able to initiate a PoC session with the alerting subscriber in response to receiving the alert, possibly at some later time. The PoC Client SHALL be able to receive and MAY be able to send Instant Personal Alerts

Since Instant Personal Alert does not create a PoC session, PoC subscriber's presence condition are not affected by Instant Personal Alerts (Ref: Chapter 6.2.6 Presence Features).

According to the description in [6.1.9.6] (PoC accept / reject list), a PoC subscriber MAY maintain the identities of other PoC subscribers from whom he does not wish to receive PoC talk requests. The same rejection conditions MAY apply to Instant Personal Alerts, subject to PoC service provider policy.

The Do-not-Disturb Presence feature SHALL not apply to Instant personal alerts. (Ref: Chapters 6.2.4 and 6.2.4.2 Presence)

A PoC subscriber who is participating in a PoC session SHALL be able to receive and send Instant personal alerts.

6.1.4 PoC Session Set-up Methods

This chapter describes PoC session set-up procedures. A distinction between 1-to-1 PoC session and 1-to-many PoC session applies.

6.1.4.1 Initiation of 1-to-1 PoC session

This section describes the PoC session set-up steps for a 1-to-1 PoC session.

- The inviting PoC subscriber SHALL invite another PoC subscriber to participate in the 1-to-1 PoC session.
- The PoC service entity MAY provide an early start to speak indication to the inviting party before the invited PoC subscriber answers the invitation.

- If the invited party accepts the invitation, the inviting PoC subscriber SHALL receive an indication that the invited PoC subscriber has accepted the invitation.
    - The inviting PoC subscriber MAY keep or discontinue the PoC session (e.g. reject the invited party's accept if he took too long to answer).
    - If the inviting PoC subscriber keeps the PoC session and receives the ready-to-speak indication, then inviting party MAY start to talk, otherwise speaking is not permitted.
- The speech of the inviting PoC subscriber SHALL be delivered as soon as the invited PoC subscriber accepts the PoC session invitation.

6.1.4.2 Initiation of 1-to-many PoC session

This subsections contained herein describe the PoC session set-up procedures for the three types of 1-to-many PoC session features.

6.1.4.2.1 Pre-arranged PoC group session set-up.

A pre-arranged PoC group list already exists and contains some PoC group members. One of the PoC group members wants to speak to other PoC group members.

- A member of a prearranged PoC group SHALL be able to request the establishment of a PoC session to all members of the prearranged PoC group by using a single group identity and waits for establishment indication.
- [The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,] Optionally, the PoC service entity MAY check if at least one of the PoC group members is able to participate. [The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]
- The PoC service entity SHALL be able to allow only the PoC group administrator to originate the pre-arranged PoC group session.
- The PoC service entity SHALL invite all accessible PoC group members to participate in the PoC session.
- [The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,] Optionally, the PoC service entity MAY select a set of PoC group members based on a pre-determined criteria (e.g. based on their availability or presence information), and only invite this selected subset to participate in the PoC session.
  [The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]
- The PoC service entity MAY provide an "early start to talk" indication.
- The PoC service entity SHALL be able to receive a "confirmation" indication from each invited PoC group member.
- The inviting PoC subscriber SHALL receive a notification if none of the invited PoC subscribers accept the invitation.
- The inviting PoC subscriber MAY receive indications that the invited PoC subscriber has accepted the invitation.
- The PoC communication SHALL be possible to start as soon as at least one of the invited members accepted the invitation.
- The speech of the inviting PoC group member SHALL be delivered as soon as at least one of the invited PoC group members accepts the PoC session invitation.
- A PoC group member of the group SHALL be able to join the ongoing PoC session. This SHALL NOT cause any invitations to the members currently not participating in the PoC session.
- It SHALL be possible for the service provider to configure a maximum number PoC participants in a pre-arranged PoC group session.

- A PoC participant that has been disconnected from the pre-arranged PoC group session SHALL be able to re-join the same PoC group session, if it is still ongoing and the maximum number of PoC participants is not exceeded. Otherwise the re-join procedure SHALL be rejected.
- The PoC service entity SHALL be able to provide the inviting PoC subscriber with an early indication to start to speak even before invited PoC participants accept the PoC session request.

6.1.4.2.2 Ad-hoc PoC group session set-up

A PoC group does not exist yet and a PoC subscriber wants to establish PoC session with several PoC subscribers

- A PoC subscriber SHALL be able to invite selected PoC subscribers to the Ad-hoc PoC group session.
- [The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,] The inviting PoC subscriber SHOULD receive notification of the result of the invitation as per the invited PoC subscriber.
  [The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]
- When at least one PoC subscriber has accepted the invitation the inviting PoC subscriber and the accepting PoC subscriber SHALL be able to start the PoC session.
- The inviting PoC subscriber SHALL receive a notification if none of the invited PoC subscribers accept the invitation.
- It SHALL be possible for the PoC service provider to configure a maximum number maximum number of PoC participants in an ad-hoc group session.
- A PoC participant who has been disconnected from the ad-hoc PoC group session SHALL be able to re-join the same PoC session if it is still ongoing and the maximum number of PoC participants is not exceeded. Otherwise, the re-join procedure SHALL be rejected.
- The PoC service entity SHALL be able to provide the inviting PoC subscriber with an early indication to start to speak even before invited PoC participants accept the PoC session request.

6.1.4.3 Reception of PoC Session Invitation

This chapter specifies requirements for reception of PoC session invitations of any type. The invitation applies to either to 1-to-1 or 1-to-many PoC sessions.

- The invited PoC subscriber SHALL get an identity of the inviting PoC subscriber and the identity of the pre-arranged group being invited, if such an identity exists, subject to privacy rules.
- The invited PoC Client SHOULD support auto-answer or manual answer or both. When both answer modes are supported the PoC Client SHALL support the setting of the answer mode. PoC service entity SHALL support both answer modes and answer mode setting.
- If the invited PoC subscriber has activated the auto-answer setting, he SHALL hear the speech from other PoC participants without any action by the invited PoC subscriber (e.g. without manually answering the PoC session invitation).
- As an option, if the invited PoC subscriber has activated the manual-answer setting, he SHALL be alerted of an incoming PoC session invitation. The invited PoC subscriber SHALL be able to accept, ignore or reject the invitation manually.

6.1.4.4 Joining a chat PoC group session

- A PoC subscriber SHALL be able to join a chat PoC group session (e.g. restricted or unrestricted chat group) depending on the access rules.
- It SHALL be possible for the PoC service provider to configure a maximum number of participants in a chat PoC group.
- The PoC service entity SHALL be able to reject the joining subscriber for any of the following reasons:
    - The PoC subscriber is not a member of the restricted group.
    - The maximum number of participants has already joined the group session.
    - The requested group does not exist.

  In this case, the PoC service entity SHALL provide reject indication and a cause.
- The joining PoC subscriber SHALL be able to start communicating with other PoC participants in chat PoC group.
- A PoC subscriber SHALL NOT be forced to reveal his identity to other participants in an open chat PoC group.

6.1.5 Communication Phase

6.1.5.1 Floor Control requirements

Floor Control is the mechanism for the arbitration of the sequence of PoC participants to speak.

The following list SHALL be the least set of requirements on Floor Control:

- To indicate to a PoC service entity that a PoC participant requests to speak.
- To indicate permission to a PoC participant to speak in response to a request.
- To indicate to a PoC participant that a request to speak has been denied.
- To indicate to a PoC service entity that the participant has finished speaking.
- To indicate to a PoC participant that his speaking has been forced-released.
- To indicate to all PoC participants that the granted PoC participant has finished speaking and floor is idle.
- To indicate to all PoC participants that the PoC participant is about to speak (i.e. a PoC participant has been granted the right-to-speak).

Implementations of the PoC Service Enabler and PoC Client in the terminal device MAY support floor request queuing. If supported, Floor Control SHALL provide the following capabilities as described below:

- To indicate to a PoC participant that a request to speak has been queued.
- To permit a PoC participant who has requested the floor to obtain his or her position in the floor request queue.
- To permit more than one level of priority in access to the floor, e.g. a higher priority PoC participant MAY be allowed to pre-empt a lower priority PoC participant.
- To allow the requester to cancel the request.

Performance requirements related to floor control SHOULD consider the constraints imposed by the underlying signalling transport, with particular emphasis on those associated with over-the-air transport.

6.1.5.2 Joining a PoC session

A PoC subscriber SHALL be able to join an ongoing PoC group session, if the maximum number of participants is not exceeded.

Joining a PoC session applies to members of pre-arranged or restricted chat PoC groups. For unrestricted chat PoC group sessions, any PoC subscriber MAY join in. For ad-hoc PoC group sessions, joining is only possible if the PoC subscriber was a PoC participant in the ad-hoc PoC group session before, left it and re-joins it.

6.1.5.3 PoC Session Participant information

PoC session participant information SHALL be able to be delivered by either of two modes if requested, and is not restricted. The mode SHALL be selectable by the PoC participant, depending on whether he wants to:

a) Request information on who is currently participating in the PoC group session at this time.

b) Request continuous information on who is participating in the PoC group session. In this case, there is an indication when:

- a PoC participant leaves or is removed from the PoC session.
- a PoC participant joins or is added to the PoC session.

The PoC participant MAY also choose not to request any PoC session participant information.

6.1.5.4 Leaving of PoC session

The PoC participants SHALL be able to leave the PoC session at any time.

6.1.5.5 Removing a PoC participant from PoC session

The PoC service entity SHALL be able to remove a PoC participant from the PoC session.

6.1.5.6 Adding PoC subscriber(s) to a PoC session

A participant of the PoC session SHALL be able to add new subscriber(s) into the 1-1, Pre-arranged or Ad-hoc PoC group sessions only, subject to service provider policy. The inviting PoC subscriber and the PoC Host SHALL receive notification of the result of the invitation as per the invited PoC subscriber. The notification can be for example:

- An invited PoC subscriber accepted invitation,
- An invited PoC subscriber rejected invitation or
- An invited PoC subscriber was unavailable. Reception of "unavailable" condition notifications by the inviting PoC subscriber or PoC Host SHALL be subject to his Presence service subscription, if one exists, or to PoC service provider policy, as applicable. (see Chapter 6.2.4.4).

After the PoC session is accepted the newly added PoC participant SHALL receive the status of the floor.

The added participant MAY be notified with the identities of all current participants whose identities are not restricted.

Addition of a PoC subscriber SHALL not affect the ongoing communication.

The added subscribers Identity SHALL be included in the list of participants (subject to restriction policy), which is distributed to those session's participants who have requested the participant information updates, subject of privacy rules.

It SHALL be possible to add subscribers to a PoC group as long as the maximum number of PoC group participants is not exceeded. The maximum number of PoC participants MAY be set by the PoC service provider and MAY vary for each PoC group.

6.1.6 PoC session termination by Service Provider

A PoC session SHALL terminate according to the PoC service provider policy.

If there are still PoC participants left in the PoC session that is terminated by the PoC service provider, those PoC participants SHALL be removed from the PoC session and no PoC participant SHALL be able to rejoin.

6.1.7 Security

Prior to any PoC service interactions (e.g. PoC administration & configuration, PoC sessions) the PoC service entity and the PoC subscriber SHALL be mutually authenticated.

The speech communication and signalling in PoC sessions SHALL be transported in a secure manner.

The PoC service entity SHOULD be able to log the information about any PoC interactions.

PoC service enabler SHALL ensure integrity of PoC signalling.

6.1.8 Charging

The PoC service entity SHALL be able to collect sufficient information needed for charging, both types of PoC subscribers, (prepaid and post-paid subscribers).

The PoC service entity SHALL support sufficient mechanisms to allow various forms of charging. Information of relevance SHOULD include but not be limited to, the following items.

For Subscription based Charging

- PoC Subscriber status relative to PoC subscription, i.e. PoC subscribed, PoC unsubscribed, PoC subscription suspended or temporarily barred (by the service provider).
- Identity of each PoC group in which the PoC subscriber participates (as configured by the service provider).
- Maximum Size of each PoC group (i.e. maximum number of participants who joined the session, regardless of having spoken or not) in which the PoC subscriber has participated within a defined period (as configured by the service provider).

For Support Traffic based Charging (in addition to that for Subscription based Charging):

- Duration of a session, with start and finish time stamps.
- Duration of speaking time in a session (i.e. total time periods for all talk bursts by a subscriber).
- Number of PoC participants, including their identities.
- Number of “ready-to-speak” request granted.
- Number of sessions initiated, i.e. successful attempts.
- Number of failed session attempts, with time stamps of failed attempts.
- Volume of data (e.g. voice packets, bytes).
- Type of PoC session.
- PoC service interactions (e.g. join a PoC group, leave a PoC group, administer PoC groups, etc).
- Separate Charging Data Records (CDR) generated for originator and terminator of each PoC session.
- CDRs for the underlying packet connectivity resource indicates that the connectivity session is being used for PoC.

Latency should be a time-based value captured as part of the CDR; this would allow service providers to define their own thresholds for unacceptable latency (e.g. for operational performance measurements).

The PoC service entity SHALL provide records for failed delivery of talk bursts.

During a PoC group session, talk bursts can be generated by various PoC participants, CDRs for traffic generated by each active PoC group participant individually SHALL be available.

6.1.8.1 Charging requirements for roaming subscribers

PoC is intended to be used at home network, i.e. the network with which the subscription is held, when roaming and across networks. It SHALL be possible for Services Providers to ascertain the usage of the PoC service entity by PoC subscribers who are roaming. CDRs SHALL be made available both for usage of data connections and usage of the PoC service entity for roaming situations.

6.1.8.2 Charging requirements for inter-provider accounting

It SHALL be possible for Service Providers to ascertain the usage of the PoC service entity by PoC subscribers to an interconnected network. CDRs SHALL be made available both for usage of data connections and usage of the PoC service entity for interconnect situations.

6.1.9 Administration and configuration

PoC subscribers SHALL have the following minimum set of capabilities for all PoC sessions,

- Generate and manage PoC subscriber defined pre-arranged PoC group lists to be utilised by the PoC service entity.
- Generate and manage PoC subscriber defined chat PoC groups.
- Manage PoC session treatment methods including Presence features - if supported, auto accept vs. manual accept and rejection based on identity of inviting PoC subscribers.
- Generate and manage a PoC subscriber's own contact list.

PoC service providers SHALL have the following minimum set of capabilities,

- Generate and manage the PoC subscriptions
- Generate and manage pre-arranged and chat PoC group list, accept/reject lists, answer mode setting.
- PoC client administration and configuration SHOULD be possible using existing OMA Device Management Enablers.

6.1.9.1 Visibilities of PoC groups

[The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,]
The PoC group SHALL be visible to the PoC Host. When a PoC subscriber searches for available PoC groups, a PoC group MAY be found or not found according to the following pre-defined conditions:

- The PoC group is visible to PoC group members only, or
- The PoC group is visible to all PoC subscribers, or
- PoC group is visible to the PoC Host only.

[The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]

6.1.9.2 Membership to more than one PoC group

A PoC subscriber MAY be a member of more than one PoC groups at the same time.

6.1.9.3 PoC Session termination policies

The PoC service provider SHALL be able to cause the termination of the PoC session due to one or more reasons in the following list:

- Termination by PoC group administrator;
- Termination upon the last PoC participant leaving in the PoC session;

- Termination upon the second last PoC participant leaving in the PoC session;
- Termination upon the initiator leaving of the PoC session;
- Termination after a pre-defined time period;
- Termination after a pre-defined time period without any talk-burst traffic in the PoC session.

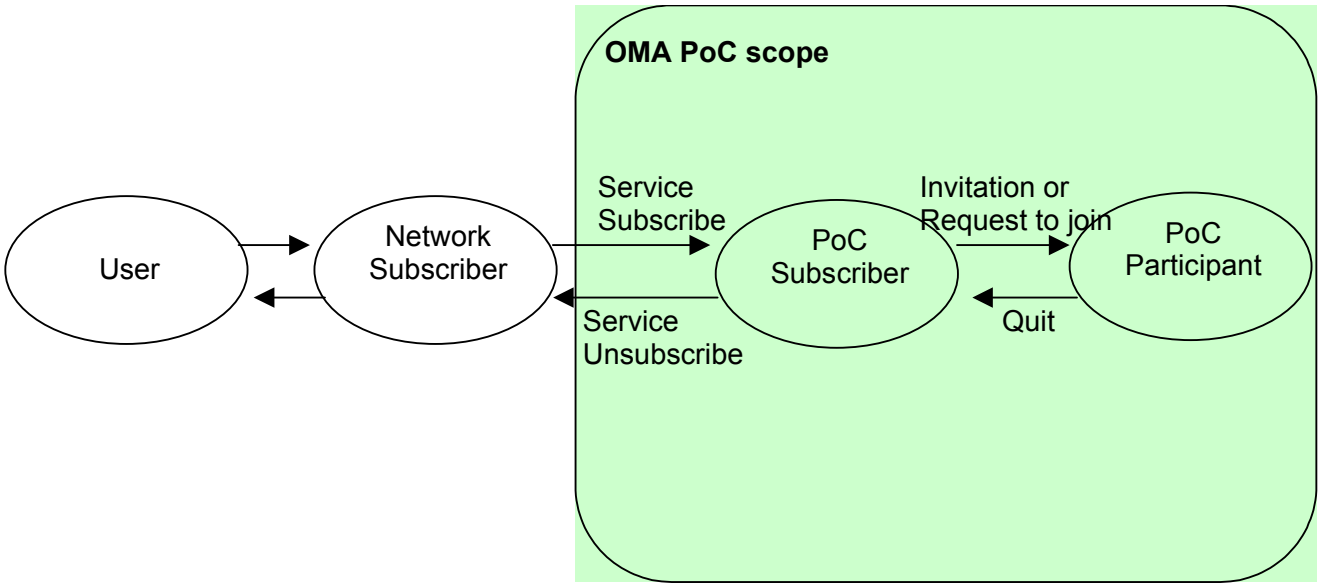
[The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,]
A PoC Host MAY be able to trigger the termination of the PoC session as described below.

- Termination of session by date or date/time

[The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]

6.1.9.4 State transition of the actors

- Before an individual user can use PoC service features, he SHALL have a network subscription with one or more (cellular) network operators.
- A subscriber MUST first subscribe to a PoC service offered by a PoC service provider. Once the subscription is completed, he becomes a PoC subscriber.
- Before a PoC subscriber can become a PoC Participant he SHALL either "be invited to the PoC session and accept the invitation" or "request to participate in the PoC session and have the request accepted. When he becomes a PoC participant, he is able to receive and transmit talk burst in the PoC session.



Note that the host is also an entity, but with the special attribute in the PoC participant. The host does not explicitly appear on the figure above.

6.1.9.5 PoC group and contact list management

The PoC subscriber uses a pre-arranged and chat PoC group as a means to establish PoC session where the PoC group attributes control the session type and who MAY participate in the PoC session. A pre-arranged and chat PoC group identity SHALL be used to address the group and initiate a PoC session

A PoC subscriber SHOULD have means to store the addresses of PoC subscribers pre-arranged and chat PoC PoC groups in order to use that information to contact them using PoC features. For this purpose a PoC subscriber SHOULD have at least one contact list.

Following the creation of the contact list the PoC subscriber SHOULD be able to create PoC groups by associating individual entries on his contact list. Each individual contact can be associated with a single PoC group, several or all PoC groups.

A PoC subscriber SHOULD be able to create & manage PoC group lists from his handset or in a server in the service provider's intranet or the Internet.

It SHALL be possible to form PoC groups that include PoC subscribers from different PoC service providers.

The maximum number of members in a PoC group SHALL be configurable by the PoC service provider.

The maximum number of PoC groups that can be created and managed by a PoC subscriber SHALL be configurable by the PoC service provider.

PoC group list management SHOULD have safeguards (e.g. passwords) to prevent mis-use or unintended generation of traffic to the network.

[The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,]
PoC Group list combinations (Optional):

- Various PoC groups MAY be combined to create a new group.
- A PoC subscriber MAY have the capability to create and manage their own pre-arranged, ad-hoc or chat group lists, subject to service provider policy and accesss rules.
- A PoC subscriber may use groups to which they belong, defined by themselves or other PoC subscribers, to define new group combinations, subject to service provider policy and access rules.

[The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]

6.1.9.6 PoC accept / reject list and answer mode management

On the reject list the PoC subscriber maintains the identities of PoC subscribers and/or PoC groups from whom the PoC subscriber does not wish to receive PoC session invitations.

On the accept list, the PoC subscriber maintains the identities of PoC subscribers and/or PoC groups from whom the PoC subscriber agrees to receive PoC session invitations. In addition to the accept list, there is an answer mode setting which is controlled by the invited PoC subscriber. If the PoC subscriber sets the answer mode to "auto", PoC session invitations from PoC subscribers or PoC groups on the accept list SHALL be answered automatically. If the answer mode setting is set to "manual", then the manual-answer mode is applied. As soon as answer mode setting is set to "manual" on the terminal, audio SHALL not be played automatically by the PoC user's terminal.

Note that if the optional Manual Answer Override is supported and Manual Answer Override has been requested by the inviting PoC User and authorised by the invited PoC Subscriber, then the PoC session invitation is answered automatically.

The PoC service entity SHALL maintain a list of sources per PoC subscriber that are to be rejected with no notification to the PoC subscriber.

The PoC service entity SHALL reject PoC session invitations destined for a PoC subscriber when he has notified the service provider that he wishes to reject all PoC session invitations from the specified sources.

6.1.10 Usability

The PoC service entity SHALL NOT prevent the PoC subscriber's operation of other OMA compatible services, for which the PoC subscriber is authorised and subscribed.

The PoC service provider SHALL be able to decide the maximum number of PoC participants supported in a PoC group session.

Administrative rights of an active PoC group session MAY be assigned to any of the participants by the session Host, or the PoC service provider.

It SHALL be possible to queue more than one speaking request at the same time.

The PoC application on the handset SHALL run concurrently with other service applications in the device. A specific mode of operation SHALL NOT be required of the handset, which could restrict other service operations.

Concurrent service execution SHALL be supported by the PoC service enabler (e.g., take a telephony call, putting a PoC session on hold), but MAY be limited by capabilities of the supporting network or the ability of the handset device. The PoC service enabler SHALL NOT restrict concurrent service execution.

6.1.11 Privacy

A PoC service entity SHALL allow a PoC participant to hide his identity from all of the other PoC participants and SHOULD be able to hide his identity from some of the PoC participants. However, a PoC group administrator SHOULD NOT be compelled to accept unidentified participants into a PoC session.

A PoC participant SHALL be able to select the identity that is displayed to the other PoC participants, which MAY be in the nickname form, URI form or MSISDN form.

The PoC service entity SHALL NOT disclose PoC subscribers' personal data, e.g. identity or subscribed-to PoC groups, to any unwanted parties, in order to prevent undesired PoC session invitations.

The PoC service entity SHALL provide secure storage for PoC subscribers' personal data, e.g. identity or subscribed-to groups.

Privacy requirements SHALL be compliant with requirements stated in [Privacy].

6.1.12 Lawful Intercept

The PoC service enabler SHALL support capabilities to allow Lawful Interception.

6.1.13 Legacy Handset Support

The PoC Service enabler features are only accessible to PoC subscribers, subject to the scope of his PoC service subscription, and his terminal device capabilities.

If special means and/or updates of the PoC subscriber's handset are necessary in order to access any part of the PoC service enabler, it SHOULD be possible for a PoC subscriber to "update" his mobile in an easy way (e.g. over-the-air download).

6.1.14 Service Provisioning by Service provider

Where device management is supported by the PoC service entity and the PoC subscriber's terminal and client, it SHALL be possible for the PoC service provider to set up and update PoC communication feature configuration remotely in the terminal device. This SHOULD include:

[The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,]

- Setting up of the PoC key(s) and any icons and indications required on the terminal device, as applicable.

[The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]

- Causing a new contact list or update of an existing contact list to be remotely installed on a PoC subscriber's client.

- Causing Accept/Reject lists or update of an existing accept/reject list to be remotely installed on a PoC subscriber's client.

It SHALL be possible for the PoC service provider to provide means (e.g. a user-interface from the PoC subscriber's terminal or via a web page) for the PoC subscriber to configure and update his PoC settings (e.g. manage group lists or accept/reject lists).

6.1.15 Support of PoC Usage in Enterprise/Corporate Environment

The following requirements applicable to PoC usage in enterprise/corporate environment are in addition to other requirements covered throughout Chapter 6:

- The PoC Service Entity SHALL be able to interact with a corporate PoC system, subject to commercial agreement.
- When interacting with a corporate environment, the PoC service entity SHOULD ensure that private addresses used within the corporate environment are not exposed, shared or broadcast to PoC subscribers outside of the corporation.

6.2 Operational Requirements

6.2.1 High Level Requirements

The high level requirements for the PoC service are as below:

- PoC subscriber SHALL be able to request the PoC service provider to create a PoC group on his behalf.
- [The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,] PoC subscriber MAY download a list of chat PoC groups that he can join. [The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]
- PoC service provider SHALL be able to create a PoC group according to the request of a PoC subscriber.
- Service Provider SHOULD be able to advertise the PoC group information (e.g., PoC group identity, PoC group administrator of the PoC group).
- PoC host SHOULD be able to advertise the PoC group (e.g. group identity) to all group members.
- The PoC host SHOULD also be able to allow any subscriber to advertise the unrestricted PoC group to any subscriber.
- PoC service provider MAY grant administrative rights to a PoC subscriber.
- A PoC subscriber MAY join a PoC group by sending the request to the PoC Host of the PoC group.
- A PoC Host SHALL be able to remove a PoC group member from the PoC group.
- [The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,] A PoC Host MAY grant, or reject, requests from PoC subscribers to join the PoC group. [The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]
- A PoC service entity MAY be able to queue the request to talk.
- A PoC participant SHALL be able to cancel a request to talk.
- A PoC participant SHALL be able to receive notification of incoming requests for other services (e.g. an incoming simple voice call) while in a PoC session.
- A PoC participant SHALL be able to switch between listening mode and “not ready to listen” mode.

6.2.2 Requirements on identity

When a PoC subscriber receives the incoming PoC session invitation, he SHALL also receive the identity of the inviting PoC subscriber, in the form of user identity and, if provided, the display name. If the PoC subscriber’s identity is restricted, it SHALL NOT be provided in this case. The display name MAY be provided either by the inviting PoC subscriber or by the PoC service entity. The PoC service entity MAY replace the display name provided by the PoC subscriber. The PoC group identity SHALL also be given to the invited PoC subscriber.

The identity of the PoC participant who has been granted the floor, SHALL be distributed to all other PoC participants in the PoC session. If the PoC subscriber’s identity is restricted, it SHALL NOT be provided in this case. The PoC participant with

the grant floor SHALL be identified (when permitted) with his PoC subscriber identity and/or display name depending on the setting.

Each PoC participant SHALL be identified (when permitted) by an alphanumeric indication (e.g. MSISDN or SIP URI). Additionally, he SHALL be able to use his display name during his participation in the PoC session.

Each PoC group SHALL have a unique alphanumeric identifier (e.g. SIP URI) and MAY have a display name.

The PoC service entity SHOULD be able to support identifiers that use various alphabets (e.g. Arabic, Cyrillic, and Chinese).

6.2.3 Contact list

Each PoC subscriber SHOULD be able to create at least one list of other PoC subscribers and PoC groups which MAY easily be used to address the PoC subscribers or the PoC groups to whom he would like to speak.

In order to recover from loss or to manage change of the PoC client, it SHOULD be possible to store the backup copy of a contact list off the client.

To support the requirements for contact list, capabilities common to other OMA service enablers SHALL be leveraged, where possible and appropriate.

To provide functionality to manage PoC group session participation history:

- The PoC service entity SHOULD be able to provide PoC subscriber off-line access to session history information based on relevant information collected for charging purposes (Ref: Chapter 6.1.8 Charging)
- Examples of PoC session history available may include: group sessions participated, time stamps & durations, identities of participants.

6.2.4 Incoming Session Barring

In case a PoC subscriber does not want to be invited to any new PoC sessions, the PoC subscriber SHALL be able to activate a setting to reject all new incoming talk sessions. This action SHALL have no effect on the PoC subscriber's ability to send or receive talk bursts in PoC sessions, which he is participating in at the time it is performed. This action SHALL have no effect on the PoC subscriber's ability to send or receive instant personal alerts.

If a PoC subscriber tries to invite another PoC subscriber whose Incoming Session Barring setting is active, the inviting PoC subscriber SHALL receive an appropriate failure message.

6.2.5 Instant Personal Alert Barring

In case a PoC subscriber does not want to receive Instant Personal Alerts, the PoC subscriber MAY be able to activate a setting to reject all new incoming instant personal alerts. This action SHALL have no effect on the PoC subscriber's ability to send or receive talk bursts in PoC sessions.

If a PoC subscriber tries to send an instant personal alert to another PoC subscriber whose Instant Personal Alert Barring setting is active, the inviting PoC subscriber SHALL receive an appropriate failure message.

6.2.6 Presence Features

A PoC subscriber MAY have a set of Presence elements available to be published on his behalf. These features allow the PoC subscriber to express his Presence status. The PoC subscriber SHALL be able to manipulate his presence settings in accordance with applicable and appropriate Presence Service standards. The PoC subscriber MAY publish different presence information to other PoC subscribers, as determined by their privacy preferences.

This PoC service enabler SHALL not prevent operations of other Presence features based on applicable and appropriate Presence Standards when they are used in combination with PoC.

The PoC service enabler MAY communicate one or more of the following presence states:

- Do Not Disturb – New Incoming Session (Yes/No): Indicates whether the PoC subscriber is currently willing to accept new incoming PoC sessions. If the PoC subscriber activates the Incoming Session Barring (as described in Section 6.2.4) this element is set to indicate the subscriber's Incoming Session Barring setting.
- Do Not Disturb - Alerts (Yes/No): Indicates whether the PoC subscriber is currently willing to accept incoming instant personal alerts. If the PoC subscriber activates the Incoming Alert Barring setting (as described in Section 6.2.4) this element is set to indicate the subscriber's Incoming Alert Barring setting.
- Registered (True, False): Indicates whether the PoC subscriber is "registered" with the PoC service. When a PoC subscriber registers with the PoC service enabler, this presence element is set to "True". When the PoC subscriber's terminal is no longer registered (e.g. through expiration or removal of the registration), it is set to "False".
- Able to accept new incoming PoC Session (True, False): Indicates whether the PoC subscriber is able to accept a new incoming PoC session. When a PoC subscriber is able to accept new incoming PoC sessions, this presence element is set to "true". If for some reason the PoC subscriber is not able to accept new incoming PoC sessions (e.g. limit of concurrent PoC sessions is reached, terminal registration is removed, etc.) this presence element is set to 'false".
- Able to accept incoming instant personal alerts (True, False): Indicates whether the PoC subscriber is able to accept incoming instant personal alerts. When a PoC subscriber is able to accept incoming instant personal alerts, this presence element is set to "true". If for some reason the PoC subscriber is not able to accept incoming instant personal alerts this presence element is set to 'false".
- Currently in at least one PoC Session (True, False): Indicates whether the PoC subscriber is currently engaged in one or more PoC sessions. When a PoC subscriber engages in a PoC sessions, this presence element is set to "true". When a PoC subscriber's last PoC session is terminated, this presence element is set to "false".

Additional presence elements MAY also be communicated as defined in the relevant Presence enabler specification.

The PoC Service enabler SHALL ensure that the *optional* publication and/or subscription to the above attributes is done in a fashion that does not adversely impact network performance. The PoC Service enabler MAY do so by limiting the scope, frequency or recipients of such messages.

The non-communication of one or more of those presence elements SHALL not adversely impact the functionality of the PoC Service enabler.

Note that some of the above states are mutually exclusive. For example, a PoC subscriber would need to be "Registered" in order to be "Active in at least one PoC session".

6.2.7 Deactivate incoming talk-bursts

A PoC subscriber SHALL be able to deactivate and re-activate the incoming talk bursts of the ongoing PoC sessions.

6.2.8 Requirements on Service mobility

PoC subscriber SHALL be able to use the PoC service features with other PoC subscribers of the same PoC service provider.

PoC subscriber SHOULD be able to use the PoC service when roaming to another service provider's network subject to service providers' agreement.

6.2.9 Performance requirements

The first step for the service providers to offer a service with a satisfactory Quality of Experience (QoE) is to identify the underlying factors that impact QoE. QoE itself is highly subjective and very difficult to quantify and validate; whereas the

factors impacting on QoE can be objectively measured and validated against pre-determined target values. For Push to Talk service enabler, the following service characteristics are identified as the factors impacting QoE:

QoE1, Right-to-speak (RTS) response times during PoC session establishment: The duration between the times a PoC subscriber initiates a PoC session and when he receives a "right-to-speak" indication.

QoE2, Start-to-Speak (StS) response time after PoC session establishment: In a PoC session (1-to-1 or 1-to-many), the duration between the times a PoC participant initiates a floor request (i.e. permission to talk) and when he receives a "Start-to-speak" indication (or queuing indication or denial).

QoE3, End-to-end channel delay: The duration between the times one PoC participant, who has the right to speak, starts to speak and when another PoC participant starts to hear the speech (in case of 1-to-many sessions, each of the PoC participant's delay to another participant in the session must be measured).

QoE4, Voice quality: The following characteristics of the session directly impact the quality of the PoC speech:

- End-to-end channel delay
- Transmit and receive levels (loss plan as per telephony)
- Codec characteristics
- RF channel conditions
- Echo does not impact voice quality in PoC because of an absence of echo path in half-duplex operation.

These requirements in the following subsections in 6.2.7 refer to the case when a PoC session has been established among the PoC participants and is ready for voice communication.

6.2.9.1 Right-to-speak response times during PoC session establishment, QoE1

During PoC session establishment, the inviting subscriber receives 'right-to-speak' (RTS) indication after certain time depending on the answer mode setting of the invited PoC subscriber. If automatic answer is used, the right-to-speak indication can be given to the inviting PoC subscriber before the invited PoC subscriber is reached. If manual answer mode is used, the invited PoC subscriber has to accept the PoC session invitation before the 'right-to-speak' indication is given to the inviting PoC subscriber. Therefore, the following characteristics requirements are applicable:

- The duration between the times the inviting PoC subscriber initiates the PoC session and when he receives a "right-to-speak" indication SHOULD typically be less than [2.0] seconds, in case PoC service entity provides early "right-to-speak" indication and the invited PoC subscriber is on automatic answer mode.

- If the invited PoC subscriber answers manually, then the inviting PoC subscriber SHOULD typically receive the 'right-to-speak' indication in less than [1.6] seconds after the invited PoC subscriber manually accepts the PoC session invitation.

6.2.9.2 Start-to-Speak response time in an established PoC session, QoE2

Start-to-speak (StS) refers to the response period between the times the PoC participant requests talk permission to when he receives permission to start speaking in an established PoC session.

When a PoC participant makes a request to talk in the PoC session and his request is not queued, the StS time SHOULD typically be less than [1.6] seconds. If the PoC participant's request to talk is queued due to other PoC participants speaking or having already requested to speak, he SHOULD typically receive an indication within [1.6] seconds that his request has been queued.

If the PoC participant's request is rejected for any reason, he SHOULD typically receive an indication within [1.6] seconds that his request has been rejected.

6.2.9.3 End-to-end channel delay, QoE3

The voice delay time (duration between when voice is spoken by a sending PoC participant until it is heard by the invited PoC participant) SHOULD typically be no more than 1.6 seconds during the PoC session. This channel delay is a general

requirement for the talk-bursts, however for the first talk-burst in a PoC session set-up the voice delay SHOULD typically be no more than 4 seconds, in case early indication is given.

6.2.9.4 Voice quality requirements, QoE4

The PoC session voice quality SHOULD typically meet the following limit: `MOS >= 3 at BER <= 2%.`

6.2.9.5 Turnaround time (TaT)

TaT refers to the duration when a PoC participant stops talking and releases the floor to until he can hear another PoC participant beginning to speak. TaT comprises of system delay times plus the response/reaction time from another PoC participant. To allow a fluent communication between PoC participants, TaT response time SHALL be acceptably short. In case another PoC participant replies immediately (i.e. within 1-2 s), the TaT SHOULD typically be no longer than 4 seconds.

6.2.10 Duration of speaking

The PoC service provider SHALL be able to configure the maximum duration of speaking by PoC participants in a PoC session. If a maximum speaking duration is configured and a PoC participant speaking reaches the time limit, the PoC participant's right-to-speak SHALL be automatically revoked.

[The requirement(s) stated between this and the following tag is/are not implemented in this version of PoC,]
In the case of ad-hoc PoC groups, the PoC Host MAY preset a maximum speaking duration.
[The requirement(s) stated between this and the preceeding tag is/are not implemented in this version of PoC,]

If a maximum speaking duration is in effect, the speaking PoC participant SHALL be informed (e.g. by means of sound, flashing light or graphics) when the maximum speaking duration limit has been reached.

6.2.11 Multiple Group operation

Multiple group operation is an optional feature, the following requirements SHALL be met when this feature is implemented by the PoC service entity and PoC client. Also, service provider policy MAY apply before the PoC subscriber is authorised to use this feature:

- PoC subscriber SHALL be able to participate in more than one PoC group session at the same time.
- One of the PoC groups MAY be a primary PoC group and the rest of the PoC groups SHALL be secondary PoC groups.
- Primary PoC group communications SHALL have priority over secondary PoC group communication as defined in the following subsections.

6.2.11.1 Multiple group operation: no primary groups

- PoC subscriber SHALL be able to monitor multiple PoC group sessions.
- PoC subscriber SHALL start to hear traffic from any group where communication starts first.
- The PoC subscriber SHALL get an identification of the group session(s) in which traffic is being received.
- When the PoC subscriber wants to talk or listen into a group, he SHALL be able to select the group to which he wants to talk. Once a group has been selected, the PoC subscriber SHALL continue to hear traffic from that group until the discussion ends, or when he takes another action (e.g. deactivates talk-bursts or selects another group session for talking/listening). While talking or listening to the selected group session, he SHALL be able to continue monitoring the other group sessions.
- If there is traffic in more than one group session at the same time, there SHOULD be a means to filter the traffic so that the PoC subscriber only hears a single conversation at a time. Traffic from the selected group session SHALL have higher priority over traffic from the other groups being monitored. The affected participants whose talk-bursts are being filtered SHOULD not be notified.

- When the PoC subscriber is talking, his transmission SHALL not be interrupted because of traffic arriving in another group session, i.e. transmission SHALL have higher priority than reception, but he SHOULD receive an indication in the event that there is traffic on another PoC session.

6.2.11.2 Multiple group operation: one primary group and secondary group(s)

In case the PoC subscriber has a primary group and secondary group(s), the following requirements are applicable:

- If there is no traffic in the primary group, the PoC subscriber SHALL receive traffic from secondary groups according to all the requirements described in Chapter 6.2.9.1.
- If there is traffic in the primary group, the following conditions apply:
    - Traffic in the primary group SHALL always have higher priority than traffic in any secondary group. As soon as speech from the primary group arrives, it SHALL be heard immediately, even if the PoC subscriber was receiving speech in a secondary group.
    - When the PoC subscriber is talking on a secondary group, he SHALL NOT hear any traffic from the primary group. His transmission to the secondary group SHALL NOT be affected by traffic on the primary group, but he SHOULD receive an indication in the event that there is traffic on the primary PoC group.
    - As long as there is traffic in the primary group, the PoC subscriber SHALL continue hearing it, until the discussion has ended, or when he takes another action (e.g. deactivates talk-bursts or selects another group session for talking/listening). While talking or listening to the primary group, he SHOULD be able to continue monitoring the other group sessions.
- When the user wants to talk or listen into a group, it SHALL be possible to have the primary group as the default selected target.
- The user MAY be able to change his/her primary group.

6.2.12 Separate 1-to-1 PoC session while having a PoC session

Separate 1-to-1 PoC session during other PoC sessions is an optional feature, the following requirements SHALL be met when this feature is implemented by the PoC service entity and PoC client. Also, service provider policy MAY apply before the PoC subscriber is authorised to use this feature:

- A PoC subscriber who participates in a PoC session (1-to-1 or 1-to-many) SHALL be able to initiate and conduct a separate 1-to-1 PoC session with any other PoC subscriber. In the case where the *invited* subscriber is in a 1-to-many session, the second session MAY be established to a participant of the same or different group.
- A PoC subscriber of an ongoing PoC session (1-to-1 or 1-to-many) SHALL be able to receive separate 1-to-1 PoC session communications from any other PoC subscriber. In the case where the *inviting* subscriber is in a 1-to-many session, the second session MAY be received from a participant of the same or different group.
- The separate 1-to-1 PoC session by a PoC group participant SHALL NOT affect in any way the existing communications between other PoC group participants.
- The 1-to-1 PoC participants SHALL NOT receive speech from the previous session communication while sending or receiving speech from a separate 1-to-1 PoC session.
- An implementation MAY prevent the 1-to-1 PoC participants from hearing the previous session communications during the entire 1-to-1 PoC session.
- The first PoC session SHALL be suspended (i.e. the PoC subscriber SHALL NOT be able to hear/transmit any talk bursts from/to the first PoC session) while the PoC subscriber is engaged in the second PoC session, and SHALL be automatically resumed when the second PoC session is terminated, provided that the other PoC session has not been terminated in the meantime.

- The PoC group participant information MAY be updated, when the first session is suspended and again when it is resumed.
- PoC participant SHALL be able to receive 1-to-1 PoC sessions while taking part in a PoC session.
- PoC participant SHALL be able to control the automatic acceptance of 1-to-1 PoC sessions while in a PoC session.

6.2.13 Manual Answer Override

Manual Answer Override is an optional feature, the following requirements SHALL be met when this feature is implemented by the PoC service entity and PoC client. Also, service provider policy MAY apply before the PoC subscriber is authorised to use this feature:

The manual answer override feature supports a means for an inviting PoC subscriber to override an invited PoC subscribers manual answer settings. By using this feature, an authorised PoC Subscriber MAY be able to request the overriding of another PoC subscriber's manual answer preference, i.e. the inviting PoC subscriber's speech is immediately audible at the invited PoC subscriber's terminal without any action by the invited PoC subscriber.

A PoC Service enabler that supports this feature SHALL:

- Provide means to ensure that any PoC subscriber using this feature has previously been authorised to do so on be half of the invited PoC subscriber.
- Authorisation to use the manual override service SHALL be verified each time the service is invoked.
- If use of the feature is authorised then the Inviting subscriber's speech SHALL be immediately audible at the invited PoC subscribers terminal, except in the following circumstances:
    - The network operator has blocked access.
    - The invited PoC subscriber is not connected.
    - In emergency situations, the service provider SHALL be able to administratively allow one of more PoC subscribers to the override the PoC sessions.
- If use of the feature is authorised but the initiation of the session cannot be completed for any of the reasons listed above, the inviting PoC subscriber SHALL be notified accordingly, possibly with the reason for failure.
- If use of the feature is not authorised, the inviting PoC subscriber SHALL be notified accordingly.
- A PoC subscriber who is authorised to use this feature MAY be able to select it on a session-by-session basis.

6.3 Overall System Requirements

The general network attributes & behaviours specified in this chapter are supported in the PoC architecture design:

6.3.1 Open Interfaces

Interfaces to the PoC service entities SHALL make use of open standards. Specifically, it SHALL be possible to make use of relevant network interface standards from 3GPP and 3GPP2.

6.3.2 Interoperability between PoC Service Providers & Service Entities

It SHALL be possible for PoC participants to seamlessly interact with each other within a PoC session (i.e. 1-to-1 and group sessions) regardless of their PoC service providers.

PoC subscribers SHALL be able to seamlessly utilise PoC features involving other PoC subscribers regardless of their PoC service provider. For example, a PoC group session served by one service provider's PoC service entity MAY include PoC participants who are subscribers of another PoC service provider.

An appropriate interface SHOULD be provided between the PoC service entities of different PoC service providers that are interconnected to allow the service providers to manage the set-up, monitoring, maintenance and termination of PoC sessions and PoC groups regardless of the PoC participant's PoC service provider.

6.3.3 Inter-working with fixed connections

PoC service entity MAY inter-work with the fixed IP network Instant Messaging (IM) services with enhanced streaming audio functionality. This may enable a substantial extension to PoC coverage for both PoC and IM users. However, PoC inter-working with traditional voice services (whether implemented on circuit switched or packet switched technology is out-of-scope). Protocols to support such inter-working are not part of the PoC features.

6.3.4 Cross Services Interoperability

PoC service entity MAY inter-work with other standalone and/or integrated messaging services, but is currently out-of-scope. For example, protocols to support such inter-working are not part of the PoC feature, although messaging services may create such inter-working by adding the necessary PoC protocols and interfaces.

6.3.5 Interaction with Circuit Switched Call Mode residing on the terminal

In the near term, it is highly probable that a PoC service will be added to a mobile terminal capable of Circuit Switched (CS) voice communications. In this case, both the PoC service and CS voice service modes are collocated in the terminal, but inter-working between these services is not supported. However, to maintain usability of these services when collocated on a terminal, some means for the user to change between these service modes SHALL be possible, which may involve both the PoC service entity and/or the client.

- If a CS call is ongoing, any incoming PoC session SHOULD be indicated.
- If a PoC session is ongoing, any incoming CS call SHOULD initiate alerting.
- The PoC subscriber SHOULD be able to switch between CS and PoC sessions if needed maintaining session context for the non-active call/session.

6.3.6 Roaming Service Support

A PoC subscriber while roaming SHALL be able to access the PoC service (e.g. initiate or respond to a PoC session request) either as an individual or a PoC group session participant.

The visited network SHALL be "transparent" and provide unrestricted PoC subscriber access to his home network PoC service. The PoC subscriber SHOULD be able to access all the features of his normal home based PoC service.

It SHALL be possible to limit some PoC capabilities, while a PoC subscriber is roaming, by the PoC subscriber's preferences or through PoC service provider provisioning (e.g. 1-to-separate PoC session or multiple group operation may be restricted).

6.3.7 Presence Feature Settings

If Presence features are supported by the PoC service entity, a PoC subscriber SHALL be able to indicate his Presence conditions (e.g. Do-Not-Disturb or Unavailable). Consistent with Chapter 6.3.3, interworking between Presence services (as part of PoC service features) and traditional voice services is out-of-scope. Protocols to support such inter-working are not part of the PoC features.

6.4 System Elements

This section contains high-level requirements on the basic functionality required by each of the identified system elements supporting PoC. The PoC client interacts with the PoC application service infrastructure to establish PoC sessions. The PoC application service infrastructure SHALL coordinate a reliable half-duplex PoC session initiated by the PoC session originator and other PoC participant(s).

Note that the requirements in this section do not assume any PoC architecture in particular. The intention is to capture requirements on the functionality related to the PoC client and service infrastructure. Actual system elements are not specified.

6.4.1 User Equipment

- The PoC enabled user equipment (UE) SHALL support functions to set up the PoC session, and request the floor and release the floor.
- The PoC UE SHALL support a function to manually exit the PoC session.
- PoC UE SHALL support functions (e.g. tones) to announce an incoming PoC session, and to properly arbitrate the use of the half duplex PoC session (e.g. talk-proceed, floor open, floor rejected).

6.4.2 PoC Client

The PoC Client SHALL be able to:

- Allow PoC session initiation, (e.g. codec negotiation), participation (e.g., talk or listen), and termination.
- Perform registration with the PoC Application Service Infrastructure.
- Participate in authentication with the PoC Application Service Infrastructure.
- Provide access to different PoC group lists in the PoC Application Service Infrastructure (e.g. contact lists, group lists).
- Generate talk bursts for transmission when the PoC function is invoked and reproduce received talk bursts when the PoC function is not invoked.
- Support floor control procedures (e.g. make requests and respond to commands).
- Incorporate PoC configuration data downloaded by the PoC Application Service Infrastructure (e.g. over-the-air activation).

The PoC Client MAY:

- Provide access to PoC subscriber for managing PoC group lists.

- Provide access to PoC service entity on Presence conditions of the PoC subscriber.

6.4.3 PoC Application Service Infrastructure

The PoC Application Service Infrastructure SHALL be able to:

- Support session initiation requests from PoC Clients.
- Allow participation in and termination of PoC sessions.
- Service registration requests from PoC Clients.
- Participate in authentication with PoC Clients.
- Negotiate the capabilities of the PoC client to be used in the PoC session.
- Allow PoC Clients to access different PoC group lists (e.g. contact lists or group lists).
- Forward talk bursts from the speaker towards designated PoC Clients.
- Support floor control.
- Dynamically add and remove PoC group members during an active PoC session.
- Generate CDRs.
- Control access to the PoC session.
- Support Lawful Interception.
- Perform authorization of PoC clients.
- Provision PoC service parameters (and user profiles, etc.) for PoC subscribers; and
- Store and access PoC group membership information.

The PoC Application Service Infrastructure MAY be able to:

- Allow the PoC Client to manage lists.
- Provide a means to inform PoC subscribers of the presence and availability of group members; and
- Interact with other service enabling platforms.

6.4.4 Network interfaces

6.4.4.1 Interface Between PoC Client and PoC Application Service Infrastructure

Interfaces between the PoC Client and PoC Application Service Infrastructure MUST:

- Be supported by Mobile Packet Switched Data Networks (e.g. those defined by 3GPP and 3GPP2).
- Support secure transportation of PoC talk-bursts.
- Support secure signalling and communication connections.
- Support the requirements of performance related signalling protocols (e.g. floor control).
- Support functions related to PoC session initiation, registration, participation and termination.
- Support authentication of PoC Clients/PoC Application Service Infrastructure.
- Support authorization of PoC Clients.
- Support an administration interface to allow PoC subscribers to update PoC group lists and contacts lists.

- Support secure provisioning of PoC service parameters and features.

6.4.4.2 Interface Between PoC Application Service Infrastructure and Presence Enabler

An interface between the PoC application service infrastructure and a Presence service enabler MAY be provided to inform PoC participants of the presence and availability of PoC group members.

To support the requirements for Presence features, capabilities common to other OMA service enablers SHALL be leveraged, where possible and appropriate to provide a unified experience to the PoC subscriber.

6.4.4.3 Interface Between PoC Application Service Infrastructure and OAM&P

The PoC application service infrastructure SHOULD be able to utilize standards based interface capabilities that allow integration with the service provider's Operations, Administration, Management and Provisioning (OAM&P) systems.

6.4.4.4 Interface Between PoC Application Service Infrastructures in Different Service Provider Domains

The PoC application service infrastructure SHALL be able to connect to PoC application service infrastructures in different service provider domains.

6.4.4.5 Interface Between PoC Application Service Infrastructure and Law Enforcement Agency

Access to intercepted PoC communications SHALL be possible, as required by law enforcement agencies.

6.4.4.6 Interface Between PoC Application Service Infrastructure and PoC Group/List Management

To support the requirements for PoC Group/List Management, capabilities common to other OMA service enablers SHALL be leveraged, where possible and appropriate to provide a unified experience to the PoC subscriber.

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior version

A.2 Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
OMA-RD_PoC-V1_0	13 Oct 2003	n/a	Apply new approved templet version to the requirements document. Same content as in the version from 8th of October 2003.
	15 Oct 2003	6.1.2.1 6.1.6.8 6.2.5	Chapter 6.1.2.1 on Floor Control ; OMA-REQ-2003-0539R02 Chapter 6.1.6.8 on globa settings; OMA-REQ-2003-0667 Chapter 6.2.5 on bar incoming talk burst; common agreement
	29 Oct 2003	n/a	"many chapters"
	02 Nov 2003	6.1.4 6.1.4 6.2.4 6.2.7 6.2.11 6.2.13	Chapter 6.1.4 on Instant Personal Alert, OMA-2003-0668R03 Chapter 6.1.4 on incoming requests, OMA-2003-0684R01 Chapter 6.2.4 on Presence features, OMA-REQ-2003-0631R02 Chapter 6.2.7 on voice delay, OMA-2003-0693 Chapter 6.2.11 on Whisper; OMA-REQ-2003-0700 Chapter 6.2.13 on Manual Answer Override, OMA-REQ-2003-0698R02 "many chapters", OMA-REQ-2003-0697R01
	10 Nov 2003	5.10 3, 4.1, 6.1. and 6.2 6.1.1 and 6.1.7.7	Chapter 5.10 (new use case) and 6.1 additional high level requirenments, OMA-2003-066R02. Chapter 3, 4.1, 6.1. and 6.2.: clarifications of editors notes as proposed by the editor. Chapter 6.1.1 and 6.1.7.7 editorial changes proposed by the editor.
	11 Nov 2003	n/a	Outcome of the REQ POC face-2-face meeting
	24 Nov 2003	n/a	Based on changes proposed in input contribution OMA-REQ-2003-0798-PoC
	28 Nov 2003	6.1.3 6.1.2, 6.1.5.2, 6.1.5.3 6.2.7.3 4.1, 6.1.8	Chapter 6.1.3. Instant Personal Alert, OMA-REQ-2003-0800 Chapter 6.1.2, 6.1.5.2, 6.1.5.3, OMA-REQ-2003-0801 Chapter 6.2.7.3. e-2-e delay, OMA-REQ-2003-0802 Plus changes agreed at the OMA REQ PoC Conf call, 2003-11-24 (chapter 4.1 and 6.1.8) Remove 6.4.1.1 and corrections in the numbering in chapter 6.4.4
	03 Dec 2003		OMA-REQ-2003-0710R03, use case only OMA-REQ-2003-0810, OMA-REQ-2003-0812, OMA-REQ-2003-0813, OMA-REQ-2003-0814, OMA-REQ-2003-0815, most but not everything OMA-REQ-2003-0816, OMA-REQ-2003-0820R01
	03 Dec 2003	n/a	Clean version of OMA-RD_PoC-V1_0-20031203-D

Document Identifier	Date	Sections	Description
	25 Jan 2004	n/a	General update of OMA-RD_PoC-V1_0-20031204-D based on comments resolution as documented in the RD Review Report OMA-REQ-2003-0840R05 (25 Jan 2004). Porposed texts and modifications from the following input contributions were discussed, agreed and edited for inclusion as part of the RDRR resolution: OMA-REQ-2003-0848 OMA-REQ-2003-0849 OMA-REQ-2003-0850 OMA-REQ-2003-0852 OMA-REQ-2003-0854 R02 OMA-REQ-2003-0855 OMA-REQ-2003-0856 OMA-REQ-2003-0861 OMA-REQ-2003-0870 OMA-REQ-2004-0019 OMA-REQ-2004-0020 OMA-REQ-2004-0025 OMA-REQ-2004-0029 OMA-REQ-2004-0051 OMA-REQ-2004-0053R02 OMA-REQ-2004-0054R02 OMA-REQ-2004-0056 OMA-REQ-2004-0062 OMA-REQ-2004-0071 Appendix re Undeveloped Use Cases removed.
	25 Jan 2004	n/a	Incorporation of review comments: RDRR #016 RDRR #038 RDRR #095 RDRR #149 RDRR #173 Constency changes for unrestricted and restricted group terminology, Constancy changes for PoC administrator and group administrator.
	31 Jan 2004	6.2.9.2 6.1.5.2 6.24.4 6.1.2 6.1.5.2 6.1.5.6	Chaper 6.2.9.2 re-edited as per agreed changes in RDRR version 6 (dated 29 Jan 2004) Comment #190. Chapter 6.1.5.2 corrected to reflect RDRR Comment #106. OMA-REQ-2004-0111: Chapter 6.2.4.4 qualifications for "Unavailable" presence indications added. OMA-REQ-2004-0112: Chapter 6.1.2 Attributes for Ad-hoc groups, 3rd bullet deleted. Chapter 6.1.5.2 clarified as for unrestricted chat group sessions. Chapter 6.1.5.6 was clarified as applicable to pre-arranged and ad-hoc group sessoins only. "Unavailable" indications qualifications added
Candidate Versions OMA-RD_PoC-V1_0	05 Feb 2004	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2004-0065-PoC-RD-Package-for-Approval.zip
	12 Feb 2004	3.2 6.1.15	OMA-REQ-2004-0185R01-PoC-inter-working Add the definition of "corporate PoC system" and add the condition of commercial agreements into the interworking chapter.
	15 April 2004	6.1	OMA-REQ-2004-0183R02-PoC-subscriber-addressing Change "PoC terminal" to "PoC user"
	25 April 2004	6.2.4	OMA-REQ-2004-0407R01-CR_POC-Presence-States-Fix Replace the current 6.2.4 with simplified text
	30 April 2004	6.2.11.2	OMA-REQ-2004-0458-CR-on-PoC-talk-bust-interrupt-requirements Clarify the user experience for the situation when a user is speaking on a secondary group and traffic occurs on a primary group.
	03 June 2004	6.2.6	OMA-REQ-2004-0439R02-CR_POC-Presence-States-Fix-2 Add and clarify behaviour of Presence features

Document Identifier	Date	Sections	Description
	13 June 2004	6.1.5.1	OMA-REQ-2004-0596-POC-Removal-of-Queued-Identity Removal of the option to enable a PoC participant who has requested the floor to obtain the identity and position of other PoC participants in the floor request queue.
	28 Aug 2004	6.1.9.6	OMA-REQ-2004-0752R02-CR-AnswerMode Correction in the autoanswer and manual answer requirements.
	28. Oct 2004	2.1 6.1 6.1.2 6.1.3 6.1.5.3 6.3.7	OMA-REQ-2004-0950R01-PoC-Rel-1.0-RD-Enhancements-and-Corrections The purpose of the CR is to clarify the handset and the server mandatory and optional role. Without this clarification, it is ambiguous PoC network element functional role and can lead to mistake on the generation of the Enabler Test Requirements and Enabler Test Specification. In addition, there are other editorial corrections.
	28. Oct 2004	Appendix A	Document history aligned to the current OMA specification template OMA-Template-Spec-20040205
Candidate Version OMA-RD-PoC-V1_0	04 Feb 2005	2, 6, Appendix B	OMA-TP-2005-0073-LATE-Changes-to-the-PoC-RD Changes resulting out of the PoC consistency revive Replace "_" with " –" in the document name to comply with the OMA Process Document.
OMA-RD-PoC-V1_0	29 Mar 2005	4 Appendix B	Correcting the application of : OMA-TP-2005-0073-LATE-Changes-to-the-PoC-RD First line of Section 4 replaced. Changes to Appendix B implemented.

Appendix B. – Overview of Pre-arranged, Ad-hoc and Chat PoC Groups (Informative)

The table below provides a concise overview of the differences between PoC Group (either pre-arranged or ad-hoc) sessions and Chat PoC Group session:

Characteristic	Ad-hoc and Pre-arranged PoC Group Session	Chat PoC Group Session
Setup	Setup is initiated by a PoC group member. The group of PoC subscribers identified by the initiating PoC subscriber may be a pre-arranged PoC group, or an ad hoc PoC group.	Setup is initiated by a PoC group member or the service provider. The initiating PoC subscriber may specify that the Chat PoC Group session is limited to members of a specific administrated group or groups. The initiating PoC subscriber may also specify that the Chat PoC Group is open to all PoC subscribers.
Session Name	The PoC System will apply the name of the group to the new group session, unless one is supplied by the initiating PoC subscriber.	The initiating PoC subscriber must specify a name for the Chat PoC Group.
Alerts to PoC group members	Alerts are automatically sent to all PoC group members except those having successfully applied a Do-Not-Disturb presence status	Alerts are not automatically sent. PoC subscribers must query the list of available Chat PoC Groups and manually select to join the Chat Group. PoC subscribers may notify other PoC subscribers of available Chat PoC Groups.
Floor Control	Standard PoC floor control procedures apply, i.e., half-duplex walkie-talkie style communication.	Standard PoC floor control procedures apply, i.e., half-duplex walkie-talkie style communication.
Termination	The Group session is terminated explicitly by one of the PoC participants who has PoC Host status for the group session. It may also be terminated implicitly as the second last participant leaves the PoC session. Finally, it may be administratively terminated by a PoC group administrator or by the service provider.	A Chat PoC Group may be administratively terminated by a PoC group administrator or by the service provider. A Chat PoC Group may have a termination time assigned to it. The Chat PoC Group may also be configured to terminate when the initiating PoC participant leaves the session.

Appendix C. - Terminal User Interface (Informative)

The following requirments pertaining to PoC terminal and user–interface arequirements are considered out-of-scope of the PoC service enabler. This informative requirements are captured herein as issues for terminal design and development considerations in support of the PoC subscriber services.

- Some activator mechanism (e.g. a dedicated button) may be required on the terminal for activating the PoC function. In the absence of such an activator, there should be an alternative method defined to activate the PoC function (e.g. using certain terminal keypad sequence, soft keys or touch screen action). As an option, more one PoC activator may be defined for multiple group operations.
- Loud Speaker capability should be provided on the terminal. If present, it should be possible to switch the loud speaker on/off and to regulate its audio volume.
- Where applicable, the name, display name, number or public user identities of the invited PoC subscriber or active PoC groups should be indicated in the display. The user should be able to define what identity is displayed on the terminal.
- While in PoC mode, the user should have easy access to persons and groups he wishes to communicate with. Both keypad and contact list display may be used for person/group selection.
- To support Priority sessions, a dedicated activator (e.g. a button or some other mechanism) on the terminal may be configured as "priority" PoC session function. The destination of the priority session may be pre-programmed and should be password protected, or may be chosen from the contact list.
- The owner of a PoC device should be able to prohibit the use of PoC chats for the decvice.
- Buffering of voice packets for the PoC session may be supported at the terminal.